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Functional Status and Social Contact among Older Adults

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Abstract

This paper tests whether functional status is associated with likelihood of social contact among older adults. Data come from the LSOA II, a longitudinal nationally representative sample of 9,447 non-institutionalized individuals aged 70 and over at baseline in 1995. Functional status is measured using an index of activities of daily living (ADL) and instrumental activities of daily living (IADL). Social contact is measured by asking respondents whether they had gotten together socially or talked on the phone with friends/neighbors or family in the past two weeks. Greater number of functional limitations is associated with a decreased likelihood of social contact at follow-up via the phone with friends (OR=0.94, $p<.01$) and family (OR=0.96, $p<.01$), as well as a decreased likelihood of getting together with friends (OR=0.93, $p<.01$) and family (OR=0.97, $p<.01$). Results indicate that functional limitations have a broad impact on self-reported social contact among older adults.

Keywords

Social contact; social relationships; social embeddedness; functional limitations; longitudinal analysis

Introduction

There is strong evidence that social relationships benefit the health of older adults, including a reduced risk of mortality (Holt-Lunstad, Smith, & Layton, 2010; House, Landis, & Umberson, 1988), better chronic illness management (Gallant, 2003), improved cognitive functioning (Seeman, Lusignolo, Albert, & Berkman, 2001), and psychiatric morbidity (Bowling & Farquhar, 1991). Given the benefits of social relationships, the maintenance of social relations and “engagement with life” more generally has been recognized as a core component of successful aging (Rowe & Kahn, 1997). Although the importance of social relationships to health has been established (Umberson & Montez, 2010), less is known about the adaptive strategies of older adults with functional limitations to maintain social contact (Thomé & Broese van Groenou, 2006). The health of older adults appears to affect the composition of one’s social network and support received, but much less is known about whether functional status of older adults impacts overall likelihood of social contact across various types of social ties. To date, no research has used nationally representative

longitudinal data to investigate the influence of functional status on subsequent social contact among older US adults.

The lack of such research on functional status and social contact is important given evidence that the causal ordering of other health measures and social relationships are bidirectional—health affects social relationships and social relationships affect health. Indeed, recent evidence in a population of older Europeans suggests that the causal effect of health on participation in social activities is greater than the average causal effect of social participation on health (Sirven & Debrand, 2012). However, Sirven et al. (2012) focused on indicators of social capital (e.g., participation in voluntary work or community organization) rather than social contact per se. Given that functional impairment may have important effects on an individual's ability to maintain social contact, the objective of this research is to test whether functional impairment is associated with likelihood of social contact among U.S adults over the age of 70. To help account for the bidirectional relationship between social relationships and health, this research uses multiple waves from a nationally representative longitudinal data that includes measures of social contact and functional status.

Social Relationships among Older Adults

Participation in social relationships is operationalized in the present analysis as contact with friends or family. Although this operationalization is not without its limitations, including an inability to assess the content of interpersonal interactions, social contact is a prerequisite for the maintenance of social relationships and has been conceptualized in previous research as an indicator of *social embeddedness*—the connections individuals have to significant others such as friends and family (Barrera, 1986). Research on age-related trends in social embeddedness suggests that contact with friends declines even as contact with family increases (Shaw, Krause, Liang, & Bennett, 2007). Numerous theoretical approaches to understanding age related changes in social contact and social relationships, more generally, have been developed (and made obsolete). One of the earliest and most prominent theories was disengagement theory, a functionalist account of declines in social ties as individuals age (Bengtson, Burgess, & Parrott, 1997; Cummings & Henry, 1961). Activity theory developed partly in response to disengagement theory and posited that lifelong maintenance of social relationships and activities was key to later life satisfaction. Although activity theory critiqued disengagement theory for viewing age-related declines in social ties as a universal process, activity theory itself has been criticized for ignoring health and economic factors which could affect the ability and/or desire of older individuals to maintain social activities (Achenbaum, 2009).

More recently, socioemotional selectivity theory (SST) has theorized that variation in the maintenance of social activities among older adults is a function of changing values and perceptions of time, with older adults choosing to maintain or increase involvement in emotionally meaningful relationships (Carstensen, 1995). SST does not suggest that certain ties are inherently more meaningful than others; indeed, friends can oftentimes provide greater emotional satisfaction than family members. However, on average, older adults in the US report closer ties with family than friends, and, as they grow older, report less

frequent contact with friends but relatively stable or increasing levels of contact with family (Aartsen, van Tilburg, Smits, & Knipscheer, 2004; Shaw et al., 2007).

