Social network and mobility improvement among older Europeans: the ambiguous role of family ties

Howard Litwin · Kimberly J. Stoeckel

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Abstract This study examined the social network correlates of improvement in lower extremity mobility among respondents aged 65 and older from the longitudinal sample of the Survey of Health, Ageing and Retirement in Europe. The study focused on those who self-reported having difficulties with four lower extremity functions: (1) walking 100 m; (2) rising from a seated position; (3) climbing flights of steps; and (4) stooping, kneeling, or crouching. Multivariate logistic regression analyses revealed that social networks were variously associated with improvement in lower extremity function at the two-year follow-up. The findings suggest that under certain circumstances, a lack of social support in late life may actually promote mobility improvement. The research also shows that family networks are not always facilitative of mobility improvement. This is in contrast to previously published social network research positing that supportive relationships help foster health and buffer stressors in late life. Family caregivers and social services should keep this in mind when devising treatment plans upon discharge from the hospital and implementing care management plans for frail older persons in the community.

Keywords Mobility · Impairment · Disability · Co-residence · Support

Introduction

This inquiry examines the association between social network—particularly family ties—and improvement from

mobility difficulties among older Europeans. Mobility has been broadly defined as the ability to move oneself within environments, both within the home and expanding out from the home to surrounding neighborhoods and other regions (Webber et al. 2010). The World Health Organization's International Classification of Function, Disability and Health (ICF)—developed in 2001—provides a conceptual framework through which to analyze the relationship between social networks and mobility disability improvements in late life. The ICF posits that health conditions are variously affected by body function and structures, activities and participation, each of which are shaped by environmental factors and personal factors. Interaction between individuals and their environment is considered to be an essential aspect of the scientific understanding of “functioning and disability” (WHO 2002). While the primary focus in the ICF model is on the underlying role of physical health, the impact of contextual factors, such as social network relationships, on functional ability outcomes is also emphasized (Altman 2001).

Specifically, the model portrays disability to be a product of the interplay between physical health and the contextual environments. This mechanism fluctuates across time and according to specific, individual scenarios (Jette 2006). A second relevant component of the model is its emphasis on participation rather than handicap (Altman 2001). Emphasizing participation and activity over handicap introduces more neutral discussions about disability (Fougeyrollas and Beauregard 2001). In addition, it highlights the potential for a positive influence of contextual factors on disability outcomes resulting from increased participation.

Social networks are embedded within the ICF Model framework, categorized as the support and relationship component of environmental factors (WHO 2001). The

Responsible editor: D.J.H. Deeg.

H. Litwin (✉) · K. J. Stoeckel
Israel Gerontological Data Center, Hebrew University
of Jerusalem, Jerusalem, Israel
e-mail: eja@mail.huji.ac.il

social network literature cites two explanations for the effect of social networks on health outcomes; the main effect perspective and the buffering hypothesis. The direct or main effect perspective of networks holds that the very presence of network ties is responsible for the given outcome. Moreover, the direct effect is generally positive. That is, social networks directly and independently contribute to better health and functioning. The alternative buffering hypothesis holds that networks impact health outcomes indirectly, by moderating stress that would otherwise exacerbate one's condition. Here too, the effect is viewed as mainly positive, although networks might also increase stress in certain situations (Cobb 1976; Cohen and Wills 1985; Folkman and Lazarus 1980; Antonucci et al. 2010; Bookwala and Franks 2005; Kawachi and Berkman 2001; Leinonen et al. 2001; Thoits 2011).

Family ties are particularly relevant in the study of the association between social network and health among older people (Allen et al. 2000; Glass et al. 2004; Katz 2009; Ryan and Willits 2007; van den Brink et al. 2004; Webb et al. 2011). Family relations, especially the spouse and adult children, are the most frequently cited members of the networks of older people (Cornwell et al. 2009). Moreover, they are also the ones to whom older persons turn first, for assistance. Family members constitute the principal caregivers of frail older adults (Cantor 1991). Therefore, familial relationships should also influence disability outcomes in late life, directly or indirectly, through the physical and emotional support they provide.

