A Friend in Need? Exploring the Influence of Life-Threatening Disease and Disability Onset on Close Friendships among Older Adults

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Abstract

Objectives: This research examines whether onset of life-threatening disease (i.e., cancer, lung disease, heart disease, or stroke) or Activities of Daily Living (ADL) disability influences the reported number of close friends.

Methods: Using data from the Health and Retirement Study (HRS) (2006-2012), this research capitalizes on panel data to assess changes in friendship over a four-year period. To evaluate changes to friendship, lagged dependent variable (LDV) and change score (CS) approaches were employed.

Results: Both the LDV and CS models provide evidence that onset of life-threatening disease was associated with reporting more friends four years later. In particular, onset of cancer was associated with reporting more close friends.

Discussion: This research provides evidence of the network activation hypothesis following onset of life-threatening disease among older adults.

Introduction

Friendship is a valuable source of social support across the life course including into old age (Barker, 2002; Ertel, Glymour, & Berkman, 2009; Thomas, 2016). Among older adults, having more friends is associated with better health and successful aging (Ashida & Heaney, 2008; Béland et al., 2005; Seeman & Berkman, 1988; White et al., 2009). Friends, compared with family members, appear to have a stronger and more positive influence on health behavior (Huxhold, Miche, & Schüz, 2013; Seeman, 2000) and health outcomes (Fiori, Antonucci, & Cortina, 2006). To illustrate, Fiori and colleagues (2006) examined social network typologies among older adults; compared with family-only social networks, friend-only social networks were associated with fewer depressive symptoms. It appears that a lack of friends is particularly detrimental to older adults' mental health and wellbeing.

Relative to midlife adults, older adults' social networks are smaller (Cornwell, Laumann, & Schumm, 2008; Smith et al., 2014). These smaller social networks are often characterized by decreases in the number of friends (Ertel, Glymour, & Berkman, 2009). Worsening health may be one explanation for smaller social networks in later life (Van Tilburg, Groenou, & Broese, 2002). Onset of chronic disease and disability may limit an older adults' ability to maintain social relationships—particularly friendships (Van Tilburg, Groenou, & Broese, 2002). Bury (1982) describes the onset of chronic illness as a "biographical disruption," where mutual exchanges of support are interrupted and social outings (due to social and physical barriers) become more cumbersome.

Older adults with chronic illness may reprioritize their social relationships in favor of family and "familiar territory" (Bury, 1992, p. 176). Yet, there is evidence that onset of chronic disease is associated with increases in social network size (Bloom & Kessler, 1994). Social

networks may become activated during a time of health crisis (Gage, 2013; Perry & Pescosolido, 2015), which may lead to increases in the number of reported friends. It is still an open question whether the onset of chronic illness or disability influences the number of close friends among older adults. Thus, the objective of this research is to examine whether health crises (i.e., onset of life-threatening chronic disease and self-care disability) among late midlife and older adults are associated with fewer friends.

Shrinking Social Networks: Socioemotional Selectivity Theory

Social networks shrink with increasing ages including friend-specific networks (Wrzus et al., 2013). Normative life events such as marriage or the birth of children are thought to contribute to these declines in social networks (Wrzus et al., 2013). Socioemotional selectivity theory (Carstensen, 1992), defined as the "lifelong selection processes by which people strategically and adaptively cultivate their social networks (p. 331)," is thought to explain reductions in network size over time. Carstensen (1992) argues that older adults' smaller social networks reflect a gradual process, where older adults have curated close bonds. Health crises, which alter perceptions about the future, may contribute to the larger trend of fewer friends and smaller social networks among older adults.

There is evidence that health crises in the form of life-threatening disease (e.g., cancer) are associated with smaller social networks and fewer friends in midlife (Courtens et al., 1996; Kroenke et al., 2006). To illustrate, in line with socioemotional selectivity theory, newly diagnosed women with ovarian cancer were found to reprioritize their social relationships in favor of immediate family and their closest friends—leading to a smaller social network with fewer unsupportive members (Norton et al., 2005). However, much of this research focuses on midlife women with cancer diagnoses.

