A Profile of Social Connectedness in Older Adults

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FOREWORD

Loneliness has been associated with increased mortality and a range of adverse health outcomes that are both prevalent and costly in older age. Loneliness, however, is often a hidden problem. It has few clear outward indicators, some degree of stigma attached, and no proven solutions beyond conventional wisdom about trying to make friends and find meaningful pursuits and activities.

This report, developed with AARP Foundation support, examines the best existing data to estimate frequency of loneliness among older adults in the U.S., as well as to identify both the characteristics of lonely older adults and the segments of the older adult population who are at high risk for loneliness.

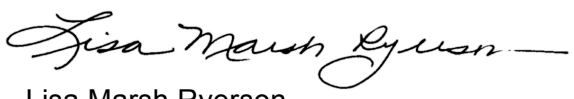
It is important to note that loneliness and isolation, although closely related, are not the same thing. We can't confuse social isolation — an **objective** lack of social networks and access to information and resources — with the **subjective** condition of loneliness. Both are critical and require our sustained attention. The scope of this report is specific to loneliness in adults age 62–91.

Loneliness and isolation in older adults are fairly new research topics. What data there is indicates that these conditions lead to dramatic decreases in physical health, mental well-being and overall quality of life. More research is needed to fully address this growing — and often invisible — public health threat.

It is crucial that we identify who is at risk or already suffering in order to develop effective strategies that meet older adults' need for social connection. Any new research should include examining the incidence and effects of loneliness and social isolation on groups that are often marginalized.

Through research and ongoing collaboration, AARP Foundation is working to create a deeper understanding of loneliness and isolation, draw much-needed attention to these issues and catalyze action.

With warm regards,



Lisa Marsh Ryerson
President, AARP Foundation

EXECUTIVE SUMMARY

This report examines the social connectedness of older adults in the United States. Social connectedness is here defined as satisfaction and contentment with one's social life. Its opposite, loneliness, is defined as dissatisfaction with the quantity or quality of one's social relationships. Social isolation, or being alone, is related to loneliness but is not the same as feeling alone, which we call loneliness.

Loneliness, in addition to making people's lives miserable, has been associated with increased mortality and a range of adverse physiological and health outcomes that are prevalent and costly in older age. The scope of the problem is related to the prevalence of loneliness in older adults in the USA, and current estimates of prevalence are not yet available. Relatively recent data are available, however, and this report uses those data to estimate prevalence. Moreover, characteristics of lonely older adults are not well understood, and segments of the current older adult population who are at high risk for loneliness have not been identified. This report addresses these issues.

Data derive from the National Social Life, Health and Aging Project (NSHAP), a panel study funded by the National Institutes of Aging (NIA) in which a population-based sample of 3,240 older adults was surveyed in 2010 when participants were 62–91 years of age. Results showed that 19% of older adults in the United States suffer from loneliness; 8% of older adults often feel lonely, and 11% feel lonely at least some of the time.

Socioeconomic and demographic characteristics differ between the socially connected group and the lonely group, as do health, social engagement, social network characteristics, and positive and negative qualities of relationships. Relative to the socially connected group, the lonely group has lower household income and less wealth, is less likely to be married, and lives alone. The lonely group also has poorer self-rated health, more physical limitations in carrying out the activities of daily living, and fewer friends. They socialize, volunteer, attend religious services, and participate in organized groups less frequently than the socially connected group. In addition, the lonely group reports less support and greater strain in their relationships with family and friends.

Data about the older population in general can be used to identify which individuals may be at particular risk for loneliness. In this nationally representative sample of older adults, the risk of loneliness is higher for those who do not have a spouse or partner, socialize less frequently, have fewer friends, or experience greater strain in family relationships. Having information on these four aspects of older adults' lives significantly increases the likelihood that individuals can be identified as either lonely or socially connected.

The ability to predict which individuals are lonely or socially connected can be further improved by considering married and unmarried older adults separately, in part because the married and unmarried groups differ in more ways than marital status. For instance, married older adults are more likely to have a higher income than those who are not married. When examined separately, 14% of married older adults and 30% of unmarried older adults fall into the lonely group. Married women are at higher risk of loneliness than married men, but unmarried women are at lower risk of loneliness than unmarried men. In addition, the subgroup most at risk of loneliness among married older adults includes those who have lower income, attend religious

services relatively infrequently, and experience poor marital quality. Among unmarried older adults, the most at-risk subgroup includes those who have more physical limitations, fewer friends, and greater strain in their family relationships.

It is important to note that some of the risk factors for loneliness are also consequences of loneliness. For instance, loneliness is reciprocally related to physical limitations; not only are people with physical limitations more likely to experience the onset of loneliness or increase in its frequency, but loneliness also predicts an increase in functional limitations over time (Luo, Hawkley, Waite, & Cacioppo, 2012). Similarly, strain in family relationships can lead to feelings of loneliness, but loneliness can also make a person an unpleasant interaction partner, thereby increasing strain in relationships. These issues are not addressed further in this report, but draw attention to the need for longitudinal research to untangle the temporal ordering that links loneliness and its various causes and consequences.

In sum, although most older adults in the USA are socially connected and seemingly resilient to the losses that come with aging, a sizeable portion of this population feels lonely. Data identified segments of the population that may be at particularly high risk of loneliness. This information may be useful in setting directions for future research, targeting policies, and helping service agencies reduce the burden of loneliness in a growing older adult population.

INTRODUCTION

Social relationships are important to quality of life across the lifespan, and can bestow life with meaning, purpose, and a general sense of well-being. Conversely, the loss or deterioration of important relationships to death, poor physical or cognitive health, or geographic relocation take a toll on well-being. Older adults are especially likely to experience age-related losses that affect their social relationships. Are older adults socially resilient? Do they manage to find contentment with their social life despite the losses and challenge that accompany older age?

One way of determining whether individuals are content with their social life is to assess how lonely they feel. Loneliness is the distressing feeling people experience when their social needs are not satisfied, either in number of social ties, frequency of interactions, or quality of relationships. Loneliness is not the same as being socially isolated or alone. Some people live relatively solitary lives and do not feel lonely, while even those with an active social life can feel lonely. On the whole, however, deficits in social relationships and frequencies of social interactions and activities increase vulnerability to feelings of loneliness. Although number of relationships matters to some extent, the quality of the relationships matters even more. Loneliness can be measured by simply asking people how lonely they feel, but the stigma associated with admitting loneliness can bias responses. An alternate validated strategy used in this study is to ask people how often they feel isolated, left out, and lacking in companionship.

Recent research has highlighted the dangers of an impoverished social life and the adverse consequences of poor social relationships and loneliness in older age (Holt-Lunstad et al., 2010). Loneliness has been associated with earlier mortality (Holt-Lunstad et al., 2015), larger age-related increases in blood pressure, increases in depressive symptoms, worsening of sleep quality, altered regulation of the cortisol stress system, and greater cognitive decline (reviewed in Cacioppo & Cacioppo, 2014; Hawkley & Cacioppo, 2010). Preventing and reducing loneliness could not only benefit the health and well-being of older adults, but could also have economic implications for a society with a rapidly growing older adult population. The current scope of the problem of loneliness in older adults is largely unknown, however.

The present report (1) estimates the frequency and prevalence of loneliness, (2) characterizes how lonely individuals differ from socially connected older adults, and (3) identifies unique factors that indicate the segments of the older adult population that are at particular risk for loneliness. The data derive from the National Social Life, Health and Aging Project (NSHAP), a panel study of a population-based representative sample of community-dwelling older adults in the United States and funded by the National Institute on Aging. Respondents were first interviewed in 2005 at 57–85 years of age, and then again in 2010. Spouses and cohabiting partners of primary respondents were added to the sample in 2010, resulting in a final age-eligible sample of 3,240 adults age 62–91.

KEY FINDINGS

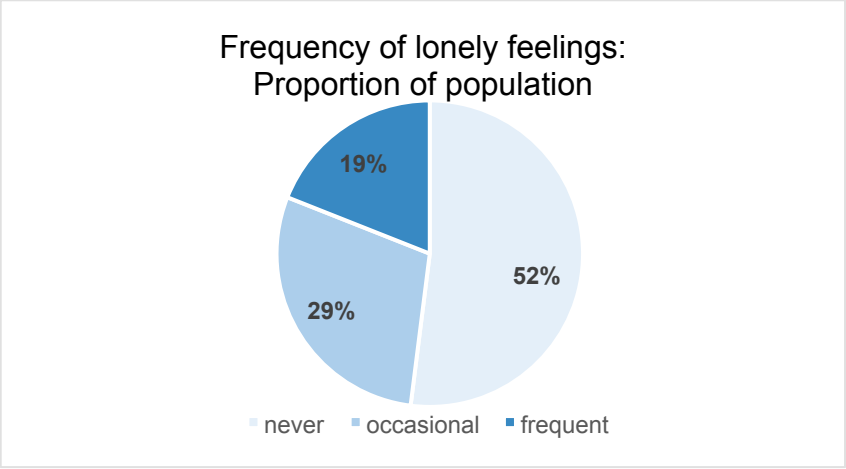
The NSHAP sample is described in Table 1 (see Appendix) for each of the variables considered in subsequent analyses. Briefly, the sample has a mean age of 72.2 years, roughly half are female (52.6%), most are white (81.4%), most are married (63.5%) or widowed (21.4%), and most are retired (65.7%). They rate their health as good to very good, and most report no limitations to everyday activities (67.2%). They are fairly socially active, with roughly half the sample reporting at least weekly socializing with friends and attending religious services. Respondents report better than average support from family members and friends, and married respondents report high levels of spousal support and marital satisfaction. Strain in social relationships is low overall, but strain increases with increasing relational closeness; spousal strain is highest, followed by family strain and then strain in friendships.

