Social relationships and mortality in older adulthood: Social participation, perceived support, social networks and neighborhood characteristics

James Iveniuk and L. Philip Schumm

Previous research has shown that older adults who participate frequently in social organizations have lower mortality than people who participate less often (Musick, Herzog, and House 1999; Agahi and Parker 2008). A number of mechanisms have been proposed to explain this phenomenon. Individuals who participate in social organizations may experience more emotionally satisfying social lives, and perceive their world as filled with more supportive, close relationships (Coleman and Iso-Ahola 1993). Similarly, participation in social organizations can create opportunities for building new, helpful social connections (Krause 2008). It is also possible that the relationship between participation and mortality is spurious, and the result of some unmeasured confounder. Opportunities for social participation may also vary by the characteristics of individuals' neighborhoods, and areas with fewer nearby organizations may also be areas with greater poverty, disorder, and sources of environmental stress leading to mortality (Lochnera et al. 2003). Previous studies have been unable to arbitrate between these accounts, since detailed data on older adults' social relationships are rare.

The present study utilizes a new, innovative dataset to examine simultaneously the association between several different measures of social interaction and mortality, in an attempt to increase our understanding of the underlying mechanisms. The National Social Life, Health and Aging Project (NSHAP) is a longitudinal study utilizing a nationally representative probability sample of older Americans. NSHAP currently includes two waves of data collection, one in 2005/2006, and another in 2010/2011. The first wave included 3,005 respondents, 430 of whom were deceased at Wave 2 (14.3%). NSHAP is unique among national surveys of older adults with respect to the breadth and level of detail with which it measures social factors,

including participation, social support, networks, and neighborhood characteristics. We used logistic regression to predict mortality using social factors. We included as covariates several demographic characteristics, as well as measures of baseline health status, to address the possibility that the positive association between social participation and survival is driven by the selection of healthier individuals into participation. Participation was measured by the number of activities that the respondent participates in once a week or more, composed from three separate variables: attendance at religious services, volunteering, and attending local meetings (examples given to respondent include sports groups, hobby groups, and professional societies). Models were fit using Full Information Maximum Likelihood to accommodate missing data, and results were checked against models fit with listwise deletion.

Results of our analysis are shown in Table 1. We find that several distinct social factors (number of confidants, marriage, closeness to confidants, and disorder) are all associated with mortality, and in the case of social participation, the relationship is both graded and of substantial magnitude. This suggests that there may be multiple mechanisms at work, and demonstrates that distinguishing between these is critical to understanding the impact of social factors on mortality at older ages. The associations between these social factors and mortality persist despite adjusting for several demographic and baseline health covariates, and are remarkably stable across models. Additionally, we tested across cutpoints for our social participation variable (at least once a year, at least once a month, at least once a week), and found that more frequent participation was associated with a larger protective association. We did not find any significant interactions between social participation and the other variables in the model.

Although previous studies have demonstrated an association between increased social participation and survival, it remains unclear which components of participation might be most

relevant. By measuring several different components of social participation among a national probability sample of older adults, this work can help to elucidate the mechanisms linking social relationships to mortality. The strength of the association between participation and survival prompts us to consider alternative explanations that do not work through neighborhoods, networks or perceptions of support. These regressions also adjust for smoking, drinking and physical activity, which suggests that the association does not work through increased social control either. Other work has suggested that the timing of death may be orchestrated by symbolically-meaningful events, such as participation in traditional festivals (Phillips and Smith 1990). It may be that the subjective experience of being needed and giving to others keeps older adults psychologically engaged and physiologically energized, and our full paper will consider the biological mechanisms that might link social factors to mortality (Krause 2009). In addition to expanding this theoretical account, this paper will investigate the differences between the range of activities that a person participates in, and the frequency of their participation. Finally, we will model who participates in different organizations, including their religious affiliation and religiosity, as well as their demographic characteristics.

References

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Table 1. Logistic regression models predicting mortality between Wave One (2005/2006) and Wave Two (2010/2011). Coefficients presented as odds ratios. Regressions fit with FIML (N=3005).

	Model 1	**Model 2**	**Model 3**	**Model 4**
Social Participation (ref=none)				
1 activity/wk	0.70*	0.71*	0.78	0.76
2 activities/wk	0.55*	0.55*	0.59*	0.57*
3 activities/wk	0.32**	0.32**	0.37**	0.37**
Neighborhood Environment				
Resided in neigh. $\geq$ 5yrs		1.08	1.12	1.08
Neigh. % poverty		1.04	1.01	1.00
Neigh. disorder		1.19**	1.15*	1.15*
Connectedness				
Num. confidants			0.85*	0.83**
Time with confidants			0.91	0.93
Network density			0.96	0.98
Married			0.66**	0.64**
Social Support				
Perceived support				1.09
Perceived isolation				0.98
Closeness to confidants				0.82**
Talking about health				1.09
VIF	1.33	1.36	1.39	1.40
Pseudo-R^2	0.29	0.30	0.31	0.31

* p<0.05, ** p<0.01, *** p<0.001

Note: all continuous variables standardized. Regressions also control for gender, age, age squared, race/ethnicity, education, ADLs, comorbidities, depressive symptoms, smoking, alcohol consumption, and physical activity.