Functional limitations are an important indicator of the health and well-being of older adults—many of whom value functional independence (Dunlop, Manheim, & Sohn et al. 2002). Functional limitations are predictors of chronic conditions (Paterson, Govindasamy, & Vidmar et al., 2004) medical utilization (Stump, Johnson, & Wolinsky 1995) and mortality (Keller & Potter, 1994; Lee, Go, & Lindquist et al., 2008) The importance of functional limitations as a predictor of mortality appears to increase with age; among the oldest old, functional limitations are a better predictor of mortality than chronic conditions, the reverse of what is found among adults aged 50–59 (Lee et al., 2008). The functional status of older adults may also contribute to age related changes in composition of social ties and contact with friends and family, accelerating the process by which older adults selectively retain social contact with kin or other emotionally close relationships (Shaw et al., 2007; van Tilburg, 1998). Past research suggests that older individuals and those in their social networks actively negotiate the quantity and nature of social relationships in the face of changing individual health. Declines in cognitive and physical capacity are associated with an increase in the share of family members relative to neighbors in an individual's social network (Aartsen et al., 2004). Although the relative share of family members in one's social network may increase, absolute levels of social contact may still decrease. Van Tilburg and Van Groenou (2002) found that a decrease in ADL capacity was associated with a decrease in people with whom respondents reported frequent contact (Van Tilburg & Van Groenou, 2002). Despite potential declines in overall levels of social contact among chronically impaired older adults, greater functional disability is associated with an increase in instrumental support received, an increase in the number of family members listed as important, but a decrease in affective support provided by friends (Reinhardt, Boerner, & Benn, 2003). Older individuals with sensory limitations have also been found less likely to have visited friends in the past two weeks (Crews & Campbell, 2004).

Assuming the above patterns of health, aging and social contact between friends and family members are true, SST would predict that in a nationally representative sample, on average, functional impairment would have a lesser effect on likelihood of social contact with family than with friends. Additionally, functional impairment may differentially impact talking on the phone versus getting together socially. Whereas getting together socially requires a higher level of functional status than talking on the phone, talking on the phone may be a useful compensatory mechanism for adults with functional impairment wishing to make social contact. If talking on the phone is used by some older adults as a compensatory mechanism, functional impairment may actually increase the likelihood of talking on the phone with desired social contacts. Drawing from SST and past research that functional limitations are associated with a decline in frequency of social contact generally, it is hypothesized that:

1. Greater functional impairment is associated with a reduced likelihood of getting together with family.
2. Greater functional impairment is associated with a reduced likelihood of getting together with friends.

3. Greater functional impairment is associated with an increased likelihood of talking on the phone with family.
4. Greater functional impairment is associated with a reduced likelihood of talking on the phone with friends.

The possible implications of this research for older adults are (1) a decreased ability to fully engage in social relationships among adults with functional impairment even as the desire for social contact remains unchanged; and (2) a differential impact of functional status on social contact by form of social contact (getting together versus talking on the phone).

Methods

Data

Data come from the Second Longitudinal Study on Aging (LSOA II), a nationally representative sample of 9,447 non-institutionalized individuals living in the US aged 70 and over at baseline in 1995. Institutionalized individuals were defined as those living in a nursing or convalescent home and did not return home during the interview window. Those living in retirement homes, supervised apartments, or assisted living facilities were not considered institutionalized (National Center for Health Statistics [NCHS] 2002). The baseline for the Second Longitudinal Study on Aging is the Second Supplement on Aging (SOA II), a supplement in the 1994 National Health Interview Survey (NHIS). The NHIS uses a multistage complex sample design, and individuals 70 years or older in the NHIS core were included in the SOA II (NCHS 2002). Follow-up surveys were conducted by trained telephone interviews in 1997–1998 and 1999–2000. Overall response rates in Waves 2 and 3 were 84.7% and 68.4%, respectively. Only community dwelling adults were eligible for the LSOA II baseline interview; however, follow-up interviews were conducted regardless of residence type. For the analysis, respondents who were institutionalized by Waves 2 ($n=226$) or 3 ($n=311$) were coded as attrited and modelled as a competing outcome.

Missing data was handled via multiple imputation using the SAS PROC MI and MIANALYZE procedures. All variables included in the analysis were used to impute eight datasets. Because attrition due to mortality or ineligibility was modelled as a competing outcome in the statistical analysis, missingness on the outcome measures was solely due to a “don’t know” response or non-response. Imputation results for the outcome measures were rounded to the nearest category to meet the requirements of the multinomial logistic regression. Proportion missing for each variable at baseline prior to imputation is reported in Table 1. There were 9,447 respondents at baseline, and 7,838 respondents alive at wave 2, for a total of 17,285 observations used in the analysis. Individuals who attrited between waves 1 and 2 contributed data to the imputation process for individuals with missing data on independent variables but did not attrit. Although the choice of strategy for handling decedent data in the imputation process may affect final statistical results, it is unlikely to substantially alter results in the present analysis given the relatively low levels of missing data of non-decedents and single wave of data imputed with decedents (Ning, McAvay, Chaudhry, Arnold, & Allore, 2013).