NSHAP is a representative sample of the U.S. population as a whole, and survey weights allow us to generalize findings to the population. Further research could focus on the low-income group within this sample to determine whether loneliness arises in this group for different reasons than those seen in the higher income group.

How frequent and prevalent is loneliness in older adults?

Respondents indicated how often they felt isolated, left out, and lacking in companionship by choosing among the options never, hardly ever, some of the time, and often. These options were assigned numeric values such that never and hardly ever were assigned a “0,” some of time was assigned a “1,” and often was assigned a “2.” Responses to all three questions were then summed to create a score that ranged from 0 to 6. On average, older adults score a low value of 1.1 on the loneliness scale, indicating that, on average, they feel lonely infrequently.

In terms of prevalence, over half of the population (52%) report never feeling lonely (value of 0) and can be considered socially connected. Another 29% experience only occasional loneliness (values of 1 or 2), but 19% report relatively frequent loneliness (values of 3 or more). It is this latter group that we profile in the following section of the report.



19% of Americans age 62–91 are lonely.

How do lonely and non-lonely older adults differ?

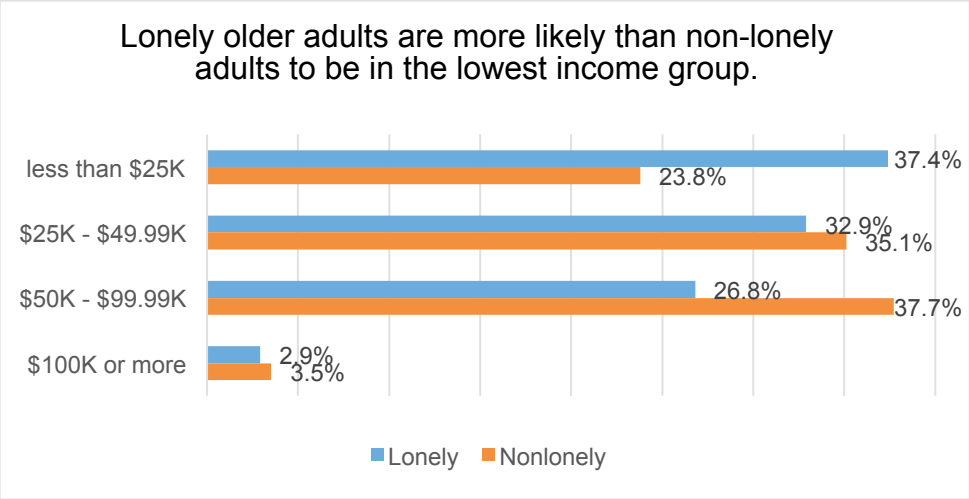
Differences between the lonely and non-lonely groups across a range of characteristics are summarized in Table 2 (see Appendix) and discussed below.

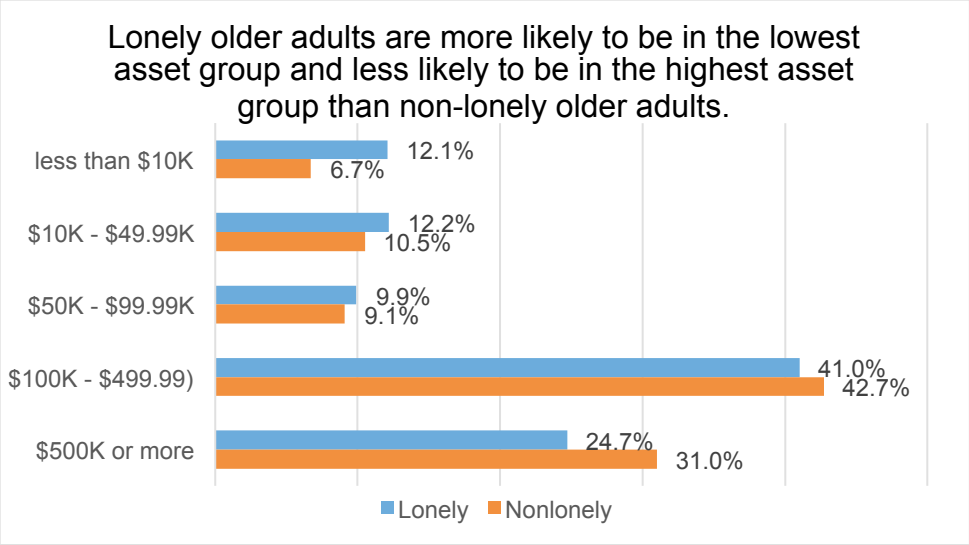
Demographics

It is informative to note that basic demographic variables do NOT differentiate between the lonely and non-lonely groups. Loneliness is not significantly more prevalent in the oldest old adults, nor in minority groups relative to whites, nor in women relative to men (58% of women versus 52% of men).

Socioeconomic Status

Education levels do not differ between the groups. Household income and assets, on the other hand, differ markedly between groups such that, relative to the non-lonely group, the lonely group is significantly more likely to have an annual household income of less than $25,000 (37% vs. 24%) and assets less than $10,000 (12% vs. 7%). In turn, the lonely group is less likely than the socially connected group to have a higher income (i.e., $50,000 to $99,999) and to have assets that exceed $500,000.

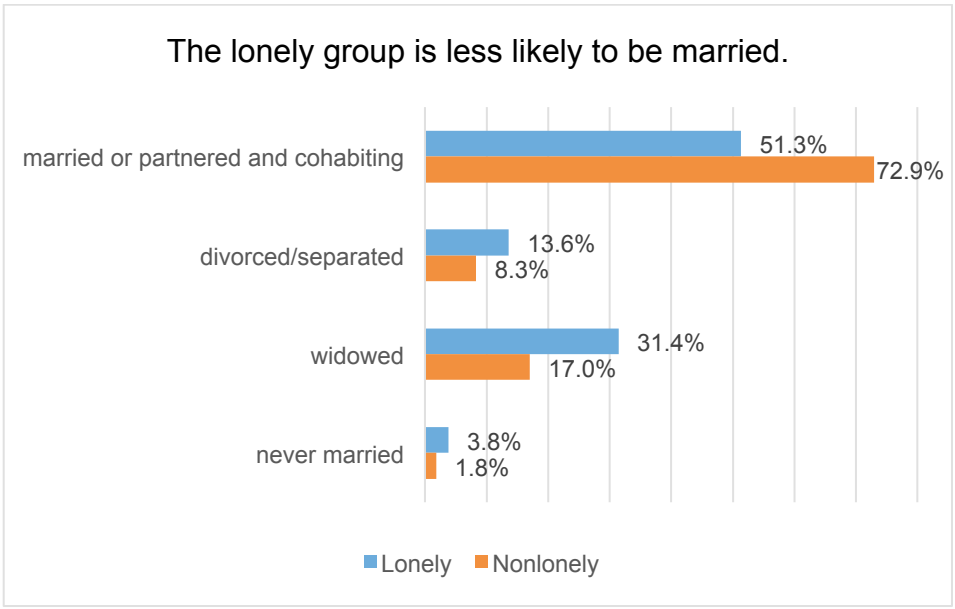




Social Roles and Circumstances

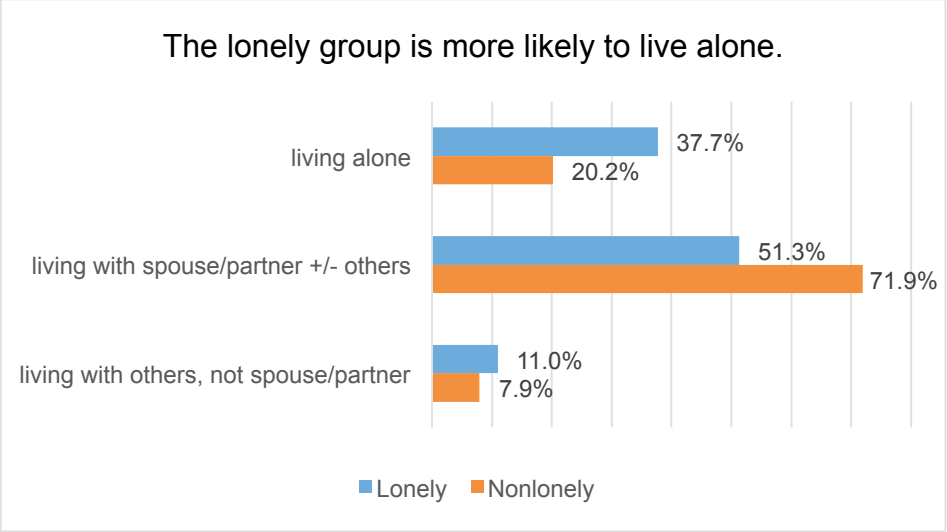
Lonely and non-lonely older adults are equally likely to be retired, working, some combination of retired and working, or disabled or unemployed. The two groups do not differ in the proportion that are primary caregivers who spend at least 20 hours a week caring for a dependent, typically a spouse.[1]

Marital status differs markedly between the two groups, however. Given the well-established protective effects of marriage on loneliness, it is not surprising that the lonely group is far less likely to be married (51% versus 73%) and more likely to be divorced, separated, or widowed than the non-lonely group.