The majority of the literature on disability among older adults tends to address the onset of disability, and particularly its antecedents, correlates, and consequences (Tabassum et al. 2009; van den Brink et al. 2003). Social network research examining the relationship between supportive relationships and disability has also primarily focused on onset. For example, research findings suggest that relationships with family members in late life may be protective against the onset of disability and limitations (Giles et al. 2004; Kriegsman et al. 1997; Lund et al. 2010). Much less attention has been paid to the factors associated with improvement among older persons who have already experienced functional limitations (Janevic et al. 2004). The current investigation addresses this gap in the literature, through exploration of the role of familial social network relationships vis a vis improvements in disability in late life.

For the purpose of the present analysis, we focus upon the correlates of improvement in physical mobility disability as the health outcome of interest. We direct our analysis upon lower extremity function as the measure of improvement in physical mobility disability in our inquiry for several reasons. Lower extremity function is a prime indicator of functional limitation and a key precursor of

subsequent disability (Guralnik and Ferrucci 2003). It is also a measure that can be tapped effectively through self-report (Freedman et al. 2011; Maentz et al. 2007). Mendes de Leon et al. (2005) find it a useful means to capture net changes in mobility from baseline to follow-up. Moreover, Guralnik et al. (2000) maintain that lower extremity function demonstrates consistency across studies of diverse populations. However, it should also be noted that some studies show differences in the report of disability and in performance measures across populations (e.g., Lan et al. 2003; van den Brink et al. 2003).

There is not much literature on the role of social network vis a vis mobility disability and even less on the association between social network and improvement from mobility difficulties. A study of community-dwelling Norwegians, aged 55–79, found that those who had good outdoor walking ability were predominantly men with spouses or partners (Bergland et al. 2010). In contrast, data from the Women's Health and Aging Study in the United States found that living alone had a positive association with walking at least 8 blocks per week (Simonsick et al. 1999). A Dutch study of community-dwelling older people found that living with a partner buffered the association between the presence of one chronic disease and mobility difficulties, but the presence of children and the support received from them did not (Kriegsman et al. 1997). Bisschop et al. (2003) found that differing types of social relationships and the support they provide differentially influence decline in physical functioning in older people with or without chronic disease.

Given the relative lack of definitive literature on the topic, we do not pose specific hypotheses in the current inquiry. Rather we examine the association of social network vis a vis mobility disability as an open question, asking whether family ties are related to improvement in lower extremity function. With the ICF paradigm as the conceptual base of our study, we seek to clarify whether there are social network environmental correlates of lower extremity mobility improvement in late life and, if so, their nature.

Method

The present study analyzed data from the Survey of Health, Aging and Retirement in Europe (SHARE), a longitudinal investigation of the population aged 50 and older (Börsch-Supan et al. 2005). The SHARE questionnaire elicits information on a wide range of variables that extend from physical functioning through financial status and social networks. As such, it provides the means to address mobility improvement in a broad context.

The analytical sample in this inquiry is drawn from the longitudinal sample of SHARE ($n = 18,742$) which includes survey participants in both wave 1 (2004) and wave 2 (2006) of the study, from 11 European countries. Analysis of the extent of participation in the first two waves of SHARE showed that after adjusting for death, moving away and other relevant factors, the overall attrition rate from wave 1 (T1) to wave 2 (T2) was 27.9 percent. The rate of attrition ranged across countries, and was highest in Germany (41 %) and lowest in Greece (13 %). Failure to continue survey participation in wave 2 was highest among the youngest age quartile in most countries, those aged 50–58 in wave 1. It was lowest in the two middle quartiles that spanned ages 59–74, and then rose again among respondents aged 75 and older (but less so than among the youngest participants) (Schröder 2008). Calibrated weights are provided by SHARE to help reduce potential selectivity bias resulting from sample non-response and attrition (MEA 2011). The longitudinal version of the calibrated weights were applied in the analytical models of this research.

The SHARE survey contains information pertaining to several indicators of mobility, in general, and lower extremity mobility, in particular. We focus on four measures of the latter that are included in the ICF Model (WHO 2001): (1) walking short distances; (2) rising from a seated position; (3) climbing; and (4) stooping, kneeling, or crouching. Drawing upon work by Weiss et al. (2007), we classified walking as the least demanding of the mobility measures considered here, and the chair stand as the next lowest in terms of physical demand. Climbing stairs was considered by Weiss et al. (2007) to be the most demanding among the mobility measures in their analysis. They did not address stooping, kneeling, or crouching, but the rate of difficulty in this particular mobility measure has been found elsewhere to be about the same as the reported difficulty in relation to climbing stairs (Wisconsin Family Health Survey 1998). As such, climbing stairs and stooping, kneeling, or crouching may be considered to be among the more demanding physical mobility functions. Difficulty in performing the less demanding mobility functions reflects greater mobility limitation, and vice versa.