Measures

Social Contact

Four questions are used to assess social contact. Respondents were asked if, in the past two weeks, they had gotten together socially with 1) any family other than those with whom they lived; and 2) friends or neighbors. Respondents were also asked if, in the past two weeks, they had talked on the phone with 3) any family other than those with whom they lived; and 4) friends or neighbors. Responses were dichotomously coded (1=yes) and measured in waves 2–3.

Functional Status

Functional status is measured in waves 1 and 2 using activities of daily living and instrumental activities of daily living. Performance of activities of daily living was assessed by asking respondents whether or not they had any difficulty with the following activities: bathing or showering, dressing, eating, getting in and out of chairs, walking, or using a toilet. Performance of instrumental activities of daily living was assessed by asking respondents whether or not they had any difficulty with the following activities: preparing meals, grocery shopping, managing money, doing heavy housework, light housework, and managing medications. Number of IADLs and ADLs were summed in an index and entered as a time-varying predictor of social contact. Higher scores indicate greater functional limitation. Spector and Fleishman (1998) provide statistical justification for a simple sum of IADL/ADL responses to assess functional limitation. Because one of the measures of IADLs includes difficulty using the phone (related to an outcome of interest), this question is extracted from the overall index of functional limitations and used as a control in models predicting social contact via the phone. For individuals who reported having difficulty using the phone, their overall functional limitation score is thus reduced by one in models that predict social contact via the phone.

Covariates

LSOA II includes a number of other demographic and health measures that potentially affect social contact with friends, neighbors, or family. Previous research has shown marital status to be related with informal social participation, thus marital status at waves 1 and 2 (married, widowed, divorced/separated, never married) is included in the model as a time-varying variable (Utz, Carr, Nesse, & Wortman, 2002). Respondents with greater numbers of children or siblings may also be more likely to talk to relatives on the phone during the observation interval, thus number of living siblings and number of living children at waves 1 and 2 are included as time-varying predictors of social contact. Respondents who report having more than 22 children at baseline are treated as missing in the analysis ($n=3$).

Characteristics of the respondent's living arrangements are likely associated with social contact, thus time-varying variables for whether or not the respondent lives in an independent setting (1=yes) and lives with their spouse (1=yes) in waves 1 or 2 are included in the model. Non-independent living arrangements included living in a single family house, townhouse, or apartment that was part of retirement community, living in a supervised apartment, group home, halfway house, personal care or board and care home,

developmental center, assisted living facility, nursing or convalescent home, or retirement home.

At baseline, the LSOA also included a question about geographic proximity to relatives other than children or a spouse. From this measure a time-fixed control variable is included in the model indicating if at baseline the respondent lived less than an hour away from relatives other than children or their spouse, lived with relatives other than children or their spouse, lived less than an hour away from relatives other than children or their spouse, or whether or not they had no living relatives other than children or spouse. Geographic proximity to children can be inferred at each wave, and a time-varying measure of proximity to children is included in analyses

Because of the potential influence of age, sex, race, marital status, educational attainment, income, and health conditions other than functional status on measures of social contact, these variables were additionally included in the analysis. Age is entered into the model as age in years at baseline, sex is dichotomously measured ('1'=female), race is dichotomously measured ('1'=white), education is measured as years of education, and income is treated as a continuous variable in the analysis with a range from 1–28, with '1' being less than \$1,000 and '28' being more than \$100,000 dollars. Self-rated health (1–5) at waves 1 and 2 is included as a time-varying variable in the model, with higher scores indicating better health. Frequency of feeling sad or in the past year is included in the model as a time-varying dummy variable. Respondents were asked how often, in the past 12 months, they felt sad or depressed (all of the time, some of the time, a little of the time, none of the time). These categories were collapsed into a dichotomous variable with a value of '1' indicating a respondent felt sad or depressed "all of the time." Number of chronic condition ever had at baseline was measured as a sum of high blood pressure or hypertension, diabetes, cancer or a malignant tumor of any kind, bronchitis, heart attack, coronary heart disease, angina, congestive heart failure, or other heart problems, and stroke. Quadratic terms for chronic conditions and functional status were included in the model to test for possible non-linear associations with likelihood of social contact.