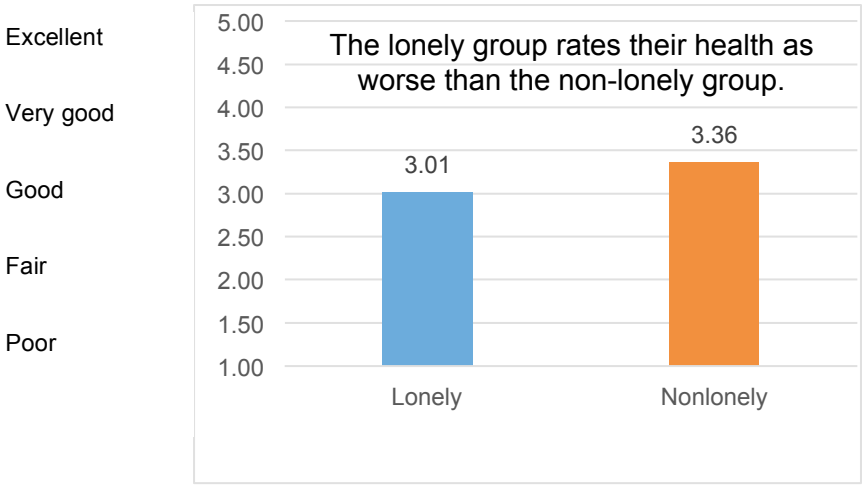
[1] Prior research has shown associations of loneliness with disability and caregiving (Beeson, 2003; Warner & Kelly-Moore, 2012), but in NSHAP the cell sizes are too small and too diverse to reliably estimate the effects of these social circumstances.

This difference is also evident in the fact that the lonely group is more likely to live alone (38% versus 20%). The average household size, however, does not differ significantly between the lonely and non-lonely groups, indicating that having even one other person in the household is sufficient to distinguish the two groups.



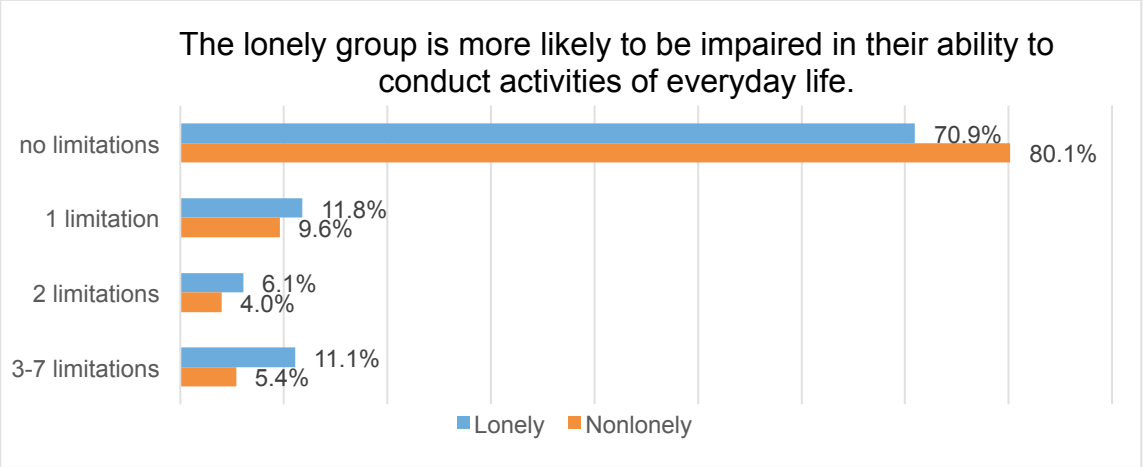
Health Status

The number and severity of chronic health conditions does not differ significantly between the two groups. The small differences that do exist consistently show that the lonely group is more likely to be among those with more chronic health conditions, while the non-lonely group is more likely to be represented among those with no or few health conditions. Subjectively, however, the lonely group rates their health less positively than the non-lonely group.



This section is about your physical health. Would you say your health is excellent, very good, good, fair or poor?

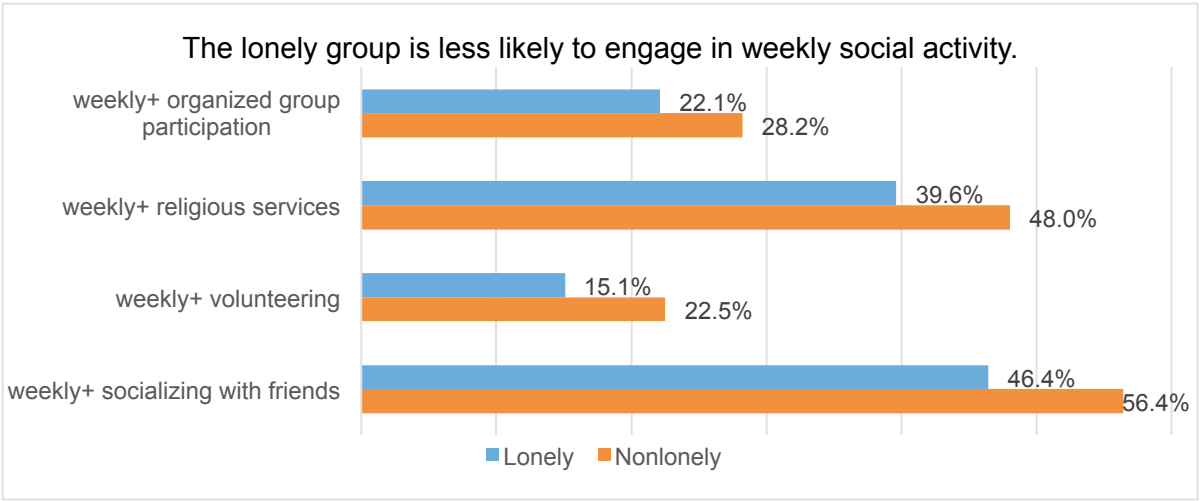
In addition, an objective measure of limitations in the activities of daily living (e.g., dressing, bathing, feeding, and toileting oneself) showed that the lonely group is significantly less likely to be among the unimpaired, and more likely to have more than three such limitations.



- We are interested in what activities are easy or difficult for you. Please tell me how much difficulty you have with each activity (walking a block, walking across a room, dressing, bathing/showering, eating/cutting up food, getting in and out of bed, using a toilet/getting up and down). Exclude any difficulties that you expect to last less than three months.
  - 0="no difficulty," 1="some difficulty," 2="much difficulty," 3="unable to do"
  - Summed responses range from 0-7

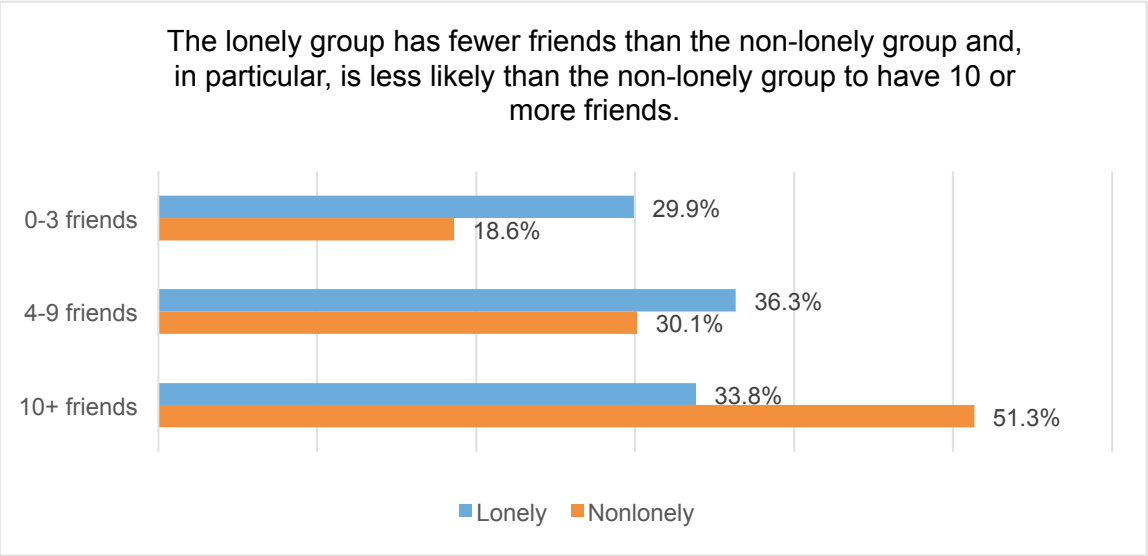
Social Contacts and Engagement

It is reasonable to expect that having more friends and close relatives, and engaging more frequently in a variety of social activities, should be associated with a lower likelihood of loneliness. The data are largely consistent with this assumption. Weekly or more frequent group participation, attendance at religious services, volunteering, and socializing with friends is less typical of the lonely than the non-lonely group.



- In the past 12 months, how often did you attend meetings of any organized group?
- In the past 12 months, about how often have you attended religious services?
- In the past 12 months, how often did you do volunteer work for religious, charitable, political, health-related, or other organizations?
- In the past 12 months, how often did you get together socially with friends or relatives?
  - 7-point response scale, where 0="Never," 1="Less than once a year," 2="About once or twice a year," 3="Several times a year," 4="About once a month," 5="Every week," 6="Several times a week."
  - Recoded to compare weekly and several times a week with all less frequent categories.

In addition, although they have comparable numbers of close relatives, the lonely group reports fewer friends. Moreover, whereas the non-lonely group is increasingly represented in each successively larger friendship category, the lonely group is relatively evenly distributed across friendship groups.