Expanding Social Networks: Health Crises and Network Activation

There is evidence that onset of certain conditions are associated with activation of social networks or increases in network size (Bloom & Kessler, 1994; Perry & Pescosolido, 2015). For example, Bloom and Kessler (1994) documented an increase in network size following onset of cancer among mid- and late-life women. Disease and disability may be less stigmatized with advancing ages (Hill-Joseph, 2018; Pound, Gompertz, & Ebrahim, 1998)—leading to fewer negative changes in social network size. For example, Phenninx and colleagues (1999) examined social network size among older adults with chronic disease; social network size (both family and friends) did not vary by disease status. The number of friends were similar for older adults with and without life-threatening disease. However, this research was limited by cross-sectional data.

Although scant, there is evidence to suggest that older adults may have stable or even increases in social network sizes following a health crisis. This research purposefully focuses on only one aspect of older adults' social network: friends. Friends are crucial for maintaining good health in later life, yet friendships are often viewed as weaker ties that are more vulnerable during a health crisis. This research capitalizes on longitudinal data to assess changes in friendships following the onset of a life-threatening disease (i.e., cancer, lung disease, heart disease, or stroke) or self-care disability. Not only does this research examine the role of health crises in later life, but also explores whether the type of health crisis matters for friendship characteristics.

Methods

Data

The data for this project come from the Health and Retirement Study (HRS) Waves 8-12 (2006-2012). The HRS is nationally representative of Americans over the age of 50 living in the contiguous states (HRS, 2018). Respondents and their spouses (regardless of age) are interviewed every two years. This research draws on three data sources from the HRS: (1) HRS Core; (2) Psychosocial and Lifestyle Questionnaire (PLQ); (3) and the RAND Center for the Study of Aging's user-friendly, harmonized datafiles. The HRS Core files include information asked of all respondents and spouses, while the PLQ is a self-administered questionnaire with detailed social network/social support information collected from half-samples of core respondents/spouses every four years (for more information see Smith et al., 2016). The most recent version of the RAND HRS data (Version P) was used to maximize the longitudinal nature of the data (for more information see Bugliari et al., 2016).

Research Design

Three waves of data were used to establish the temporal order between onset of disease or disability and changes in number of close friends. Because the PLQ is only asked of half-samples (i.e., subsample A and subsample B), two different baselines (i.e., 2006 and 2008) were used so that both subsamples could be used in the analyses. Selection into the risk group at baseline (Time 1) was based on age-eligibility (i.e., 50+ years) and disease/disability status. Older adults free of life-threatening disease diagnoses and ADL disability at baseline were entered into the risk group and then followed for four years (or two waves).

Measures

Because follow-up of PLQ respondents only occurs every other wave (i.e., four years), number of friends was measured at baseline (Time 1) and four years later at Time 3 (for illustration of data structure see Supplemental Figure 1). The number of friends reported at both time points were highly right-skewed; therefore, extreme values were top coded at 11, which represented 95th percentile of values. For the change score models, a difference score was created by subtracting the number of friends in Time 3 from the number of friends in Time 1.

Onset of life-threatening disease (i.e., cancer, lung disease, heart disease or stroke) was measured at Time 2 and Time 3. These diseases were chosen because they represent the top four causes of death among older adults within the U.S. (Xu et al., 2016). A global measure of "any" onset was created, where a respondent developing at least one of the four diseases=1. A separate measure was created for each disease, where disease onset=1. Activities of Daily Living (ADL) disability was measured using five common ADL tasks: (1) difficulty walking across the room; (2) difficulty eating; (3) difficulty dressing; (4) difficulty bathing; (5) difficulty getting in/out of bed. If a respondent reported having difficulty with at least one of the five tasks over the four-year period, then they were classified as having developed ADL (or self-care) disability.