Data Analysis

Data come from three waves (w) of data collected over six years. Models are estimated using a multinomial discrete time event history analysis framework. These models can be used to estimate the likelihood of an event occurring between wave w and $w+1$. The present analysis estimates the likelihood of social contact at $w+1$, given the independent variables entered at wave w . All time-varying variables are lagged by one wave, thus independent variables at time w are used to predict likelihood of social contact at time $w+1$. Importantly, lagged independent variables help reduce the risk of endogeneity due to reverse causation. For the present analysis, this is the risk that declines in social contact influence functional status rather than vice versa. By including lagged indicators of functional status, it is more likely that the observed association between functional impairment and social contact occurs in the hypothesized direction—from functional impairment to social contact, as it is not possible for social contact at wave w to effect health in a prior wave. However, it is still possible, and likely, that unmeasured social contact was associated and occurred causally

prior to controls for functional health. This analysis, therefore, reduces but does not eliminate the possibility that the observed association between health and social relationships is due to the causal effects of social relationships.

The LSOA II collected three waves of data and the likelihood of social contact can be estimated across two intervals (between wave 1 and wave 2, and between wave 2 and wave 3). In event history modeling, the discrete time approach can handle temporal variation in the hazard rate of an event occurring (i.e., time trends in the likelihood of an event occurring not related to variables included in the model) by including dummies for the time interval in the model (Allison 1995). Because there are only two intervals available in the LSOA II, a dummy variable is included in all analyses for interval 1. In order to test whether for a m

A risk group must also be identified for event history analysis. The risk groups used in all analyses are living individuals who responded to the survey at wave $w-1$, where w is the wave for which likelihood of social contact is estimated. Positive coefficients represent an increased likelihood of social contact for any given interval. Attrition due to mortality and ineligibility (institutionalized at follow-up) was included as a competing outcome in both analyses to help account for attrition. Four models are estimated: (1) likelihood of getting together with family; (2) likelihood of talking on the phone with family; (3) likelihood of getting together with friends or neighbors; and (4) likelihood of talking on the phone with friends or neighbors.

Results

Table 1 presents descriptive statistics for the sample at baseline from which the risk group is identified. 76% of respondents reported getting together with relatives and 71% reported getting together with friends. As would be expected, a slightly higher percentage of respondents reported talking on the phone in the past two weeks: 86% of respondents talked on the phone with relatives and 80% talked on the phone with friends. The average number of functional limitations was 1.73 (SD=3.20). At baseline, 60% of the sample had no functional limitations, 12% had 1 functional limitation, 6% had 2 limitations, and the remaining 22% had 3 or more limitations. At the high end of the scale, less than 1% had 14 functional limitations (N=65). The majority of the sample was white (88%) female (61%) and had an average age of 77.4 years.

Social Contact with Relatives

Table 2 presents results from models estimating the likelihood of social contact with relatives via the phone or by getting together. Functional status was inversely associated with likelihood of social contact by getting together (OR=0.97, $p<.01$) and talking on the phone (0.96, $p<.01$). Marital status was also significantly associated with social contact with relatives. Being divorced/separated (OR=0.60, $p<.01$) was associated with a reduced likelihood of getting together with relatives. Compared to those who lived with relatives other than spouse or children, individuals with no living relatives other than spouse or children were also less likely to get together with relatives (OR=0.77 $p<.05$). Being white, (OR=1.22, $p<.01$), having more years of education (OR=1.05, $p<.01$), having more children (OR=1.10, $p<.01$) living siblings (OR=1.05, $p<.01$), and having relatives live less than an

hour away (OR=1.69, $p<.01$) were associated with an increased likelihood of getting together with relatives. Respondents with a mental disorder or senility at baseline were less likely to get together with relatives (OR=0.61, $p<.05$).

For social contact with relatives via talking on the phone, being older (OR=0.98, $p<.01$) or never married (OR=0.66, $p<.05$) were associated with a reduced likelihood of phone contact. Compared to those who lived with relatives other than spouse or children, individuals with no living relatives other than spouse or children were also less likely to talk on the phone (OR=0.76, $p<.05$). Being female, (OR=2.06, $p<.01$), having more years of education (OR=1.10, $p<.01$), greater income (OR=1.02, $p<.01$) more living children (OR=1.09, $p<.01$) or living siblings (OR=1.05, $p<.01$) were associated with an increased likelihood of phone contact with relatives. Compared to adults who lived with relatives other than a spouse or child, those who did not live with relatives but had relatives live less than an hour away (OR=1.41, $p<.01$) or more than an hour away (OR=1.38, $p<.01$) were more likely to talk on the phone with relatives, suggesting that adults who live with relatives other than a spouse or child tend to have social contact limited to those with whom they live. For other health conditions, having a mental disorder (OR=0.49, $p<.01$) or difficulty using the phone (OR=0.32, $p<.01$) were associated with a reduced likelihood of talking on the phone, while number of chronic conditions ever had was associated with an increased likelihood of talking on the phone with relatives (OR=1.08, $p<.05$).