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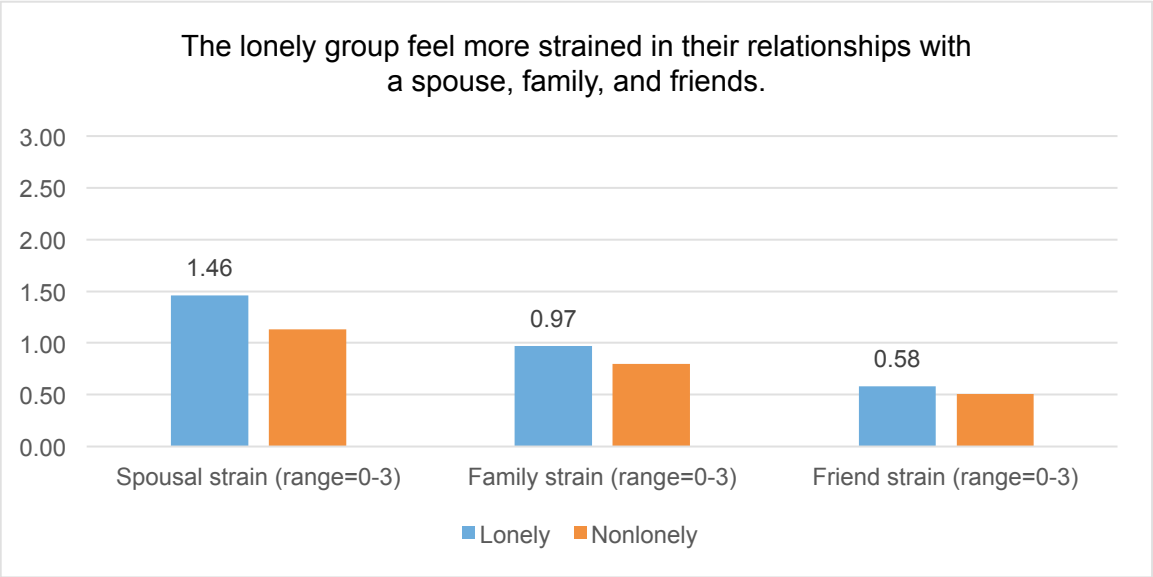
Social Relationship Quality

Relationship quality can be assessed across a variety of relationship types by assessing the support and strain one experiences in each relationship. Relationships provide, among other things, tangible help and emotional care when needed. They can also be a source of stress and strain to the degree that one feels burdened by others' demands and criticism. The lonely group reported consistently lower levels of support and higher levels of strain in their relationships, and this was true of each relationship type evaluated. A spouse (for those who were married), family members, and friends were experienced as less supportive and more difficult in the lonely than the non-lonely group.

A summary measure of marital quality (e.g., "how close do you feel to your spouse?") showed that those in the lonely group felt less close to their spouse/partner than the non-lonely group, but the difference did not achieve statistical significance (p=0.05).

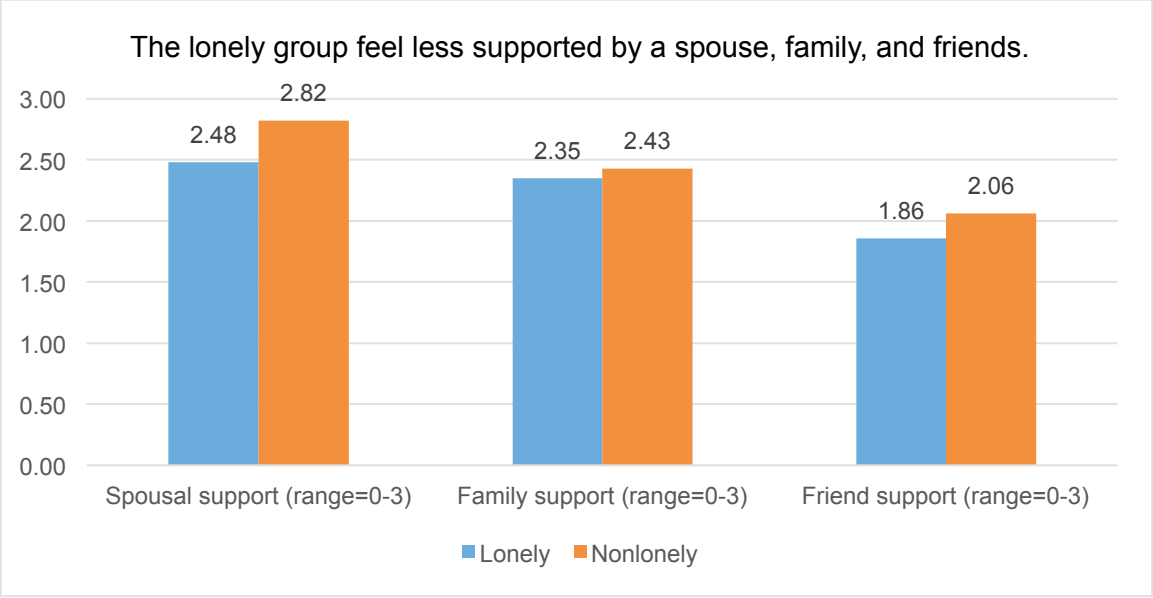
Support refers to how well people feel they can rely on and open up to their friends, family members, and spouse or partner.

Strain refers to how strongly people feel that friends, family, and spouse or partner criticize and make demands on them.



Support

- How often can you open up to [current partner]/members of your family/your friends if you need to talk about your worries?
- How often can you rely on [current partner]/members of your family/your friends for help if you have a problem?
    - 0=never; 1=hardly ever or rarely; 2=some of the time; 3=often
    - Responses are summed for the two support items to produce support scores that range from 0-3.



Strain

- How often does/do [current partner]/members of your family/your friends make too many demands on you?
- How often does/do [current partner]/members of your family/your friends criticize you?
    - 0=never; 1=hardly ever or rarely; 2=some of the time; 3=often
    - Responses are summed for the two strain items to produce strain scores that range from 0-3.

Which segments of the population are at high risk for loneliness?

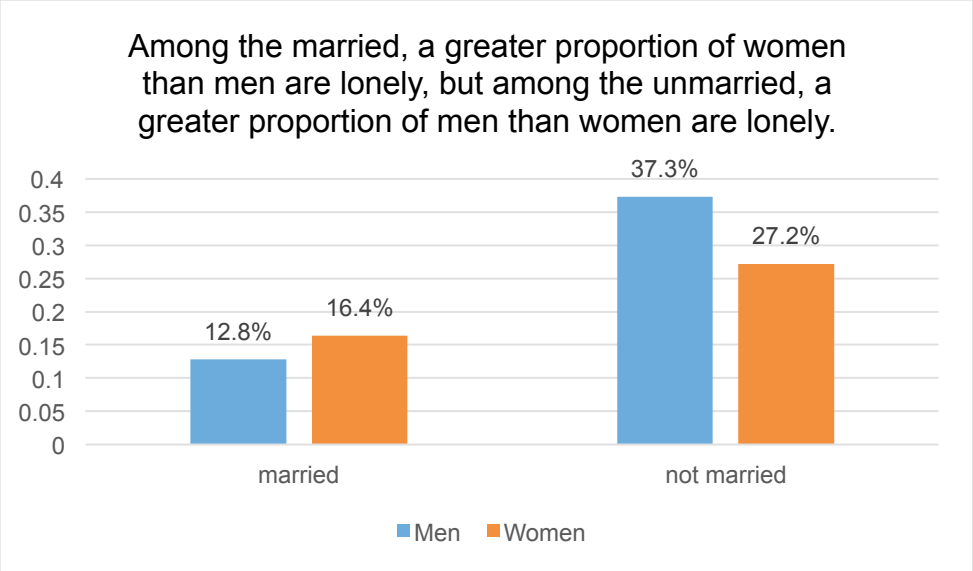
When relationship quality variables (support and strain from family and friends) are considered alongside demographic, socioeconomic, social role and circumstance, health, and social contact variables, the variables that identify membership in the lonely group are marital status, frequency of socializing, number of friends, and strain in family relationships. That is, not being married, having three or fewer friends, socializing less than weekly, and experiencing considerable strain in family relationships are risk factors for loneliness, and the more of these risk factors are present, the greater the odds of being lonely. (See the Appendix, Table 3, Column 1 [“All”] for the odds ratios for each predictor variable.)

Are predictors of loneliness the same in married as in unmarried older adults?

Marriage reduces but does not abolish the likelihood of being lonely. Lonely people are found in both the married and unmarried groups; 14% of the married and 30% of the unmarried group are lonely.

Being married and hence having a larger household implies a larger household income than would be the case for single older adults. This does not mean that income is unimportant in identifying subgroups at high risk of loneliness, however. When married and unmarried older adults are examined separately, a slightly different story emerges for each group. In married older adults, income emerges as a significant predictor of loneliness, and additional unique predictors include gender, attendance at religious services, spousal support, and spousal strain. In unmarried older adults, income is not related to loneliness. Rather, gender, limitations in the activities of daily living, and strain in family relationships predict group membership. (See Appendix, Table 3, Columns 2 and 3—”Married” and “Not Married”—for odds ratios.)

Notably, the gender effect is in opposite directions for married and unmarried older adults. Whereas married women are at greater risk of loneliness than married men, unmarried women have a lower risk of loneliness than unmarried men. In other words, men without a spouse or cohabiting partner are more likely to suffer from loneliness than their unmarried female counterparts. This difference is evident in the proportion of men and women who are lonely in the married and unmarried groups (see figure below).