Numerous controls were used in the analyses to further isolate the effect of disease and disability on friendship characteristics. Baseline sociodemographic measures included age (10-year brackets), sex (female=1), race/ethnicity (White, Black/African American, Hispanic/Latinx, or other race), education (less than high school, high school, or more than high school), income quartiles, marital/partner status, and the number of living children. Baseline and Time 2 health measures included self-rated health (5=excellent health), number of (non-life-threatening) conditions, number of depressive symptoms, smoking status (current smoker=1), and obesity

status (body mass index>35=1). Because the analyses were pooled using the two different PLQ subsamples, a baseline wave measure was created. If respondents were part of subsample A (i.e., 2006), then "Baseline 2006"=1.

Analytic Strategy

Two approaches (i.e., lagged dependent variable (LDV) and change score (CS)) were used to assess changes in friendship over the four-year period. According to Johnson (2005), both approaches "can be used to control for the initial level of Y and exogenous variables but do so in different ways that can have substantial implications for the results" (p. 1063). Although Johnson (2005) argues that a CS approach is more advantageous, both approaches were used as an additional robustness check. The dependent variables for the LDV and CS approaches met conventional guidelines for normality; therefore, ordinary least squares (OLS) regression was estimated using either Time 3 measures for LDV or difference score for CS. However, to adjust for complex survey design and clustering at the household level, PLQ-specific weights and robust standard errors were used. Analyses and data management were conducted using SAS 9.4. To examine how specific types of health crises shape friendships, three models were created to examine: (1) onset of any life-threatening disease; (2) onset of specific diseases; and (3) onset of self-care disability.

Results

Table 1 presents the sample characteristics. The mean number of close friends in Time 1 was four. Seventeen percent of the sample experienced onset of a life-threatening disease, with heart disease as the most common type of disease onset. Nine percent of the sample experienced onset of ADL disability. On average, the change score demonstrated a relatively stable amount of friends over the four years.

Table 2 presents the regression coefficient estimates for number of friends and difference in friends from the LDV and CS approaches. In the LDV models (left-panel), Time 1 number of friends was associated with the number of friends in Time 3. In Model 1, onset of any life-threatening diseases was associated with an increase in the number of friends in Time 3. In Model 2, onset of cancer was associated with more friends. In the CS models (right-panel), onset of any life-threatening disease was associated with more friends. In Model 2, cancer was associated with an increase in the number of friends over the four-year period. Disability onset was not associated with changes in number of friends in either model. Sensitivity analyses were completed to ensure the robustness of these findings (see Online Supplemental Material for more details).

Discussion

This research suggests the influence of health crises on friendships in older ages vary by disease. The number of close friends was relatively stable across the four-year period; however, onset of life-threatening disease increased the number of reported friends—suggesting network activation. In particular, cancer onset was associated with more friends. This echoes Bloom and Kessler's (1994) findings related to cancer diagnoses among mid- and late-life women. It may be that some high profile diseases such as cancer lead to a rallying of social network members, yet other diseases may garner a smaller or opposite response. It is possible that cancer is viewed as a larger threat and deserving of more support. More research is needed to understand how disease onset influences the social networks of older adults.

There are important limitations worth noting. For example, only respondents who were currently free of disease and disability, with valid data at all three time points, were entered into the analyses. The research design is well suited for ensuring temporal precedence, but also leads

to selection bias based on health characteristics and high rates of attrition. It is plausible that this research underestimates the influence of health crises on friendships because the most seriously ill were lost to follow-up. Onset of disease/disability were based on self-reports over a short period of observation and do not capture variation in illness experiences.

Despite limitations, this research underscores that friendships remain a valuable source of support into later life. Because older adults tend to have smaller social networks, there appears to be an assumption that friendships will inevitably dwindle over time. Yet, this research documents support for network activation during a health crisis. With an increasing emphasis on caregiving convoys, the type of disease onset may have large implications for individuals and the people providing care during their illness. It is important to understand how health crises shape the illness experiences of older adults. Friends may be an overlooked resource for providing care to older adults among researchers and policymakers.