Social Contact with Friends

In models estimating social contact with friends, functional status was inversely associated with likelihood of social contact with friends both via the phone (OR=0.93, $p<.01$) and by getting together (OR=0.94, $p<.01$). Being older (OR=0.97, $p<.01$) or living in an independent setting (OR=0.71, $p<.01$) were the only variables associated with a decreased likelihood of getting together with friends other than functional status. An increased likelihood of social contact with friends via getting together was associated with being white (OR=1.38, $p<.01$) having more years of education (OR=1.09, $p<.01$), higher income (OR=1.02, $p<.01$) or being widowed (OR=1.23, $p<.05$). Compared to adults who lived with relatives other than a spouse or child, those who did not live with relatives but had relatives live less than an hour away (OR=1.36, $p<.01$) or more than an hour away (OR=1.32, $p<.01$) were more likely to get together with friends. As it did for contact with relatives, this suggests that adults who live with relatives other than a spouse or child tend to have social contact limited to those with whom they live. Regarding other health measures, better self-rated health was associated with an increased likelihood of getting together (OR=1.21, $p<.01$).

Regarding contact with friends via the phone, a decreased likelihood of social contact was associated with being older (OR=0.97, $p<.01$), white (OR=0.63, $p<.01$), number of children (0.97, $p<.05$), having a mental disorder (0.62, $p<.01$) and difficulty using the phone (OR=0.36, $p<.01$). An increased likelihood of talking on the phone with friends was associated with being female (OR=1.94, $p<.01$) and having more years of education (OR=1.12, $p<.01$) or higher income (OR=1.01, $p<.05$). Compared to adults who lived with relatives other than a spouse or child, those who did not live with relatives but had relatives

live less than an hour away (OR=1.58, $p<.01$) or more than an hour away (OR=1.50, $p<.01$) were more likely to talk on the phone with friends. Having better self-rated health was associated with an increased likelihood of phone contact (OR=1.12, $p<.01$), as was number of chronic conditions ever had (1.05, $p<.05$).

Conclusions

Results indicate that functional limitations affect the frequency of social contact among older adults with friends and family. Number of functional limitations was associated with a decreased likelihood of social contact with friends either via getting together or talking on the phone. Likewise, functional limitation was association with a decreased likelihood of social contact with relatives both via getting together or talking on the phone. Drawing from SST, it was hypothesized that increased functional limitation would be associated with a reduced likelihood of social contact with friends but not family or relatives. Although results did not support this hypothesis, it is not necessarily evidence against SST. A significant limitation of this research is the lack of measures of emotional closeness; as such, there may be sufficient variation in emotional closeness across friends and family that stratifying analyses by these two relationship types does not adequately control for emotional closeness of ties, even at the population level. A related limitation is the lack of a measure of desired level of social contact, which likely varies across individuals and groups. This paper generally assumes that lack of social contact over a two-week period is undesirable. Yet for some individuals, a desirable level of social contact may be less frequent than two weeks. Indeed, the data does not include a measure of who initiated the social contact, whether the social contact was desired by the respondent, or with whom the contact is directed. Daily calls from a friend or spouse *seeking* social contact may be undesirable for some. It would thus be preferable to model declines in social contact *relative* to desired level of social contact.

Although functional status was associated with declines in getting together with both friends and family, slightly different patterns of association were found for self-rated health and chronic conditions. Self-rated health followed a pattern closer to what would be hypothesized by socioemotional selectivity theory: poorer self-rated health was associated with a decreased likelihood of social contact via getting together or talking on the phone with friends, but not associated with reduced likelihood of getting together with family. If on average, social ties with family are more emotionally meaningful for older adults than social ties with friends, it suggests adults with poorer self-rated health may be more selective with whom they maintain contact, and are physically able to maintain social contact. Number of chronic conditions ever had exhibited an unexpected association with likelihood of social contact: for both friends and family: greater number of chronic conditions ever had was associated with an increased likelihood of contact on the phone, and was not associated with getting together. Past research has generally focused on the impact of specific chronic conditions on social participation, and suggests that social network size is not associated with any specific chronic condition (Penninx et al., 1999). The present findings suggest that, on average, the experience of chronic illness may actually lead to increases in social contact, controlling for functional status. Given that chronic conditions, especially cerebrovascular disease, arthritis, and coronary heart disease, are important predictors of functional

limitation (Boult, Kane, Louis, Boult, & McCaffrey, 1994), future research should continue to explore how chronic conditions influence social participation, and functional ability as an important pathway through which chronic conditions adversely affect social contact. Additionally, the present analysis assumes that the relationship between functional limitations (and chronic conditions) and social contact is monotonic; however, the relationship may vary across the continuum of health statuses. In models that included quadratic terms for talking on the phone with friends or relatives, and getting together with friends or relatives, there was no evidence of a non-linear association between functional limitations and likelihood of social contact.