The current inquiry was limited to respondents age 65 or older ($n = 8,578$) at baseline (T1) to analyze associations specific to persons in this age range. We drew four analytical samples, each of which was comprised of age-eligible longitudinal survey respondents who self-reported having difficulty (i.e., answered “yes”) with the respective lower extremity mobility function at T1. Table 1 describes the four samples used in this study in relation to the overall 65+ sample, as well as the proportion of each sample for which mobility improvement was present. The mobility functions are listed in hierarchical order from less to more

demanding. Improvement was determined as the absence of the corresponding mobility limitation at T2.

Study variables

As noted, we considered four mobility functions. In the SHARE survey, the ability to engage in each of these functions was ascertained through yes/no questions in response to a general introductory inquiry: “Because of a health or physical problem, do you have difficulty doing any of the following activities?” Each of the outcome measures was operationalized as dummy variables that categorized respondents according to self-report of difficulty at T2 for the specific function. Respondents, who reported not having the specified mobility limitation at T2 after having indicated such difficulty at T1, were coded as “1.” This reflected improvement in the respective mobility function between T1 and T2. Those indicating having difficulty at both T1 and T2, in other words answered “yes” both times to the specific mobility question, were coded as “0.” As described in the sample description, respondents without the difficulty at T1 were not included in the corresponding analytical sample.

Four social network variables were addressed in the present study and were measured according to reported characteristics at baseline (T1). The first was whether or not a spouse or partner resided in the same household as the respondent at baseline (yes = 1, no = 0). Second was a dummy variable reflecting whether or not the respondent had any children (yes = 1, no = 0). The third social network variable tapped the frequency of contact with the most contacted child at T1. This ranged from never (1), less than weekly (2), one time per week (3), several times per week (4) and daily (5). The fourth network variable reflected whether a child had co-resided with the respondent at T1 (yes = 1, no = 0).

Several health-related variables, also collected at T1, were entered into the analytical models as additional controls. Activities of daily living (ADL) were entered into the models as a count of six limitations (0–6). Physical health was measured via a count of up to fourteen chronic health conditions such as arthritis, diabetes, hypertension, or heart disease. The maximum number of health conditions found among the respondents in the age 65+ longitudinal sample was ten. A count of physical health symptoms, such as difficulty breathing, chronic pain or edema (0–10) was also entered as a health control variable in the analytical models. Depression was measured as a count of depressive symptoms as recorded on the EURO-D depression scale (0–12) (Ploubidis and Grundy 2009). Body mass index (BMI) was also included to control for the effect of body weight on activity and mobility. The BMI groupings identified respondents as normal (<24.9), overweight

Table 1 Mobility limitations at T1 and corresponding improvement at T2

Lower extremity mobility functions	Analyses samples			
	Difficulty at T1		Improved from T1 to T2	
	<i>n</i>	% of 65+ sample (<i>n</i> = 8578) (%)	<i>n</i>	% of analysis sample (%)
Walking 100 m	1,122	13.1	415	37.0
Rising from seated position	1,898	22.1	793	41.8
Climbing multiple flights of stairs	2,977	34.7	785	26.4
Stooping, kneeling, crouching	3,148	36.7	901	28.7

Mobility functions listed in hierarchical order from less to more demanding

(25–29.9) or obese (30 or higher) and were based on the SHARE generated BMI categorical variable (Peytremann-Bridevaux and Santos-Eggimann 2008). In addition, cognitive status was controlled for in the statistical models with a variable that combined the scores on two memory measures incorporated in SHARE—immediate and delayed word recall counts (0–20). Lower values on the cognitive status variable reflect poorer cognitive functioning (Ayalon et al. 2010).

The sociodemographic control variables addressed in the analysis were age, gender, education, and household income, all of which were gathered at T1. Age was entered into the analyses as a continuous variable. Gender was dichotomous (female = 1, male = 0). Highest level of education attained was grouped into three categories distinguishing between primary, secondary, and post-secondary education according to the standardized coding of the International Standard Classification of Education (ISCED-97) utilized by SHARE. The income value, in Euros, was based upon household income adjusted for purchasing power parity, by country. The income values were divided into quintiles at the following cut off points, calculated on the full longitudinal SHARE sample: lowest: ≤€19,230, mid-low: €19,231–€28,909, mid: €28,910–€44,498, mid-high: €44,499–€77,178, and highest: €77,179+. In addition, country differences were controlled for with the inclusion of country dummy variables. However, we note that specific country differences were not the focus of the current inquiry.