In summary, the subgroup of married older adults that are at greater risk of loneliness are women, those with a low household income (less than $25,000), less frequent attendance at religious services, and less support from and greater strain in their relationship with their marital partner. In contrast, the subgroup of unmarried older adults that are at greater risk of loneliness are men, those with greater physical health limitations, and those with more strain in their relationships with family members. For each subgroup, any one of the risk factors increases the likelihood of being lonely, and the greater the number of risk factors, the greater the likelihood of being lonely.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Most older adults in the USA are socially connected; they feel little to no loneliness. The prevalence of loneliness, at 19% of adults age 62–91, is lower than was observed in a sample of somewhat younger adults, age 45-70+, polled in 2010 for an earlier report (Wilson & Moulton, 2010). The latter study used a different loneliness measure, however, and the criterion for being classified as lonely or socially connected is not directly comparable with the measure used in the present study. Nevertheless, the prevalence of loneliness decreased with age in the latter study, suggesting that the odds of being lonely should be lower in the older NSHAP sample studied here; this is what was observed.

On the other hand, loneliness prevalence is also expected to decrease with age because of the known association between loneliness and mortality. In fact, the data show that lonely older adults in the NSHAP sample were more likely than socially connected older adults to have died or been institutionalized between 2005 and 2010 (Hawkley & Kocherginsky, under review). The "survivors" in NSHAP who are the subjects of the current report are thus those who feel more socially connected. The question of whether people feel lonelier as they get older requires that the same individuals be tracked over time.

The lonely and socially connected groups differ in many ways, from socioeconomic status to social roles and living arrangements, to social activity and number of friends, and finally to the quality of social relationships. Knowing these differences exist is not the same as knowing how to identify the lonely group in the first place, however. Some segments of the population are at greater risk than others for loneliness; to understand who the at-risk segments are, it pays to know first of all whether an older adult is married or has a co-habiting partner.

Being married has long been established as offering protection against loneliness, but even married adults can feel lonely. To be sure, the prevalence of loneliness is lower in married than unmarried adults, but the fact that loneliness is present at all in this group raises questions about its sources. The quality of the marriage is a good candidate; indeed, married older adults with poorer marital quality are more likely to be lonely. However, marital quality seems to matter more to women; simply being married has a greater protective effect against loneliness in men than in women.

In addition, married older adults who attend religious services infrequently are more likely to be lonely. Such attendance may signify access to a larger network of social resources and support that obviate the need for spouses to be all things for each other. If married older adults either choose or are unable (e.g., due to health concerns) to attend religious services regularly, they may suffer loneliness as a result. An additional finding is that a higher income decreases the odds of loneliness within the married group but not the unmarried group. Additional research is needed to understand what income buys that helps alleviate loneliness in married older adults.

Older adults who are widowed, divorced or separated, or have never been married necessarily structure their social lives differently than their married peers. Unmarried older adults may place greater reliance on family and friends to satisfy their social needs, which suggests that the quality of family relationship and friendships is critically important. Indeed, family relationships that are strained exacerbate risk for loneliness in the unmarried group.

In addition, physical health limitations take a greater toll on loneliness in this group. In the absence of a spouse, older adults who are challenged in carrying out activities of daily life are likely to be acutely sensitive to the lack of a partner who is or could be present to help as needed. Instead, they may find themselves reliant on others and may feel indebted for any help that non-spousal others provide. Interventions that increase perceived control over social aspects of life have been shown to alleviate loneliness (Newall et al., 2009; Schulz, 1976) and suggest that increasing older adults' control over other aspects of life may also have benefits. Additional research is needed to understand whether providing greater autonomy and control over the management of health limitations may alleviate risk for loneliness.

Recommendations

What can older adults do to prevent or alleviate loneliness?

1. Stay or get socially active. Although the exact amount of social activity needed to stave off loneliness is not known, regular participation in organized groups, attendance at religious services, volunteering, and socializing with friends is helpful to maintain social relationships. The less frequently people see each other, the weaker the connections become and the less supportive the relationships are. For most types of social activity, weekly get-togethers are a good goal.

2. Nurture your relationships. Every relationship has its good and bad sides. The goal is to capitalize on the positive side and minimize the negative side. Capitalizing on the positive means telling others about positive events that happen to you, and responding with involvement, excitement, or enthusiasm when someone else shares a positive event with you (Gable & Reis, 2010). Reciprocal interest in each other's positive experiences strengthens the bond between people. Minimizing the negative side of relationships can include reducing the frequency of interactions with difficult people in your network, and seeking professional counsel when needed to resolve long-standing conflicts. Finding ways to reduce strain in family relationships is particularly important because these relationships are often the ones we turn to in times of need. Capitalizing on the positive aspects of family relationships may make it easier to deal or live with the negative aspects.

3. Find and take advantage of local resources. Find out what your community or state offers in the way of transportation options (subsidized transit services may be available to get you to your book club or bingo game), caregiver respite (a day or even a half-day per week away from primary caregiver responsibilities and socializing with supportive others can make a big difference in the quality of both your life and your relationship with the care recipient), or in-home assistance with housecleaning (friends are more likely to want to visit you in a clean home than one that looks disorganized and smells bad).

What vulnerable populations should intervention providers target?

1. Married older adults with a low household income are at greater risk for loneliness than their higher-income peers. However, those with a low household income warrant targeting regardless of marital status given that the mechanisms linking income and loneliness are not well understood at this point. Those with a lower income may suffer from a limited range of social activity options, possibly because activities cannot be afforded, or transit cannot be afforded, or mobility limitations are inadequately addressed.

2. Older adults with poor health, particularly those who have mobility limitations that hamper their ability to get outside the house, are at risk for loneliness and may benefit from assistance (e.g., transport, assistive devices) that allows them a greater range of social activity options to suit their individual needs.

3. Unmarried older men appear more vulnerable to loneliness than unmarried women. This may be due to men relying on a spouse to organize their social activities, or to men's lack of confidants outside of a spouse.

What additional questions can research address?

1. What do greater income and wealth "buy" that improves social connectedness and reduces the odds of loneliness? Longitudinal data are needed to test whether income affords people with, for example, more social opportunities, better health, or reduced relational strain, and whether these outcomes explain why low-income older adults are at greater risk of loneliness.

2. Do people get lonelier with age? Extant research is limited, and additional work is needed to better understand whether and when in later life loneliness frequency increases in individuals, and prevalence increases in society at large. In addition, longitudinal data are needed to estimate the prevalence of changes in loneliness (both increases and decreases), and to identify whether changes in the prevalence or intensity of risk factors over time explain subsequent changes in loneliness.

3. What other factors may increase risk for loneliness? Poor sensory functioning, particularly poor hearing, has been associated with greater loneliness, as has even mild cognitive impairment. To better understand whether sensory and cognitive abilities "cause" loneliness, longitudinal data are needed to determine whether changes in sensory and cognitive functioning precede changes in loneliness.

4. To what extent is loneliness a consequence versus a cause of deteriorating physical and mental health? Loneliness is known to be reciprocally related to physical mobility limitations, depressive symptoms, and other health outcomes. Longitudinal data are needed to determine the magnitude of and temporal lags that characterize the reciprocal associations between loneliness and various health outcomes.

DETAILED METHODOLOGY AND FINDINGS

Data and Sample

Data from Wave 2 (W2) of the National Social Life Health and Aging Project (NSHAP) were used to describe the social connectedness of older adults. NSHAP is a nationally representative study of health and social relationships among older Americans. NSHAP collaborated with the Health and Retirement Study (HRS) to obtain a sampling frame of U.S. households containing age-eligible individuals, and then used a multiple-stage probability sampling method to randomly select individuals for participation in the study. The complex sample design balanced age and gender subgroups, but oversampled Blacks and Hispanics.

The 2005-06 Wave 1 (W1) study sample included 3,005 adults age 57–85 (O'Muircheartaigh, Eckman, & Smith, 2009; Waite et al., 2014a). Five years later in 2010-11 NSHAP re-interviewed 2,261 surviving W1 respondents, and added 161 W1 non-respondents and 955 spouses and cohabiting romantic partners in W2 (O'Muircheartaigh, English, Pedlow, & Kwok 2014; Waite et al., 2014b). The study sample in W2 includes 3,377 adults age 36–99. Data for both waves are collected by an interviewer-administered in-home in-person questionnaire (IPQ), an in-home biomeasure collection procedure, and a self-administered post-interview questionnaire (leave-behind questionnaire or LBQ).

The sample for this report includes 3,240 age-eligible (62–91) respondents from W2. The average age of the sample was 72 years; 53% of the sample was female and 81% of the sample was White.

Measures

Loneliness. The key indicator of social connectedness is a measure of loneliness. NSHAP asks three loneliness questions in the LBQ:

1. How often do you feel that you lack companionship?
2. How often do you feel left out?
3. How often do you feel isolated from others?

The response categories are "Never," "Hardly ever," "Some of the time," and "Often." Loneliness variables are coded "Never"/"Hardly Ever"=0; "Some of the time"=1 and "Often"=2. The three items are then summed, resulting in a loneliness scale that ranges from 0 to 6. The reliability coefficient for this scale is α=0.81. Higher scores on the scale indicate higher frequency of loneliness symptoms. The loneliness scale was additionally collapsed into a dichotomous measure that contrasted non-lonely individuals (scores of 0-2) with lonely individuals (scores of 3-6). Scores of 3 and greater were considered of sufficient frequency to identify an individual as lonely because these values imply that a person feels isolated and left out and like they lack companionship at least some of the time.

Potential correlates of loneliness included a range of variables that can be categorized into measures of *demographic characteristics, socioeconomic status, social roles and circumstances*, *health, social contacts and engagement, marital quality, social support, and social strain.*

Demographic characteristics. Information about *age* (date of birth), *gender*, and *race-ethnicity* were obtained by self-report.

Socioeconomic status. Education contrasted all levels of attainment with *less than high school*. Open-ended questions asked about *assets* and *household income*. Respondents who did not report exact amounts were asked a series of "unfolding bracket" questions and actual values were placed in the corresponding categories.