Given these findings, and the known importance of social relationships to the health of adult adults, how might the impact of functional limitations on social contact be mitigated? It was initially suggested that older adults may be able to compensate for reduced functional ability by using the phone to maintain or increase social contact with close ties. No evidence of such compensation was observed, indicating a broad impact of functional limitations on older adults' ability to maintain social contact. These findings have direct implications for older adults today, who have and increasing array of communication technologies available. It has been suggested that the impact of poor health on social ties could be lessened by the rapid increase in the availability of new communications technologies, including cellphones and the internet (Cotten, 2013). Adoption of these technologies among older adults has been rapid. In 1996, only 2% of Americans over the age of 65 used the Internet, but by 2004 22% of Americans over the age of 65 did so (Fox, 2004). By 2009, an estimated 45% of Americans over the age of 65 used the internet, representing a 2100% increase since 1996 (Keenan 2009). Such a rapid increase in the use of a tool as versatile as the Internet has likely had an array of influences on Americans, including their frequency of social contact with friends and family. Indeed, 75% of older adults report the top motivation for getting online is to make it easier to communicate with family and friends.

Unfortunately, data from LSOA II was collected prior to wide availability of internet access among older adults, and future research should consider whether social contact via the internet or other technologies is also adversely affected by functional limitations. Although social contact via the internet may be less affected by functional limitations, it remains uncertain whether such contact actually improves social well-being among older adults. Observational studies suggest that adults who use the internet are less likely to be depressed compared to adults who did not report internet use (Shelia R. Cotten, Ford, Ford, & Hale, 2014). However, experimental studies on the protective effect of internet use on social contact and loneliness have been mixed to negative (Slegers, van Boxtel, & Jolles, 2008; White et al., 2002), perhaps due to the limited social network of older adults enrolled in the trials.

Despite the increasing availability and adoption of internet technologies to aid social communication, the majority of older adults continue to use phones for social contact. 77% of older adults report using a cellphone in 2014 (Pew Research Center [PRC], 2014), and 91% report having a landline telephone in 2011, compared to 32.4% of adults aged 15 to 29 (US Census Bureau 2011). For many adults, then, the technology of social contact remain similar, but not identical, to those of adults in the LSOA II. Insofar as cellphones have a

greater health barrier to use than landline phones, cellphone use may select for healthier older adults and poor health may have a stronger negative impact on phone contact than observed in the LSOA II cohort. To what degree new forms of communication will displace or complement traditional phone communication remains to be seen. Instrumental social support is itself a prerequisite for many older adults to leverage new technologies as a tool of communication: 77% of older adults report they would need someone to help them learn to use new technologies, such as the internet or tablets (PRC 2014).

Other factors associated with social contact included educational attainment and sex. Higher education was consistently associated with an increased likelihood of social contact, consistent with previous research which finds lower education to be associated with reduced levels of contact with friends among older adults (Shaw et al., 2007) and larger social networks among men and women with more than a high school degree (Ajrouch, Blandon, & Antonucci, 2005). In line with the previous discussion of communication technology, technology adoption is higher among older adults with more years of education and greater income, and insofar as these technologies allow older adults to maintain greater levels of social contact, class inequalities in social participation may grow among older adults.

Being female was also strongly associated with an increased likelihood of social contact, consistent with previous research finding that older men have less frequent contact with kin or friends (Shaw et al., 2007). Regarding family characteristics, not living with relatives was associated with an increased likelihood of social contact, likely due to the nature of the question asked in the LSOA II. Respondents were specifically asked about getting together socially or talking on the phone with relatives other than those with whom they lived. Respondents who lived with relatives likely had most of their social interaction with these relatives, and this type of interaction was not measured by the LSOA II.

Strengths of this study include the use of nationally representative longitudinal data, increasing the generalizability and internal validity of analyses which find that functional limitations are associated with decreased social contact. Nonetheless, in addition to the limitations already discussed, results must be viewed in the context of additional limitations. The operationalization of social contact is rather crude as respondents are only asked about talking on the phone or getting together socially in the past two weeks. Respondents may rely on different definitions of what constitutes social contact when responding to this question, with some respondents including occasions when instrumental support is provided as “getting together socially”, while others may rely on a more narrow definition. Although the LSOA II asks respondents more specific questions about potentially social activities such as going to the movies or a sporting event, it is not possible to determine whether these activities included social interaction with a friend, neighbor, or relative.