The weighted univariate descriptives of the independent variables are described in Table 2. Variable descriptions are provided for the 65+ longitudinal SHARE sample in addition to the descriptive for each of the four samples used in the analytical models of the study.

Analysis

The analysis included initial univariate descriptions of the outcome variables, the social network indicators and the control variables. The bivariate associations of the outcomes with the selected sociodemographic, health-related

and social network variables were examined next. Finally, a series of multivariate logistic regressions was performed in which T2 improvement in the respective mobility function was regressed upon the entire collection of study variables. All analyses were performed using calibrated weighted data.

Results

The weighted univariate results in Table 2 show that the average age was about 76 in the age 65+ longitudinal sample from which the four individual analytical samples were drawn. Women made up more than half the respondents. Close to two-thirds of respondents had only primary education and about half of the sample were in the lowest income quintile (calculated on the entire SHARE sample). Some 60 percent had a spouse or partner in the household. About 15 percent co-resided with children while about 12 percent were childless. Frequency of contact with the most contacted child was relatively high, that is, several times per week. The weighted distributions also show that some four fifths of the analytic sample lived in Germany, Italy, France, or Spain.

The univariate results also reveal that those who had any kind of mobility difficulty were different from the overall 65+ sample distribution. That is, persons with a mobility impairment were older, more frequently women, with lower education, lesser income, and more health conditions or limitations. Among the social network variables, those with mobility impairments were less likely to reside with a spouse or partner, but were largely similar to the overall 65+ sample on measures pertaining to children and contact with children. Comparisons between the four individual analytical samples distinguishing between the different types of mobility impairments reveal many similarities between three of the subgroups; rising from a chair, climbing stairs, and stooping or kneeling. However, several notable distinctions emerged in characterizing the sample inclusive of those reporting difficult walking. In contrast to those with other mobility impairments, survey respondents with difficulty walking at T1 were older and in poorer

Table 2 Respondents' background, health characteristics and country univariate descriptives by lower extremity mobility function samples

Variables	65–95 sample (<i>n</i> = 8,578) % or mean (sd)	Walk sample (<i>n</i> = 1,122) % or mean (sd)	Rising sample (<i>n</i> = 1,898) % or mean (sd)	Stairs sample (<i>n</i> = 2,977) % or mean (sd)	Stoop sample (<i>n</i> = 3,148) % or mean (sd)
Germany	27.4 %	26.4 %	32.6 %	26.9 %	29.3 %
Austria	2.4 %	1.6 %	2.7 %	2.3 %	2.1 %
Sweden	2.8 %	1.2 %	2.6 %	1.9 %	2.7 %
Netherlands	4.1 %	2.9 %	2.9 %	2.8 %	2.6 %
Spain	13.4 %	13.6 %	15.0 %	13.6 %	13.5 %
Italy	21.2 %	28.1 %	22.0 %	24.2 %	23.3 %
France	17.9 %	17.7 %	13.7 %	18.3 %	17.0 %
Denmark	1.4 %	1.0 %	1.1 %	1.0 %	1.0 %
Greece	4.0 %	3.9 %	3.4 %	5.8 %	3.9 %
Switzerland	2.1 %	0.8 %	1.6 %	0.9 %	1.6 %
Belgium	3.2 %	2.7 %	2.5 %	2.4 %	2.9 %
Age	75.79 (6.64)	79.74(6.96)	77.21(6.61)	77.73(6.86)	77.32(6.80)
Female	58.4 %	72.3 %	70.0 %	68.8 %	68.8 %
Primary education	62.5 %	77.8 %	67.3 %	70.8 %	68.2 %
Secondary education	24.3 %	18.2 %	23.0 %	21.3 %	22.4 %
Post-secondary education	13.2 %	3.9 %	9.7 %	7.8 %	9.4 %
Household income: low	46.8 %	59.8 %	54.4 %	53.4 %	51.5 %
Household income: mid-low	21.7 %	18.5 %	21.3 %	21.6 %	21.9 %
household income: middle	16.2 %	9.8 %	12.2 %	12.3 %	13.8 %
Household income: mid-high	9.3 %	7.0 %	7.2 %	7.2 %	7.7 %
Household income: high	6.0 %	5.0 %	4.9 %	5.4 %	5.1 %
ADL limitation count	0.29 (.87)	1.13 (1.57)	0.71(1.32)	0.57(1.17)	0.57(1.17)
Chronic disease count	2.00 (1.55)	2.91 (1.81)	2.77 (1.71)	2.64 (1.68)	2.61 (1.66)
Physical symptom count	1.82 (1.72)	3.11 (1.95)	2.93 (1.89)	2.75 (1.86)	2.66 (1.85)
Euro-D symptom count	2.67 (2.36)	4.23 (2.53)	3.64 (2.55)	3.55 (2.52)	3.48 (2.56)
BMI normal	38.4 %	32.6 %	30.5 %	32.3 %	32.2 %
BMI overweight	43.1 %	36.2 %	43.2 %	40.7 %	41.3 %
BMI obese	18.5 %	31.1 %	26.3 %	27.0 %	26.5 %
Memory	6.78 (3.39)	5.13 (3.05)	6.21 (3.30)	6.09 (3.29)	6.30 (3.34)
Spouse/partner in household	59.7 %	45.0 %	51.9 %	51.3 %	54.6 %
No children	11.7 %	12.7 %	9.8 %	11.1 %	11.8 %
Frequency of contact with child	3.94 (1.38)	3.93 (1.44)	4.04 (1.34)	4.00 (1.36)	3.96 (1.38)
Co-resident child(ren)	15.0 %	15.9 %	15.2 %	15.2 %	14.8 %

