

The Effect of Loneliness on Social Networks Over Time: A Study from Singapore

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Abstract

Loneliness at older ages is a significant concern given the higher risk of adverse physical and mental health outcomes among lonely older adults. Although there is considerable research on the predictors of loneliness, relatively few studies have examined the dynamics of social networks in response to loneliness. In this paper we assess how social networks change after older adults report being lonely. We study different aspects of social networks: size (number of close social contacts), strength (frequency of contact), as well as family- and friends-focused networks. We use data from 3 waves of the Panel on Health and Ageing of Singaporean Elderly, a nationally representative study of older adults in Singapore aged 60 years and older, conducted in 2009 ($n=4990$) with follow-ups in 2011 and 2015. We use cross-lagged panel models with fixed effects that estimate the effect of loneliness at time t and $t+1$ on social networks at time $t+1$ and $t+2$, while also accounting for the possibility of reverse causation and auto-regressive relationships, and several time-varying and time-invariant sociodemographic and health characteristics. We find that friends-focused but not family-focused social networks increase initially. However, over time loneliness adversely affects the frequency of contact with both friends and family.

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Extended Abstract

Background

Loneliness among older adults is increasingly recognized as a major public health issue because it has been found to be associated with adverse outcomes such as social isolation, clinical depression, cognitive decline, reduced healthcare utilization, and a higher risk of mortality. Loneliness is defined as a negative feeling or emotion that emanates from the discrepancy between one's desired and actual social relationships. Importantly, loneliness is distinct from social isolation, which refers to a lack or limitation of social ties. Some individuals who have few social ties may not necessarily feel lonely and in contrast, some individuals may feel deficits in their existing social ties even if objectively, they have large social networks.

Despite extensive research on the demographic and health predictors of loneliness at older ages, the dynamics of the social lives of older adults after they experience loneliness is relatively understudied. Previous research suggests the possibility of various types of coping strategies in response to loneliness, ranging from a recalibration of emotions and behaviours (e.g., lowering of expectations about what social ties can yield, regulating emotions, an increase in solitary but interest-based behaviours such as gardening or viewing television) to proactively seeking to bridge perceived gaps in social ties (e.g., volunteering and helping others in need, reaching out to relatives, seeking new friendships, increasing the frequency of contact with relatives and friends).

In this study, we focus specifically on social networks and how they evolve for lonely older adults. Using panel data, we study the effect of loneliness on social networks over time, studying both the size and strength of social networks as well as family- and friends-focused networks.

Data

We utilize data from a nationally-representative longitudinal survey on the physical, mental and social health of community-dwelling older Singapore citizens and permanent residents aged 60 years and older, known as the Panel on Health and Ageing of Singaporean Elderly (PHASE). The data pertain to 3 waves, conducted in 2009 (n=4990), 2011, and 2015. Proxy respondents responded to the survey if the older adult was unable to answer himself/herself because of a physical or mental health limitation; however, proxy respondents were not asked questions about the social networks and loneliness of older adults. The analytical sample in this study was limited to 4612 respondents with data at least two waves. All respondents participated after providing written informed consent and standardized questionnaires were administered by trained interviewers.

We operationalized the dependent variable, social networks, using the Lubben Social Network Scale – Revised (LSNS-R), and limited the analysis to non-cohabiting relatives and friends. The size of social networks was measured through questions asked separately about relatives and friends: how many relatives/friends did the respondent see or hear from at least once a month, how many they felt at ease with to talk about private matters, and how many they felt close to such that they could call on

them for help. Respondents chose from six responses options: none / 1 / 2 / 3 to 4 / 5 to 8 / 9 or more, corresponding to item-level scores of 0 to 5. Strength of networks was measured through questions also asked separately about relatives and friends: how often did the respondent see or hear from relatives/friends with whom they had the most contact, how often would one of their relatives/friends talk to the respondent when the relative/friend had an important decision to make, and how often was one the respondent's relatives/friends available when the respondent had an important decision to make. Respondents were offered six response options: never / seldom / sometimes / often / very often / always, corresponding to item-level scores of 0 to 5. Questions pertaining to relative and friends are utilized to create family- and friends-focused social network dependent variables. All social network variables are used as continuous variables.

The key explanatory variable, loneliness, was measured using the Three-item Loneliness Scale which has been modelled on the Revised University of California, Los Angeles Loneliness Scale. The questions ask respondents how often they felt they lack companionship, felt left out, and felt isolated from others. Respondents answered on a 5-point scale: never (scored as 0), rarely (1), occasionally (2), fairly often (3), or always (4). The total scores thus range from 0 to 12, with higher scores indicating a greater extent of loneliness. Loneliness was used as a continuous variable in the analysis.

Methods

We use cross-lagged panel models with fixed effects to assess the effect of loneliness on social networks over time. This approach allows us to estimate robust results that account for three possible sources of bias (i) loneliness and social networks can be associated cross-sectionally, (ii) auto-regressive relationships: loneliness at time t can influence loneliness at time $t+1$ and social networks at time t can influence social networks at time $t+1$, (iii) reverse causation: weak or strong social networks at time t can influence loneliness at time $t+1$. Causal inference is permitted since within-person fixed effects help account for the previously known status of respondents in the analysis.

In the analysis, we also account for time-varying factors – age, living arrangements, housing type as a proxy for household socioeconomic status, number health-related limitations in activity of daily living (ADL), number of health-related limitations in instrumental ADLs, number of chronic physical ailments, and depressive symptomatology (measured using the Center for Epidemiologic Studies – Depression Scale) and time-invariant factors – sex, ethnicity, and educational attainment.

Results

Our analysis suggest evidence for greater social engagement following loneliness. Specifically, the size of social networks (number of contacts) increases initially. Subsequently, a negative effect on the strength of networks (frequency of contact with close network members). We also find that family-focused social networks do not change at all in response to loneliness. Importantly, our results show a positive effect of loneliness on social networks followed by a contraction. This suggests that adaptation or coping strategies in response to loneliness become harder over time, and over time, loneliness can become maladaptive as seen in the decline in the strength of networks and friends-focused networks.

Table 1: Unstandardized Coefficients from cross-lagged panel models showing person-fixed effects of loneliness on social networks, 2009-2015

	Time t2 (2011)				
	Overall	Strength	Size	Family-focused	Friend-focused
Loneliness time t1 (2009)	0.352* (0.049, 0.655)	0.151 (-0.010, 0.313)	0.206* (0.028, 0.383)	0.087 (-0.103, 0.277)	0.255** (0.072, 0.438)
	Time t3 (2015)				
	Overall	Strength	Size	Family-focused	Friend-focused
Loneliness time t2 (2011)	-0.353 (-0.707, 0.001)	-0.259** (-0.448, -0.071)	-0.087 (-0.294, 0.119)	-0.167 (-0.389, 0.054)	-0.255* (-0.468, -0.041)
Observations	4612	4612	4612	4612	4612
AIC	265537.35	254093.26	255877.99	257042.48	256954.26
BIC	267303.37	255863.27	257648.00	258812.49	258724.28