Social roles and circumstances. Marital status is captured with the IPQ question "Are you currently married, living with a partner, separated, divorced, widowed, or have you never been married?" For *employment status,* responses were collapsed into four categories: working; retired and working; retired; and all other categories (unemployed, disabled, homemaker). *Primary caregivers* were so defined if they responded affirmatively to a questions about their being the primary caregiver AND reported providing more than 20 hours a week of care to the recipient. A social network interview conducted during the IPQ obtained information on all members of the household. *Living arrangements* contrasted those who live alone, live with a spouse or partner (with or without others), and live with non-spousal others. *Household size* was a sum of the number of household members.

Health. Self-rated health was obtained during the IPQ by asking respondents whether they felt their health was excellent, very good, good, fair or poor. A *comorbidity index* was derived from responses to questions about 15 possible health conditions (e.g., hypertension, diabetes, cancer, heart failure). Conditions were weighted for severity as has been documented previously (Vasilopoulos et al., 2014) to create a summary scale that ranged from 0 to 13. *Functional limitations* were summed across seven activities of daily living (walking a block, walking across a room, dressing, bathing/showering, eating/cutting up food, getting in and out of bed, using a toilet/getting up and down), where activities for which respondents reported at least some difficulty were coded as limited activity domains.

Social contacts and engagement. Frequencies of *group meeting attendance* (e.g., choir, committee or board, support group, sports or exercise group, hobby group or professional society), *church service attendance, volunteering* (for religious, charitable, political, health-related or other organizations), and *socializing* with close friends and relatives ranged from 0 (never) to 6 (several times a week), with intervening categories of less than once a year, about once or twice a year, several times a year, about once a month, and every week. Small cells were collapsed and frequencies weekly and greater were compared with less regular frequencies. Respondents' numbers of *close relatives* and *friends* were obtained from the main interview*;* categorical responses included 0, 1, 2-3, 4-9, 10-20 and more than 20. To ensure adequate cell sizes, responses were collapsed to compare 0-3 with 4-9 and 10 or more.

Marital Quality. Marital quality is captured with a single CAPI question that asks "Taking all things together, how would you describe your (marriage/relationship) with [CURRENT PARTNER] on a scale from 1 to 7 with 1 being very unhappy and 7 being very happy?"

Social Support. Scales were created for spousal support, family support, and friend support. These scales average the respondents' scores on two measures of support for each group of significant others. In the IPQ, respondents are asked "How often can you open up to [current partner/family members/friends] if you need to talk about your worries?" and "How often can you rely on [current partner/family members/friends] for help if you have a problem? The answer categories include "Never"=0, "Hardly Ever or Rarely"=1, "Some of the Time"=2, and "Often"=3. Those who report not having family members or friends receive a score of 0 for that support measure. Those without spouses are excluded from the spousal support scale. These scales range from 0-3, with higher scores indicating higher levels of social support. Cronbach's alpha

for the spousal support scale is α=0.59; α=0.62 for the family support scale; and α=0.74 for the friend support scale.

Social Strain. Strain scales for spouses, family, and friends were created by averaging the scores from two questions about each group. The IPQ questions assessing strain are "How often [does current partner/do family members/do friends] make too many demands on you?" and "How often [does current partner/do family members/do friends] criticize you?" The answer categories are analogous to that of the support variables. These scales range from 0 to 3, with higher scores indicating more strain in each type of relationship. The reliability coefficient for the spousal strain scale is α=0.63; α=0.53 for the family strain scale; and α=0.59 for the friends strain scale.

Data Analysis

Univariate descriptive statistics (Appendix, Table 1) are used to provide proportions (with 95% confidence intervals, or CIs) of the older adult sample within each variable category, and means (with standard deviations) for variables with continuous values.

To test whether categorical variables differ in prevalence between the lonely and non-lonely groups, multinomial logistic regression models are followed by adjusted Wald tests. Post hoc contrasts (adjusted Wald tests) are conducted for only those variables that exhibit a significant effect in the multinomial model, and are used to identify categories that contribute to the significant main effect for any given variable. Results of adjusted Wald tests are also used to compare mean levels of continuous variables between the lonely and non-lonely groups. Table 2 (see Appendix) provides proportions/means (95% CIs and SDs, respectively), *F*-values, *p*-levels, and sample sizes for each variable and variable category as a function of group (lonely versus non-lonely).

To identify risk factors for loneliness, a logit regression model is used to regress being lonely (vs. non-lonely) on the complete set of variables under consideration. Odds ratios (95% CIs) and indicators of statistical significance are provided in the Appendix, Table 3, column "All." Follow-up logit regression models stratify the sample by marital status (married or cohabiting with a partner; all non-married statuses). Results are provided in the Appendix, Table 3, columns "Married" and "Not Married." In each model, only those categorical variables that have a significant overall effect are subjected to category-level comparisons.

All analyses use weights for age-eligibility and are survey-weighted to account for differential probabilities of selection and differential nonresponse to ensure that results apply to the larger older adult population. Statistical significance is set at $p<.05$.

Tables

Figures and results reported in this document are based on analyses reported below and summarized in Tables provided in the Appendix.

Table 1. Descriptive Characteristics of the NSHAP Sample Age 62–91 Years in 2010
Table 2. Characteristics That Differentiate Lonely and Non-lonely Older Adults Age 62–91 Years
Table 3. Odds Ratios (95% C.I.) in Logit Regressions of Loneliness on Predictor Variables.

REFERENCES

Beeson, R. A. (2003). Loneliness and depression in spousal caregivers of those with Alzheimer's Disease versus non-caregiving spouses. *Archives of Psychiatric Nursing, 17*,135-43.

Cacioppo, J. T., & Cacioppo, S. (2014). Social relationships and health: The toxic effects of perceived social isolation. *Social and Personality Compass, 8*, 58-72.

Cornwell, B., Laumann, E. O., & Schumm, L. P. (2008). The social connectedness of older adults: A national profile. *American Sociological Review, 73*, 185-203.

Gable, S. L., & Reis, H. T. (2010). Good news! Capitalizing on positive events in an interpersonal context. *Advances in Experimental Social Psychology, 42*, 195-257.

Hawkley, L. C., & Cacioppo, J. T. (2010). Loneliness matters: A theoretical and empirical review of consequences and mechanisms. *Annals of Behavioral Medicine, 40*, 218–227.

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Med. 7(7)*, e1000316.

Holt-Lunstad, J., Smith, T. B., Baker, M., Harris, T., & Stephenson, D. (2015). Loneliness and social isolation as risk factors for mortality: A meta-analytic review. *Perspectives on Psychological Science, 10*, 227-237.

Newall, N. E., Chipperfield, J. G., Clifton, R. A., Perry, R. P., Swift, A. U. & Ruthig, J. C. (2009). Causal beliefs, social participation, and loneliness among older adults: A longitudinal study. *Journal of Social and Personal Relationships, 26*, 273-290.

O'Muircheartaigh, C., Eckman, S., & Smith, S. (2009). Statistical design and estimation for the National Social Life, Health, and Aging Project. *Journals of Gerontology: Social Sciences, 64B*, i12-i19. doi:10.1093/geronb/gbp045.

O'Muircheartaigh, C., English, N., Pedlow, S., & Kwok, P. K. (2014). Sample design, sample augmentation, and estimation for Wave II of the National Social Life, Health and Aging Project (NSHAP). *Journals of Gerontology: Social Sciences, 69*, S15-S26.

Schulz, R. (1976). Effects of control and predictability on the physical and psychological well-being of the institutionalized aged. *Journal of Personality and Social Psychology, 33*, 563-573.

Vasilopoulos, T., Kotwal, A., Huisingh-Scheetz, M. J., Waite, L. J., McClintock, M. K., & Dale, W. (2014). Comorbidity and chronic conditions in the National Social Life, Health and Aging Project (NSHAP), Wave 2. *Journals of Gerontology: Social Sciences, 69*, S154-S165.

Waite, L. J., Cagney, K., Dale, W., Huang, E., Laumann, E. O., McClintock, M.,…& Cornwell, B. National Social Life, Health, and Aging Project (NSHAP): Wave 2 and Partner Data Collection. ICPSR34921-v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2014-04-29. doi:10.3886/ICPSR34921.v1.

Waite, L. J., Laumann, E. O., Levinson, W., Lindau, S. T., & O'Muircheartaigh, C. A. National Social Life, Health, and Aging Project (NSHAP): Wave 1. ICPSR20541-v6. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2014-04-30. doi:10.3886/ICPSR20541.v6.

Warner, D. F., & Kelley-Moore, J. (2012). The social context of disablement among older adults: Does marital quality matter for loneliness? *Journal of Health and Social Behavior, 53*, 50-66.

Wilson, C. & Moulton, B. (2010). Loneliness among older adults: A national survey of adults 45+. Prepared by Knowledge Networks and Insight Policy Research. Washington, DC: AARP.