health as indicated by higher counts of required ADL assistance, chronic diseases, physical symptoms. Mental health was also more impaired among this subsample with more depressive symptoms being recorded as well as lower cognitive functioning. In regard to social network, a lower proportion of this subgroup lived with a spouse or partner while a higher proportion co-resided with a child.

Bivariate analyses were carried out between each of the independent variables and each of the four mobility outcome improvement measures. The results (available upon request), revealed that all the variables were associated with at least one of the outcome measures, and most were associated with more than one. Consequently, we considered all the independent variables in relation to each of the

mobility improvement measures in the multivariate phase of the investigation.

The multivariate logistic regression results are presented in Table 3. The multivariate findings in relation to walking 100 m are presented in the first column of findings. Three of the four baseline social network variables were associated with the walking improvement outcome at T2. Childless respondents showed a much greater likelihood to have improved in this function, all things considered, while those with co-resident children were much less likely. In addition, frequency of contact with the most contacted child showed a positive association—the greater the contact, the greater the likelihood of walking improvement. Having a spouse was unrelated. Among the control factors, age, ADL difficulties and BMI (obese) were related to improvement in walking ability—all negatively so.

The baseline social network variables were found to be less predictive of improvement in difficulty in rising from a chair after taking into account the effect of background and baseline health (shown in the second column of findings). Only co-residency with an adult child had a borderline negative association with improvement in rising from a chair after sitting for long periods. High income and better memory at T1 predicted improvement in this basic physical mobility function. Age, ADL difficulties, problems with physical symptoms and BMI (overweight and obesity) were all negatively related.

The expected odds of improvement in climbing several flights of stairs are displayed in the third column. Here too, respondents without children were much more likely to have reported improvement in this function, after controlling for the other variables. Frequency of contact with the most contacted child also showed a marginal positive association. However, the variables of co-residence with spouse or children were both unrelated. As for the control variables, most of the baseline health indicators were negatively related to improvement in this particular function at T2. Age was also negatively related. Income level showed an irregular partial association.

The statistics in the final column of findings show the odds of improving from reported difficulties in stooping, kneeling, or crouching for each of the study variables. As may be seen, three of the four baseline social network variables showed a negative association with improvement in stooping, kneeling, or crouching, all else considered. Those with a co-resident spouse were less likely to report improvement in this particular function. Respondents with no children had lower expected odds of reporting an improvement. More frequent contact with children also resulted in lessened odds of improving in this function. As for the control variables, age, gender (women) and lower income were all associated with lower expected odds of improvement, as were the number of baseline ADL

difficulties, overweight and obese BMI and, to a lesser degree, more depressive symptoms and physical symptoms.

Discussion

This inquiry considered the role of social network vis a vis improvement in mobility function among Europeans aged 65 and older. Controlling for the sociodemographic background and health-related factors that are variously addressed in mobility research, we considered selected social network factors vis a vis mobility improvement. Our specific purpose was to assess whether family ties enhance mobility improvement in late-life.