If respondents tend to have more inclusive definitions of what constitutes social contact, the effect of poor health on social contact *per se* may be underestimated, as respondents might include interactions with others that an outside observer might not consider primarily “social” in nature (e.g., interactions that include instrumental support). On the one hand, more precise measures of social contact—to the exclusion of other episodes where the primary purpose is non-social, would allow for a more accurate estimate of the effect of

poor health on older adults' social contact *per se* and perhaps provide a better test of SST. On the other hand, a possible strength of the measure of social contact used in the analysis is that it allows respondents to define "social" for themselves. The *perception* of contact with others as social, in which the primary purpose of contact may not appear social to an outside observer, may indicate that respondents ascribe emotional value to the relationship. Allowing for such "subjective" self-reports of social interaction may be one way to measure the emotional meaningfulness of relationships given the lack of more explicit measure of emotional closeness.

Given that the great majority of respondents indicated some sort of social contact at baseline, this measure is likely too broad to distinguish between low and high levels of social contact. Another limitation is the lack of a time varying measure of geographic proximity to relatives. Some variation in contact with relatives is likely due to changing geographic proximity with relatives, especially given the six year period of observation. Finally, the follow-up sample is selected for ability to answer the telephone, an important consideration given its centrality to one of the outcomes of interest. Those respondents not able to answer the phone are likely to have additional functional limitations, thereby biasing the sample to individuals with slightly lower levels of functional limitation. Nonetheless, the nature of this limitation underscores the central contention of this paper—greater functional impairment is associated with reduced likelihood of social contact, and the failure to include these respondents may underestimate the negative association between functional limitation and social contact.

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Biography

Gregory Pavela is post-doctoral fellow at the University of Alabama, Birmingham. His research interests include obesity and the health and aging of older adults, with an emphasis on life course processes and socioeconomic status.

Table 1

Descriptive Statistics of Analytic Sample at Baseline, Longitudinal Study of Aging II, 1994–2000. N=9,447

Variable	Mean (SD)	Range	% Missing
<i>Social Contact</i>			
Get Together with Relatives	0.76 (0.43)	0–1	0.7
Get Together with Friends	0.71 (0.46)	0–1	0.6
Talk on Phone with Relatives	0.86 (0.35)	0–1	0.9
Talk on Phone with Friends	0.80 (0.40)	0–1	0.8
<i>Key Independent Variables</i>			
# Functional Limitations	1.73(3.2)	0–14	0.4
<i>Demographics</i>			
Female	0.61(0.49)	0–1	0.0
Age	77.37(5.79)	70–99+	0.0
White	0.88(0.33)	0–1	0.0
Years of education	11.03 (3.56)	0–18	2.0
Income	16.5(7.6)	1–28	24.3
<i>Marital Status</i>			
Married (ref)	0.53(0.50)	0–1	0.6
Widowed	0.38(0.46)	0–1	-
Div./Separated	0.05(0.23)	0–1	-
Never Married	0.04(0.19)	0–1	-
<i>Family and Housing Characteristics</i>			
# Children	2.71(2.28)	0–22	1.46
# Siblings	2.06(2.30)	0–44	2.43
Independent Housing	0.93(0.26)	0–1	0.1
Lives alone	0.34(0.47)	0–1	0.0
Lives with spouse	0.54(0.50)	0–1	0.0
<i>Proximity to Relatives (not spouse or children)</i>			
Lives with relatives (ref)	0.24(0.45)	0–1	8.0
Relatives live < 1 hour	0.37(0.51)	0–1	-
Relatives live > 1 hour	0.27(0.46)	0–1	-
No relatives besides child, spouse	0.12(0.33)	0–1	-
<i>Proximity to Children</i>			
Lives with child (ref)	0.15(0.37)	0–1	5.7
Child live < 1 hour	0.50(0.51)	0–1	-
Child live >1 hour	0.21(0.42)	0–1	-
No living children	0.14(0.35)	0–1	-
<i>Health</i>			
Difficulty Using Phone	0.05(0.22)	0–1	1.3
Self-rated Health	3.16(1.12)	1–5	1.5
# Chronic Conditions Ever at Baselines	1.76(1.28)	0–7	4.4
Mental Disorder/Senility (baseline)	0.02(0.12)	0–1	0.6

Table 2

Results from a Multinomial Regression Estimating Likelihood of Social Contact with Relatives, Longitudinal Study of Aging II, 1994–2000