APPENDIX: TABLES

Table 1. Descriptive Characteristics of the NSHAP Sample Age 62–91 in 2010.[a]

	Mean (SD)/percent (95% Confidence Interval)
Demographics	
Age, years (mean)	72.2 (7.5)
Female (%)	52.6 (50.1, 54.5)
Race-ethnicity	
White (%)	81.4 (77.7, 84.6)
Black (%)	9.2 (7.2, 11.7)
Hispanic, non-Black (%)	6.8 (4.3, 10.6)
other (%)	2.6 (1.8, 3.8)
Socioeconomic Status	
Education	
less than high school (%)	16.4 (13.5, 19.8)
high school/GRE equivalent (%)	25.2 (22.8, 27.8)
vocational certificate/some college/associate degree (%)	31.8 (29.1, 34.5)
bachelor's degree or more (%)	26.6 (23.1, 30.5)
Household income	
less than $25K (%)	29.1 (25.7, 32.8)
$25K - $49.99K (%)	34.0 (30.6, 37.1)
$50K - $99.99K (%)	33.8 (30.6, 37.1)
$100K or more (%)	3.1 (2.2, 4.4)
Household assets	
less than $10K (%)	8.8 (7.4, 10.6)
$10K - $49.99K (%)	11.4 (9.3, 14.0)
$50K - $99.99K (%)	10.0 (8.3, 11.9)
$100K - $499.99K (%)	41.1 (37.8, 44.3)
$500K or more (%)	28.8 (25.0, 32.9)
Social roles & circumstances	
Marital status	
married	63.5 (61.1, 65.8)
partnered, cohabiting (%)	2.5 (1.8, 3.4)
divorced (%)	9.0 (7.9, 10.3)
separated (%)	1.1 (0.7, 1.7)
widowed (%)	21.4 (19.2, 23.7)
never married (%)	2.5 (1.9, 3.4)

[a] All estimates are weighted to account for differential probabilities of selection and differential nonresponse.

Table 1, cont'd.

	Mean (SD)/percent (95% Confidence Interval)
Employment status	
working (%)	16.8 (14.8, 19.0)
working & retired (%)	6.9 (5.5, 8.7)
retired (%)	65.7 (63.4, 68.0)
disabled/unemployed/other (%)	10.6 (8.8, 12.6)
Primary caregiver (%)	4.8 (3.9, 6.0)
Living arrangements	
living alone	24.8 (23.1, 26.6)
living with spouse/partner +/- others	65.4 (63.1, 67.4)
living with others, not spouse/partner	9.8 (8.6, 11.2)
Household size (average # of people living in household)	1.0 (1.0)
Health	
self-rated health	3.2 (1.1)
comorbidity index	
0 (%)	9.6 (8.2, 11.3)
1 (%)	20.7 (18.8, 22.7)
2 (%)	23.1 (21.4, 24.9)
3 (%)	18.1 (16.8, 19.6)
4-13 (%)	28.4 (26.3, 30.6)
limitations in the activities of daily living	
0 (%)	67.2 (65.1, 69.2)
1 (%)	13.3 (12.0, 14.8)
2 (%)	6.8 (5.8, 7.9)
3-7 (%)	12.8 (11.0, 14.7)

Table 1, cont'd.

	Mean (SD)/percent (95% Confidence Interval)
Social contacts and engagement	
Frequency of organized group participation (% weekly or more)	27.0 (25.2, 28.8)
Frequency of religious service attendance (% weekly or more)	45.6 (42.7, 48.5)
Frequency of volunteering (% weekly or more)	21.5 (19.6, 23.5)
Frequency of socializing with friends (% weekly or more)	54.0 (51.7, 56.4)
# close relatives	
% 0-3	32.1 (30.0, 34.4)
% 4-9	43.7 (41.8, 45.6)
% 10 or more	24.1 (22.1, 26.3)
# friends	
% 0-3	22.8 (20.6, 25.2)
% 4-9	30.8 (29.0, 32.6)
% 10 or more	46.4 (43.6, 49.1)
Satisfaction with marital relationship (range=1-7)	6.3 (1.3)
Social support (can open up to and rely on others)	
Spousal support (range=0-3)	2.8 (0.5)
Family support (range=0-3)	2.4 (0.7)
Friend support (range=0-3)	2.0 (0.9)
Social strain (others are demanding and critical)	
Spousal strain (range=0-3)	1.2 (0.8)
Family strain (range=0-3)	0.8 (0.7)
Friend strain (range=0-3)	0.5 (0.6)

Table 2. Characteristics That Differentiate Lonely and Non-Lonely Older Adults Age 62–91.[a]

	Mean (SD)/Percent (95% confidence Interval)				
	Lonely	Non-Lonely	Statistic (F)	p-value	N
Demographics					
Age, years (mean)	72.4 (0.4)	71.9 (0.2)	2.78	0.1015	2,594
Female (%)	57.8 (52.9, 62.6)	51.9 (49.3, 54.5)	3.96	0.0521	2,594
Race-ethnicity			1.75	0.1841	2,586
White (%)	83.9 (79.0, 87.8)	84.7 (81.5, 87.4)			
Black (%)	8.6 (5.9, 12.4)	6.4 (4.9, 8.3)			
Hispanic, non-Black (%)	5.1 (3.2, 7.9)	6.3 (4.0, 9.6)			
other (%)	2.4 (1.1, 5.4)	2.6 (1.8, 3.8)			
Socioeconomic status					
Education			2.17	0.1040	2,594
less than high school (%)	14.9 (11.6, 18.9)	13.7 (11.3, 16.7)			
high school/GRE equivalent (%)	27.5 (23.4, 32.0)	24.6 (22.0, 27.4)			
vocational certificate/some college/associate degree (%)	33.5 (28.4, 39.0)	32.7 (29.6, 36.0)			
bachelor's degree or more (%)	24.1 (20.0, 28.7)	28.9 (25.0, 33.1)			
*Household income			7.54	0.0003	2,095
less than $25K (%)	37.4 (30.8, 44.4)	23.8 (20.6, 27.3)	16.60	0.0002	
$25K - $49.99K (%)	32.9 (27.8, 38.5)	35.1 (32.6, 37.6)	0.59	0.4470	
$50K - $99.99K (%)	26.8 (22.0, 32.3)	37.7 (34.0, 41.5)	15.35	0.0003	
$100K or more (%)	2.9 (1.4, 6.0)	3.5 (2.2, 5.3)	0.20	0.6592	
*Household assets			2.89	0.0322	2,231
less than $10K (%)	12.1 (8.9, 16.4)	6.7 (5.1, 8.7)	7.11	0.0103	
$10K - $49.99K (%)	12.2 (8.6, 16.9)	10.5 (8.3, 13.1)	0.70	0.4083	
$50K - $99.99K (%)	9.9 (7.1, 13.7)	9.1 (7.3, 11.2)	0.28	0.6020	
$100K - $499.99K (%)	41.0 (35.6, 46.6)	42.7 (39.4, 46.0)	0.44	0.5113	
$500K or more (%)	24.7 (19.8, 30.4)	31.0 (26.8, 35.6)	7.32	0.0093	
Social roles & circumstances					
*Marital status			18.67	0.0000	2,594
married or partnered and cohabiting (%)	51.3 (46.3, 56.1)	72.9 (69.8, 75.7)	50.04	0.0000	
divorced/separated (%)	13.6 (10.5, 17.5)	8.3 (7.1, 9.8)	8.79	0.0046	
widowed (%)	31.4 (27.1, 36.0)	17.0 (14.7, 19.5)	28.05	0.0000	
never married (%)	3.8 (2.3, 6.2)	1.8 (1.2, 2.7)	3.81	0.0564	

[a] All estimates are weighted to account for differential probabilities of selection and differential nonresponse.

Table 2, cont'd.					
Employment status			1.79	0.1608	2,590
working (%)	13.7 (9.9, 18.8)	18.4 (15.8,21.2)			
working & retired (%)	6.3 (4.2, 9.4)	7.3 (5.7, 9.2)			
retired (%)	66.9 (62.0, 71.4)	64.5 (61.7, 67.2)			
disabled/unemployed/other (%)	13.0 (9.5,17.5)	9.9 (7.9, 12.3)			
Primary caregiver (%)	5.9 (3.8, 9.0)	5.3 (4.3, 6.6)	0.22	0.6387	2,594
*Living arrangements			23.93	0.0000	2,591
living alone	37.7 (32.4, 43.4)	20.2 (17.7, 22.8)	30.10	0.0000	
living with spouse/partner +/- others	51.3 (46.5, 56.1)	71.9 (68.9, 74.7)	47.49	0.0000	
living with others, not spouse/partner	11.0 (8.3, 14.3)	7.9 (6.4, 9.8)	2.53	0.1184	
Household size (average # of people living in household)	0.91 (0.80, 1.02)	1.04 (0.98, 1.10)	3.75	0.0586	2,591
Health					
*self-rated health	3.01 (2.87, 3.14)	3.36 (3.28, 3.44)	23.74	0.0000	2,591
comorbidity index			2.22	0.0809	2,594
0 (%)	8.7 (6.2, 12.1)	9.7 (7.7, 12.1)			
1 (%)	17.8 (14.8, 21.4)	21.6 (19.4, 24.0)			
2 (%)	23.2 (19.5, 27.3)	24.1 (22.0, 26.3)			
3 (%)	18.3 (15.0, 22.1)	17.9 (16.1, 19.9)			
4-13 (%)	32.0 (27.4, 36.9)	26.7 (24.2, 29.4)			
*# of limitations in the activities of daily living			9.02	0.0001	2,588
0 (%)	58.0 (53.5, 62.5)	70.2 (67.4, 72.8)	22.56	0.0000	
1 (%)	14.7 (11.0, 19.3)	13.1 (11.2, 15.2)	0.51	0.4772	
2 (%)	8.7 (6.7, 11.1)	6.3 (5.1, 7.8)	3.45	0.0691	
3-7 (%)	18.6 (15.1, 22.7)	10.4 (8.5, 12.7)	12.93	0.0007	