The analysis looked specifically at the factors associated with improvement in four measures of mobility. First of note is that a meaningful proportion of each sample with a difficulty of a lower extremity mobility function at T1 was found to have an improvement in the respective function at T2. The improvements ranged from about a quarter (climbing stairs) to over 40 percent (rising from a chair). Further examination of these findings reveals that two of the lower extremity mobility functions had a lesser extent of reported difficulty at baseline—walking and rising from a seated position, those considered by Weiss et al. (2007) to be the less demanding of the mobility functions considered and, hence, reflective of more serious mobility limitation. The other two functions—climbing stairs and stooping, kneeling, or crouching—had greater rates of baseline difficulty in the current study sample.

Drawing upon the positive association found between social networks and health, in general (Kawachi and Berkman 2001; Leinonen et al. 2001; Thoits 2011), we sought to clarify whether social networks play a positive role vis a vis mobility improvement. The findings provided some support for a positive association, but in other cases, social network variables were negatively related to the improvement outcome. We discuss each of the network variables and their associations with mobility improvement in the following paragraphs, raising possible explanations for the respective outcomes.

First, the variable of childlessness had the greatest number of positive associations. Those without children reported greater likelihood of having improved in walking and climbing stairs. The improvement in these particular mobility functions might be explained in terms of necessity. Not able to count on accessible support from children, the childless were, perhaps, forced to do for themselves. However, childlessness was also associated with lesser probability for improvement in stooping ability, which our findings suggest to be one of the more demanding mobility functions. It seems, therefore, that the lack of social network—in this case children—may promote improvement

Table 3 Expected odds of improvement in basic lower extremity mobility function

	Walking 100 m			Rising from seated position			Climbing stairs			Stoop, crouch or kneel		
	OR	95 % CI		OR	95 % CI		OR	95 % CI		OR	95 % CI	
Austria	1.08	0.35	3.31	0.90	0.48	1.69	0.93	0.51	1.69	1.03	0.57	1.84
Sweden	1.13	0.33	3.84	0.82	0.43	1.56	1.27	0.65	2.50	0.54*	0.31	0.95
Netherlands	0.99	0.43	2.29	1.26	0.68	2.33	1.48	0.87	2.52	1.09	0.65	1.82
Spain	1.89*	1.11	3.21	1.63*	1.12	2.38	2.02***	1.43	2.86	2.06***	1.50	2.82
Italy	0.87	0.56	1.37	1.41*	1.01	1.96	1.32+	0.98	1.78	0.72*	0.54	0.95
France	0.92	0.58	1.45	0.75+	0.53	1.05	0.67**	0.50	0.90	0.62***	0.47	0.81
Denmark	0.86	0.21	3.47	1.02	0.39	2.70	1.44	0.60	3.45	0.78	0.33	1.86
Greece	0.32**	0.13	0.74	0.22***	0.10	0.46	0.09***	0.04	0.19	0.22***	0.12	0.41
Switzerland	1.19	0.28	4.98	1.09	0.49	2.40	1.96	0.80	4.83	0.86	0.45	1.67
Belgium	1.10	0.46	2.60	0.99	0.51	1.91	1.29	0.71	2.34	1.05	0.64	1.74
Age	0.96***	0.94	0.98	0.98*	0.97	1.00	0.94***	0.92	0.95	0.93***	0.91	0.94
Female	0.99	0.71	1.38	0.82	0.65	1.04	0.95	0.77	1.18	0.69***	0.56	0.84
Primary Education	0.95	0.45	2.01	0.88	0.60	1.29	0.89	0.63	1.27	1.37+	1.00	1.89
Secondary Education	1.02	0.47	2.23	1.04	0.71	1.52	1.38+	0.97	1.98	1.18	0.86	1.63
Household Income: Low	1.45	0.85	2.46	0.93	0.66	1.32	0.68*	0.50	0.93	0.77+	0.58	1.01
Household Income: Mid-Low	0.93	0.53	1.65	1.04	0.72	1.48	0.94	0.69	1.28	0.73*	0.55	0.97
Household Income: Mid-High	1.14	0.57	2.27	0.63+	0.40	1.01	0.63*	0.41	0.97	0.76	0.52	1.10
Household Income: High	1.83	0.82	4.04	2.09**	1.21	3.61	1.11	0.71	1.75	1.18	0.77	1.80
ADL Limitation Count	0.72***	0.65	0.80	0.79***	0.72	0.86	0.69***	0.61	0.78	0.78***	0.71	0.86
Chronic Disease Count	0.93	0.84	1.02	0.97	0.90	1.04	0.89***	0.83	0.95	0.98	0.92	1.05
Physical Symptom Count	0.96	0.88	1.06	0.90**	0.84	0.96	0.84***	0.79	0.90	0.91**	0.86	0.97
Euro-D Symptom Count	0.99	0.92	1.05	1.00	0.95	1.04	0.92***	0.89	0.97	0.93***	0.89	0.97
BMI Overweight	0.76	0.54	1.07	0.65***	0.51	0.83	0.91	0.74	1.13	0.63***	0.51	0.77
BMI Obese	0.70*	0.49	1.00	0.53***	0.40	0.69	0.44***	0.34	0.58	0.43***	0.34	0.54
Memory	1.04	0.99	1.10	1.06**	1.02	1.09	1.00	0.97	1.04	1.01	0.97	1.04
Spouse/Partner in Household	1.03	0.74	1.45	1.05	0.83	1.34	1.02	0.82	1.26	0.67***	0.54	0.83
No Children	3.50***	1.76	6.94	1.11	0.66	1.85	2.23**	1.36	3.64	0.49**	0.32	0.76
Frequency of Contact with Child	1.26**	1.07	1.49	1.06	0.94	1.20	1.12+	0.99	1.27	0.80***	0.72	0.89
Co-Resident Child(ren)	0.53**	0.34	0.82	0.76+	0.56	1.03	0.93	0.71	1.23	0.94	0.72	1.22
Sample Size (Nagelkerke R^2)	1,122 (.16)			2,977 (.24)			1,898 (.13)			3,148 (.18)		