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Table 1. Sample characteristics (N=4,397)

	Mean	SD	Range
Number of Close Friends (t1)	4.05	3.00	0-11
Sociodemographic Characteristics (t1):			
Age Brackets			
50-59 years (ref.)	0.29		0-1
60-69 years	0.39		0-1
70-79 years	0.25		0-1
80+ years	0.06		0-1
Sex (female=1)	0.63		0-1
Race/Ethnicity			
White (ref.)	0.80		0-1
Black/African American	0.11		0-1
Hispanic/Latinx	0.07		0-1
Other race	0.02		0-1
Education			
Less than High School	0.11		0-1
High School (ref.)	0.55		0-1
More than High School	0.34		0-1
Income Quartiles			
Bottom (ref.)	0.22		0-1
Bottom-Middle	0.25		0-1
Upper-Middle	0.27		0-1
Upper	0.27		0-1
Married/Partnered	0.73		0-1
Number of Living Children	3.04	2.07	0-16
Baseline Health Measures (t1):			
Self-rated health (5=excellent)	3.69	0.93	1-5
Number of conditions	1.22	0.98	0-5
Number of depressive symptoms	0.92	1.59	0-8
Current smoker	0.11		0-1
Obese (BMI > 35)	0.09		0-1
Intervening Health Measures (t2)			
Self-rated health (5=excellent)	3.59	0.94	1-5
Number of conditions	1.43	1.06	0-6
Number of depressive symptoms	0.89	1.51	0-8
Current smoker	0.09		0-1
Obese (BMI > 35)	0.09		0-1
Onset of Life-Threatening Disease or Disability (t2 or t3):			
Onset of Life-Threatening Disease (any)	0.17		0-1
Onset of cancer diagnosis	0.05		0-1
Onset of lung disease	0.03		0-1
Onset of heart disease	0.08		0-1
Onset of stroke	0.02		0-1
Onset of ADL disability	0.09		0-1
Number of Close Friends (t3)	4.05	2.97	0-11
Difference in Number of Close Friends (t3-t1)	-0.00	2.87	-11-11
Baseline (t1) 2006	0.54		0-1

Notes: Weighted using PLQ 2006 and 2008 weights.

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Supplemental Table 1. Unstandardized linear regression coefficients (and standard errors) of number of close friends using Lagged Dependent Variable (LDV) and Change Score (CS) approaches

	Lagged Dependent Variable (LDV)			**Change Score (CS) t3-t1**		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Number of Close Friends (t1)	0.52***	0.52***	0.52***			
	(0.02)	(0.02)	(0.02)			
Sociodemographic Characteristics (t1):						
Age Brackets						
60-69 years	0.15	0.15	0.16	-0.08	-0.07	-0.06
	(0.10)	(0.09)	(0.10)	(0.11)	(0.11)	(0.11)
70-79 years	0.41***	0.42***	0.43***	0.04	0.05	0.06
	(0.12)	(0.12)	(0.12)	(0.13)	(0.13)	(0.13)
80+ years	0.15	0.17	0.17	-0.33	-0.30	-0.39
	(0.21)	(0.21)	(0.21)	(0.23)	(0.23)	(0.23)
Sex (female=1)	-0.02	-0.02	-0.03	-0.02	-0.02	-0.03
	(0.09)	(0.09)	(0.09)	(0.10)	(0.10)	(0.10)
Race/Ethnicity						
Black/African American	0.22	0.21	0.20	0.38*	0.37*	0.36*
	(0.15)	(0.15)	(0.15)	(0.17)	(0.17)	(0.17)
Hispanic/Latinx	-0.06	-0.07	-0.08	0.06	0.05	0.04
	(0.16)	(0.16)	(0.16)	(0.18)	(0.18)	(0.18)
Other race	-0.69*	-0.71*	-0.71*	-0.68*	-0.70*	-0.71*
	(0.30)	(0.30)	(0.30)	(0.31)	(0.31)	(0.32)
Education						
Less than High School	0.19	0.19	0.19	0.09	0.10	0.09
	(0.14)	(0.15)	(0.15)	(0.16)	(0.17)	(0.17)
More than High School	0.05	0.05	0.04	-0.07	-0.07	-0.07
	(0.09)	(0.09)	(0.09)	(0.11)	(0.11)	(0.11)
Income Quartiles						
Bottom-Middle	-0.07	-0.08	-0.08	-0.02	-0.03	-0.03
	(0.12)	(0.12)	(0.12)	(0.14)	(0.14)	(0.14)
Upper-Middle	-0.04	-0.04	-0.04	0.09	0.08	0.09
	(0.12)	(0.12)	(0.12)	(0.14)	(0.14)	(0.14)