Table 2, cont'd.					
Social contacts and engagement					
*Frequency of organized group participation (% weekly or more)	22.1 (18.7, 25.9)	28.2 (26.1, 30.4)	7.46	0.0087	2,559
*Frequency of religious service attendance (% weekly or more)	39.6 (34.4, 45.1)	48.0 (44.1, 52.0)	7.26	0.0096	2,587
*Frequency of volunteering (% weekly or more)	15.1 (11.8, 19.2)	22.5 (20.2, 25.0)	12.47	0.0009	2,563
*Frequency of socializing with friends (% weekly or more)	46.4 (41.0, 51.9)	56.4 (53.5, 59.3)	8.95	0.0043	2,565
# close relatives			2.18	0.1235	2,593
0-3	36.1 (31.6, 40.8)	30.3 (27.4, 33.3)			
4-9	42.6 (38.0, 27.4)	44.9 (42.8, 46.9)			
10+	21.3 (17.4, 25.8)	24.9 (22.5, 27.4)			
*# friends			17.82	0.0000	2,589
0-3	29.9 (25.5, 34.7)	18.6 (16.5, 21.0)	21.72	0.0000	
4-9	36.3 (32.1, 40.7)	30.1 (27.4, 32.9)	5.62	0.0216	
10+	33.8 (29.3, 38.6)	51.3 (47.7, 54.8)	34.25	0.0000	
***Satisfaction with marital relationship** (range=1-7)	5.8 (5.6, 6.0)	6.5 (6.4, 6.5)	40.60	0.0000	1,931
Social support (can open up to and rely on others)					
*Spousal support (range=0-3)	2.48 (2.40, 2.57)	2.82 (2.80, 2.84)	57.16	0.0000	1,934
*Family support (range=0-3)	2.35 (2.28, 2.42)	2.43 (2.40, 2.47)	4.43	0.0403	2,593
*Friend support (range=0-3)	1.86 (1.77, 1.95)	2.06 (2.01, 2.11)	14.73	0.0004	2,594
Social strain (others are demanding and critical)					
*Spousal strain (range=0-3)	1.46 (1.38, 1.55)	1.13 (1.08, 1.18)	47.70	0.0000	1,935
*Family strain (range=0-3)	0.97 (0.90, 1.04)	0.80 (0.76, 0.83)	19.39	0.0001	2,568
*Friend strain (range=0-3)	0.58 (0.53, 0.64)	0.51 (0.48, 0.53)	6.00	0.0179	2,561

* Indicates variables that differ significantly between the lonely and non-lonely group, p<.05

Table 3. Odds Ratios (95% C.I.) in Logit Regressions of Loneliness on Predictor Variables.[a]

	All	Married	Not Married
Demographics			
Age, years	0.99 (0.97, 1.01)	0.99 (0.96, 1.03)	0.98 (0.94, 1.02)
Female	1.03 (0.71, 1.49)	1.62 (1.04, 2.53)*	0.48 (0.29, 0.79)*
Race-ethnicity (ref=White)			
Black	0.78 (0.42, 1.44)	1.65 (0.78, 3.48)	0.55 (0.25, 1.22)
Hispanic, non-Black	0.61 (0.37, 1.02)	0.38 (0.18, 0.81)	0.98 (0.45, 2.13)
other	0.46 (0.16, 1.36)	0.67 (0.12, 3.72)	0.43 (0.09, 2.08)
Socioeconomic status			
Education (ref=less than high school)			
high school/GRE equivalent	1.18 (0.74, 1.90)	1.04 (0.50, 2.16)	1.46 (0.79, 2.71)
vocational certificate/some college/associate degree	1.36 (0.88, 2.09)	1.07 (0.61, 1.88)	1.89 (0.94, 3.80)
bachelor's degree or more	1.05 (0.63, 1.74)	0.85 (0.44, 1.64)	1.28 (0.53, 3.11)
Household income (ref=less than $25K)	*F=0.87, p=0.461*	*F=3.70, p=0.018*	*F=0.01, p=0.986*
$25K - $49.99K	0.79 (0.54, 1.16)	0.55 (0.31, 0.96)*	0.97 (0.60, 1.58)
$50K - $99.99K	0.70 (0.40, 1.24)	0.46 (0.27, 0.78)*	1.02 (0.41, 2.51)
$100K or more	1.08 (0.38, 3.07)	1.21 (0.45, 3.24)	N:A
Household assets (ref=less than $10K)	*F=0.50, p=0.737*	*F=1.22, p=0.317*	*F=0.35, p=0.844*
$10K - $49.99K	0.83 (0.44, 1.57)	0.43 (0.16, 1.17)	1.06 (0.49, 2.31)
$50K - $99.99K	0.98 (0.54, 1.77)	0.91 (0.32, 2.55)	0.82 (0.36, 1.85)
$100-499.99K	1.00 (0.55, 1.79)	0.85 (0.36, 2.02)	1.04 (0.50, 2.15)
$500K or more	1.24 (0.66, 2.32)	0.93 (0.41, 2.13)	1.47 (0.52, 4.19)
Social roles & circumstances			
Marital status (ref=married or partnered/cohabiting)	*F=10.04, p=0.000*	*N:A*	*F=0.71, p=0.499*
divorced/separated	2.56 (1.68, 3.89)*	N:A	ref
widowed	2.95 (1.81, 4.83)*	N:A	1.28 (0.80, 2.04)
never married	2.92 (1.40, 6.10)*	N:A	0.89 (0.35, 2.24)
Employment status (ref=working)	*F=0.42, p=0.738*	*F=1.19, p=0.325*	*F=2.06, p=0.119*
working & retired	1.35 (0.66, 2.76)	0.43 (0.16, 1.10)	5.28 (1.41, 19.8)
retired	1.28 (0.80, 2.05)	0.90 (0.57, 1.43)	3.08 (1.01, 9.39)
disabled/unemployed/other	1.48 (0.68, 3.26)	1.09 (0.51, 2.32)	3.18 (0.76, 13.38)
Primary caregiver	1.17 (0.64, 2.16)	1.01 (0.45, 2.26)	0.77 (0.13, 4.37)
Household size (average # of people living in household)	1.07 (0.91, 1.25)	1.07 (0.86, 1.33)	1.10 (0.87, 1.39)

[a] All estimates are weighted to account for differential probabilities of selection and differential nonresponse.

Table 3, cont'd.

Health			
self-rated health	0.87 (0.70, 1.09)	0.97 (0.76, 1.23)	0.89 (0.64, 1.22)
comorbidity index (ref=0)	*F=0.05, p=0.995*	*F=0.66, p=0.625*	*F=0.41, p=0.802*
1	0.99 (0.53, 1.84)	1.03 (0.50, 2.14)	0.87 (0.24, 3.16)
2	0.97 (0.58, 1.62)	1.07 (0.50, 2.32)	0.71 (0.23, 2.19)
3	1.07 (0.57, 2.01)	1.07 (0.43, 2.63)	0.84 (0.29, 2.42)
4-13	1.00 (0.56, 1.77)	0.70 (0.32, 1.53)	1.19 (0.40, 3.58)
# of limitations in the activities of daily living (ref=0)	*F=1.12, p=0.350*	*F=0.72, p=0.544*	*F=2.82, p=0.049*
1	1.24 (0.75, 2.03)	1.32 (0.68, 2.55)	1.39 (0.67, 2.86)
2	1.15 (0.68, 1.95)	1.37 (0.61, 3.07)	0.87 (0.28, 2.65)
3-7	1.51 (0.96, 2.37)	1.61 (0.80, 3.23)	2.29 (1.17, 4.47)
Social contacts and engagement			
Weekly+ participation in organized groups	1.04 (0.72, 1.50)	0.97 (0.64, 1.45)	1.10 (0.64, 1.88)
Weekly+ religious service attendance	0.78 (0.55, 1.11)	0.62 (0.40, 0.95)*	1.08 (0.62, 1.89)
Weekly+ volunteering	0.72 (0.46, 1.12)	1.01 (0.51, 2.02)	0.46 (0.21, 1.01)
Weekly+ socializing with friends	0.64 (0.45, 0.90)*	0.64 (0.40, 1.02)	0.66 (0.39, 1.12)
# close relatives (ref=0-3)	*F=0.06, p=0.945*	*F=0.02, p=0.977*	*F=0.44, p=0.645*
4-9	0.95 (0.68, 1.31)	1.00 (0.60, 1.68)	1.02 (0.54, 1.91)
10+	0.95 (0.62, 1.45)	0.95 (0.52, 1.72)	0.77 (0.36, 1.67)
# friends (ref=0-3)	*F=4.37, p=0.018*	*F=3.91, p=0.027*	*F=2.19, p=0.123*
4-9	1.08 (0.80, 1.46)	1.52 (0.99, 2.34)	0.87 (0.47, 1.61)
10+	0.62 (0.44, 0.90)*	0.89 (0.57, 1.37)	0.50 (0.24, 1.05)
Satisfaction with marital relationship	N:A	0.85 (0.72, 1.00)	N:A
Social support (can open up to and rely on others)			
Spousal support	N:A	0.37 (0.23, 0.58)*	N:A
Family support	0.95 (0.78, 1.16)	0.95 (0.69, 1.30)	1.06 (0.74, 1.52)
Friend support	0.88 (0.72, 1.09)	0.81 (0.59, 1.11)	1.01 (0.73, 1.39)
Social strain (others are demanding and critical)			
Spousal strain	N:A	1.46 (1.13, 1.87)*	N:A
Family strain	1.57 (1.28, 1.93)*	1.30 (1.00, 1.69)	1.70 (1.27, 2.27)**
Friend strain	1.16 (0.93, 1.45)	1.04 (0.75, 1.43)	1.20 (0.89, 1.61)

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

ABOUT AARP FOUNDATION

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