Reference Categories: Country (Germany), Education (Post-Secondary), Household Income (Mid), BMI (Normal)

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + < 0.10

from mobility difficulties, but may also restrain such improvement, depending on the mobility function in question.

We should also note a possible biological interpretation behind this last finding. Pregnancy is known to increase the risk of osteoporosis. This might explain the decreased likelihood of mobility improvements in late life among women who have given birth to children, as compared to those who did not. However, this potential explanation applies only to women. It is important to examine whether the same patterns emerge for childless persons of both genders.

Contrary to childlessness (which is reflective of possible network deficits), the frequency of contact with the most

contacted child outside the household variable showed a generally positive association between network and mobility improvement. Those with greater contact had a greater likelihood of reporting better walking mobility at follow-up, and a borderline chance of improvement in climbing stairs as well. This same variable was negatively related to improvement in stooping, crouching or kneeling. It could be that respondents with more frequent contact with a child outside the household received more encouragement than those who were less connected to their offspring. Alternatively, the greater contact might have stemmed from the need to help the children and their families. This, in turn, may have motivated these respondents to overcome their own mobility limitations. At the

same time, the negative association of frequency of contact with improvement in stooping capacity might carry the opposite message. That is, greater visitation by children from outside the household may have reinforced the sense of incapacity.

The third network variable—co-residency with children—was negatively associated with improved walking and had a borderline negative association with rising from a chair after sitting for some time. Both of these functions are less demanding and those who have difficulty performing them may be said to be more seriously limited in terms of mobility. Respondents who co-resided with an adult child may have had little motivation to strive for greater autonomy under these circumstances. This possible dynamic is echoed in the finding from the Women's Health and Aging Study, noted earlier, which showed that living alone had a positive association with walking at least 8 blocks per week (Simonsick et al. 1999). Alternatively, their co-residence with the child may have been motivated by their serious mobility limitation.

Finally, the presence of a spouse or partner was related (negatively) to improvement in one mobility function only—stooping, crouching, or kneeling. The implication is that this network variable hardly enhances or restrains improvement in mobility function. This might stem from two possible spousal reactions to mobility impairment in a partner. There are those who encourage and facilitate improvement, whether through emotional support or other means which push mobility-challenged individuals to overcome their limitations. But there are also spouses who compensate and care for disabled partners, providing instrumental support that obviates the need of care receivers to fend for themselves. This may discourage mobility-challenged individuals from taking the necessary steps to overcome their limitation. The relative absence of associations between having a spouse and mobility improvement in the current study may be explained by the probable presence of both kinds of spousal caring relationships among the study population, effectively canceling out their divergent effects.