Upper	0.14	0.13	0.13	0.28	0.26	0.27
	(0.13)	(0.13)	(0.13)	(0.16)	(0.16)	(0.16)
Married/Partnered	-0.01	-0.01	-0.01	-0.02	-0.01	-0.02
	(0.10)	(0.10)	(0.10)	(0.11)	(0.11)	(0.11)
Number of Living Children	-0.00	-0.00	-0.00	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Baseline (t1) 2006	-0.04	-0.04	-0.04	-0.01	-0.01	-0.01
	(0.08)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)
Baseline Health Measures (t1):						
Self-rated health (5=excellent)	-0.05	-0.05	-0.04	-0.12	-0.12	-0.12
	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)	(0.07)
Number of conditions	0.12	0.10	0.05	0.14	0.12	0.04
	(0.09)	(0.09)	(0.05)	(0.11)	(0.11)	(0.10)
Number of depressive symptoms	-0.04	-0.04	-0.04	0.01	0.01	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Current smoker	0.18	0.16	0.18	0.08	0.06	0.10
	(0.24)	(0.24)	(0.24)	(0.29)	(0.29)	(0.29)
Obese (BMI > 35)	-0.11	-0.10	-0.11	-0.17	-0.16	-0.16
	(0.20)	(0.20)	(0.20)	(0.23)	(0.23)	(0.23)
Intervening Health Measures (t2)						
Self-rated health (5=excellent)	0.08	0.08	0.08	0.02	0.02	0.00
	(0.06)	(0.06)	(0.08)	(0.07)	(0.07)	(0.07)
Number of conditions	-0.16	-0.13	-0.08	-0.18	-0.15	-0.07
	(0.09)	(0.09)	(0.08)	(0.11)	(0.11)	(0.10)
Number of depressive symptoms	0.00	-0.00	-0.00	0.00	0.00	0.01
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Current smoker	-0.39	-0.37	-0.39	-0.25	-0.23	-0.26
	(0.25)	(0.25)	(0.25)	(0.30)	(0.30)	(0.30)
Obese (BMI > 35)	0.19	0.20	0.19	0.24	0.25	0.25
	(0.21)	(0.21)	(0.21)	(0.24)	(0.24)	(0.24)
Onset of Life-Threatening Disease or Disability (t2/t3):						
Onset of life-threatening disease (any)	0.25*			0.36**		
	(0.12)			(0.14)		
Onset of cancer diagnosis		0.38*			0.49**	
		(0.16)			(0.18)	

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Onset of lung disease		0.33			0.44	
		(0.25)			(0.25)	
Onset of heart disease		-0.07			0.01	
		(0.17)			(0.18)	
Onset of stroke		0.17			0.10	
		(0.27)			(0.30)	
Onset of Activities of Daily Living (ADL) disability			0.05			-0.08
			(0.16)			(0.18)
Intercept	1.71***	1.72***	1.74***	0.32	0.34	0.41
R^2	0.30	0.30	0.30	0.01	0.01	0.01
N			4,397			
Number of Clusters			3,738			

Notes: *<0.05; **<0.01; ***<0.001; Weighted using PLQ 2006 and 2008 weights.