Variable	Get Together	Talk on Phone
	OR (95%CI)	OR (95%CI)
# Functional Limitations	0.97(0.96–0.99) **	0.96(0.93–0.98) **
Demographics		
Female	1.10(0.99–1.22)	2.06(1.81–2.34) **
Age	1.00(0.99–1.00)	0.98(0.96–0.99) **
White	1.22(1.06–1.40) **	0.83(0.69–1.00)
Years of education	1.05(1.03–1.06) **	1.10(1.08–1.12) **
Income	1.01(1.00–1.02)	1.01(1.00–1.03) **
Marital Status		
Married (ref)		-
Widowed	0.86(0.69–1.08)	0.79(0.59–1.05)
Div./Separated	0.60(0.45–0.79) **	0.71(0.49–1.01)
Never Married	1.01(0.73–1.40)	0.66(0.45–0.99) *
Family and Housing		
# Children	1.10(1.07–1.13) **	1.09(1.05–1.13) **
# Siblings	1.05(1.02–1.07) **	1.05(1.02–1.08) **
Independent Housing	1.29(1.09–1.51) **	1.14(0.93–1.41)
Lives alone(ref)		-
Lives with spouse	0.86(0.70–1.07)	0.78(0.59–1.02)
Baseline proximity to Relatives		
Lives with relatives (ref)		-
Relatives live < 1 hour	1.69(1.47–1.97) **	1.41(1.16–1.71) **
Relatives live >1 hour	0.98(0.83–1.16)	1.38(1.12–1.70) **
No relatives	0.77(0.64–0.94) **	0.76(0.60–0.97) *
Proximity to Children		
Children with child (ref)		-
Children live < 1 hour	1.75(1.49–2.05) **	1.59(1.28–1.96) **
Children live >1 hour	0.85(0.71–1.02)	1.64(1.26–2.12) **
No Children	0.68(0.55–0.85) **	0.98(0.75–1.28)
Health		
Self-rated Health	1.04(0.99–1.09)	1.08(1.01–1.15) *
Mental Disorder/Senility	0.61(0.40–0.93) *	0.49(0.31–0.77) **
Chronic Conditions Ever	0.99(0.95–1.03)	1.08(1.02–1.14) *
Phone Difficulty	--	0.32(0.25–0.40) **

	<u>Get Together</u>	<u>Talk on Phone</u>
Variable	OR (95%CI)	OR (95%CI)
Intercept (Social Contact)	−0.32	1.31 *
N Observations	17,285	17,285
−2Log Likelihood	32699.76	29242.76

Notes

*
p <.05

**
p<.01

Table 3

Results from a Multinomial Regression Estimating Likelihood of Social Contact with Friends, Longitudinal Study of Aging II, 1994–2000

Variable	Get Together	Talk on Phone
	OR (95%CI)	OR (95%CI)
# Functional Limitations	0.93(0.91–0.94) **	0.94(0.92–0.97) **
Demographics		
Female	0.95(0.86–1.05)	1.94(1.72–2.19) **
Age	0.97(0.96–0.98) **	0.97(0.96–0.98) **
White	1.38(1.20–1.59) **	0.63(0.53–0.75) **
Years of education	1.09(1.07–1.10) **	1.12(1.10–1.14) **
Income	1.02(1.01–1.02) **	1.01(1.00–1.02) *
Marital Status		
Married (ref)		-
Widowed	1.23(1.01–1.50) *	1.18(0.92–1.53)
Div./Separated	0.88(0.65–1.11)	0.89(0.64–1.23)
Never Married	1.20(0.88–1.63)	0.85(0.59–1.23)
Family and Housing		
# Children	1.00(0.98–1.03)	0.97(0.95–1.00) *
# Siblings	1.00(0.98–1.02)	1.01(0.98–1.04)
Independent Housing	0.71(0.60–0.85) **	0.94(0.77–1.15)
Lives alone(ref)		-
Lives with spouse	1.06(0.88–1.29)	0.98(0.77–1.25)
Baseline proximity to Relatives		
Lives with relatives (ref)		-
Relatives live < 1 hour	1.36(1.17–1.57) **	1.58(1.30–1.91) **
Relatives live >1 hour	1.32(1.14–1.53) **	1.50(1.22–1.84) **
No relatives	1.01(0.83–1.23)	1.19(0.93–1.52)
Proximity to Children		
Children with child (ref)		-
Children live < 1 hour	1.13(0.97–1.32)	1.14(0.98–1.40)
Children live >1 hour	1.34(1.14–1.59) **	1.32(1.05–1.66) *
No Children	1.09(0.89–1.33)	1.13(0.87–1.47)
Health		
Self-rated Health	1.21(1.16–1.26) **	1.12(1.06–1.18) **
Mental Disorder/Senility	0.72(0.46–1.13)	0.62(0.39–0.98) *
Chronic Conditions Ever	1.00(0.96–1.04)	1.05(1.00–1.10) *
Phone Difficulty	--	0.36(0.28–0.46) **
Intercept (Social Contact)	1.00 **	1.67 **

	<u>Get Together</u>	<u>Talk on Phone</u>
Variable	OR (95%CI)	OR (95%CI)
N Observations	17,285	17,285
-2Log Likelihood	33433.59	30986.73

Notes.

*
p <.05

**
p<.01