Thus, network ties in the current study enhanced mobility improvement to a minor degree only. Moreover, some of the positive associations that emerged actually reflect the absence of social ties, as in the case of the childlessness variable. It seems, therefore, that social networks might possibly hinder improvement from mobility difficulties as often, or even more often, than they facilitate improvement.

Other findings in the current inquiry underscore the importance of better health and functionality for improvement of mobility. This corresponds to similar findings in previous studies (Mantya et al. 2009; Rantanen et al. 1999; Rivera et al. 2008; Shah et al. 2011), but runs opposite to the findings in a study using HRS data

(Feinglass et al. 2009). Another point of note is that the majority of respondents who reported mobility difficulties in T1 came from the lowest income quintile. This observation underscores the association between poor economic state and the onset of physical disability (Broese van Groenou et al. 2003; Clark et al. 2009). Stated differently, those in the higher income categories in the overall study sample were less likely to have experienced initial mobility limitations as measured in T1 in this study. Despite this initial distinction by economic status, however, the current analysis demonstrated that financial state was mostly not a significant factor in relation to mobility improvement. As the study showed, it was the health and social network variables that accounted for almost all of the explained variance in the mobility improvement outcomes.

The current analysis was subject to a number of limitations that should be cited. First, the data were drawn from a general survey that collects information on a wide range of variables. As such, we had to make use of existing variables and were unable to extend the inquiry to include variables that were not addressed in the original survey. Thus, for example, we did not know why respondents reported difficulty walking at T1 and whether any of the respondents had undergone specific rehabilitative therapy in relation to their mobility disabilities. We were also unable to ascertain the specific reason for the contact with the most frequently contacted child.

Another limitation that stems from the dataset is that some countries in the survey had low-to-moderate response rates. We attempted to alleviate this concern through our use of calibrated weights. Nevertheless, there may still be potential biases due to the rates of non-response in certain countries. A third limitation has to do with the varying meanings of co-residence with children in different countries. In some countries, particularly in Southern Europe, such co-residence is still a more accepted tradition (Isengard and Szydlik 2012). In other countries, co-residence with offspring may be more directly related to the needs and/or the disability of the parent (Smits et al. 2010). Given the small number of cases of mobility improvement in some such countries when the weighted sample data were employed, we were unable to address this distinction. Future research should take these issues into account.

Despite these limitations, use of the SHARE data provides three clear advantages. First, it allows longitudinal follow-up of respondents, making it possible to examine the association between preliminary characteristics and later outcomes. Second, SHARE has collected data on a very large sample, which facilitates consideration of phenomena of interest among selected subgroups of older adults, as for example the subject of the present inquiry. Third, the SHARE data come from a wide range of European countries, and their number is increasing with each

subsequent wave. As such, the data collected in SHARE can indeed claim to reflect the circumstances, the opportunities and the challenges that are facing older adults in Europe.

Conclusion

In sum, the findings of the current investigation showed that a significant number of respondents in the sample reported an improvement in their mobility, reminding us that old age is not a singularly downward functional pathway. Many older people show great resiliency and are able to overcome at least some of the mobility limitations that they may face. Thus, the rehabilitative potential of older adults must not be ignored for reasons that are not directly related to their rehabilitative capacity.

We found that social networks, and particularly family networks, were not as facilitative of mobility improvement as one might think. The literature holds that physical and emotional support from the family directly improves health or buffers stressors that exacerbate health limitations. It could be assumed, therefore, that this mechanism works in relation to mobility improvement as well. However, the findings from the current study imply that support provided by caring social network members may actually inhibit independence in older adults if, for example, the assistance provided is greater than is actually required. Help received from social network members may lead to declines in physical mobility if the provided support minimizes the frequency with which the functions must be self-performed by an individual.

Indeed, the findings from the current analysis suggest that some mobility improvement was observed among respondents with indicators of limited social networks. Lacking someone close to do for them, these respondents may have been forced to do for themselves. In this case, necessity seems to foster motivation which, in turn, may promote physical mobility. Our tentative conclusion is that while social networks are important in several areas of late life, they may not tend to facilitate various domains of mobility improvement among older care recipients. Family caregivers and social services should keep this in mind when devising treatment plans upon discharge from the hospital and implementing care management plans for frail older persons in the community.

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