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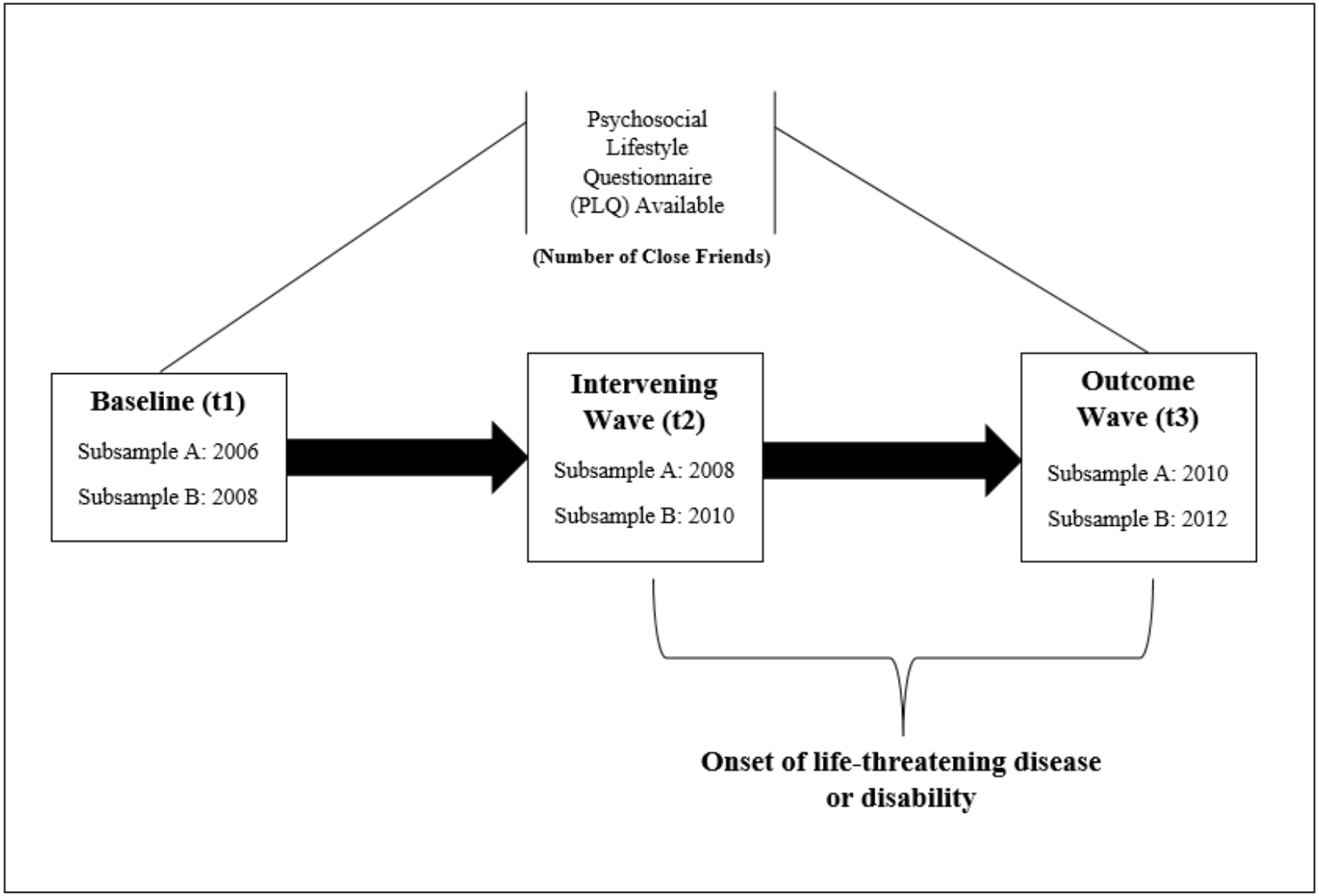

Supplement Figure 1. Illustration of data structure

Sensitivity Analyses

Several sensitivity analyses were conducted. The number of close friends reported was highly right-skewed. Extreme values were top coded at 11 close friends representing the 95th percentile. However, as an additional robustness check, a top code value of 15 (i.e., 98th percentile) was used and similar substantive findings were generated. To better isolate the effect of onset of life-threatening disease and disability on number of close friends, health measures were assessed at baseline and in the intervening wave (i.e., Time 2). Additional sensitivity analyses included a measure of Time 3 health measures—substantive findings were identical. Because life-threatening diseases often are accompanied by self-care disability, disability was entered into the disease models. The addition of disability as a covariate did not alter the results for "any onset" or specific diseases. Finally, a measure of positive and negative perceived support from friends was entered into the models with analogous results.