

Social network type and subjective well being in a national sample of older Americans

Howard Litwin, DSW

Professor, Paul Baerwald School of Social Work & Social Welfare
Head, Israel Gerontological Data Center, <http://igdc.huji.ac.il>
The Hebrew University in Jerusalem
Mount Scopus, Jerusalem 91905-IL, Israel
Tel: (972) 2 588 2194; Fax: (972) 2 582 3587

Sharon Shiovitz-Ezra, PhD

Lecturer, Paul Baerwald School of Social Work & Social Welfare
The Hebrew University in Jerusalem
Mount Scopus, Jerusalem 91905-IL, Israel

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ABSTRACT

Purpose of the study: The study considers the social networks of older Americans, a population for whom there have been few studies of network type. It also examines associations between network types and well being indicators: loneliness, anxiety and happiness.

Design & Methods: A sub-sample of persons aged 65 and older from the first wave of the National Social Life, Health and Aging Project was employed (N=1,462). We applied K-means cluster analysis to derive network types using seven criterion variables. In the multivariate stage, the well being outcomes were regressed on the network type construct and on background and health characteristics by means of logistic regression.

Results: Five network types were derived: "diverse," "friend," "congregant," "family" and "restricted." Network type was found to be associated with each of the well being indicators after adjusting for demographic and health confounders. Respondents embedded in network types characterized by greater social capital tended to exhibit better well being in terms of less loneliness, less anxiety and greater happiness.

Implications: Knowledge about differing network types should make gerontological practitioners more aware of the varying interpersonal milieus in which older people function. Adopting network type assessment as an integral part of intake procedures and tracing network shifts over time can serve as a basis for risk-assessment as well as a means for determining the efficacy of interventions.

Key words: network type, National Social Life, Health and Aging Project (NSHAP), older Americans, loneliness, anxiety, happiness

INTRODUCTION

Social network type is an important indicator of social capital — “the array of social contacts that give access to social, emotional and practical support” (Gray, 2009:6). Network type is a composite characterization of the interpersonal milieu in which people are embedded. The measurement of network type and the analysis of its role in promoting well being among older adults should be of concern to gerontologists, and particularly to practitioners who serve the older population. However, there is still only limited attention paid to the notion of social network type in the gerontological literature.

Studies of Social Network Type

Groundbreaking social network studies in England and Wales initially derived five social network types (Wenger, 1991) that effectively identified community-dwelling older people at-risk (Wenger, 1997) and later served as diagnostic criteria for gerontological social work practice (Wenger & Tucker, 2002). Subsequent analysis of survey data on older adults residing in the community in Israel derived five slightly different social network groupings—termed diverse, friend-focused, neighbor-focused, family-focused and restricted (Litwin, 2001). The respective network types mainly reflected variations in social network composition. It was found, moreover, that the networks with a wider range of social ties, such as the diverse and friend-focused network types, had the best outcomes. In comparison, the social network grouping with the most limited ties—the restricted network—revealed the poorest mental health, the least physical activity, and the greatest 7-year mortality (Litwin, 2003; Litwin & Shiovitz-Ezra, 2006).

Efforts to replicate the Israeli typology in an American sample have been recently reported. Analysis of data from the Americans' Changing Lives study derived diverse, family, friends and restricted social network types, with some variation—that is, two types of restricted networks

were discerned (Fiori, Antonucci, & Cortina, 2006). As noted, restricted network types are those with the most limited extent of social ties. In the American study, depressive symptomatology was highest for individuals embedded in non-friends restricted networks and lowest for those who maintained diverse networks.

Similar analyses of data from a study of older people in the United States and Japan derived mostly similar network types (Fiori, Antonucci, & Akiyama, 2008). However, while the network types were associated with well being in the American sample in the study, they were not related in the Japanese sample. In a recent Korean study of older adults, a simpler social network typology was identified and an association between network type and well being was discerned. Those in diverse networks reported the best health and those in isolated networks, reported the worst (Cheon, 2010).

Analysis of data from the Australian Longitudinal Study of Aging found that social networks rich in friends were protective against 10-year mortality among 70 year olds (Giles, Glonek, Luszcz, & Andrews, 2005). However, the ALSA study considered characteristics of network composition rather than composite social network types per se. An analysis of data from the Berlin Aging Study derived six multidimensional network types, taking into account network structure, function and quality. The investigators found a relationship between the resultant network types and depressive symptoms, subjective well being and morbidity (Fiori, Smith, & Antonucci, 2007).

Well Being

The construct of well being reflects a rather large collection of positive states that range from objective functional health to subjective perceptions of life quality (George, 2010). Subjective well being refers to a positive orientation toward life and is generally based upon such

feelings as happiness, morale, positive affect and life satisfaction. Research has shown that these various measures are mostly inter-related and that they frequently constitute a single dimension (Slocum-Gori, Zumbo, Michalos, & Diener, 2009).

The indicators of subjective well being in late life are associated with several background factors. Meta analyses show that age, income and education are positively related to subjective well being, while female gender is negatively related (Pinquart & Sorensen, 2000, 2001). Blacks (Yang, 2008) and Hispanics (Barger, Donoho, & Wayment, 2009) score lower than Whites on various subjective well being measures. Health has emerged as the primary correlate, but the principal health measure—self-rated health—may confound with the subjective well being outcome (Pinquart & Sorensen, 2000).

The current analysis focuses upon three selected indicators of subjective well being: loneliness, anxiety and happiness. Loneliness is a discrete, subjective construct that reflects the perceived discrepancy between desired and achieved social relationships (Peplau & Perlman, 1982). In the United States, some 17% of people aged 50 and above report loneliness (Theeke, 2010). Studies of older people show that loneliness is negatively associated with emotional well being (Lee & Ishii-Kuntz, 1987), a predictor of cognitive decline (Wilson, et al., 2007) and a risk factor for depressive symptoms (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006). Furthermore, loneliness poses substantial mortality risk, even after controlling for demographic and clinical characteristics (Shiovitz-Ezra & Ayalon, 2010).

Although anxiety is highly comorbid with depression, it reflects a distinct indicator of poor mental health. Moreover, anxiety is associated with medical illness, cognitive decline, disability, sleep disturbance and hospitalization, all matters of concern to older people (Brenes, et al., 2009; Kvaal & Laake, 2003; Wolitzky-Taylor, Castriotta, Lenze, Stanley, & Craske, 2010). Happiness

is a common outcome measure employed in studies of subjective well being (Baker, Cahalin, Gerst, & Burr, 2005; McAuley, et al., 2000; Menec, 2003; Theurer & Wister, 2010). Surveys indicate that the vast majority of American adults are happy (George, 2010). Moreover, older adults, particularly men, tend to report higher levels of happiness (Yang, 2008), while health impairment is an inverse predictor of happiness among centenarians (Bishop, Martin, & Poon, 2006).

Social Network, Loneliness, Anxiety and Happiness

There is little reported research on the association between social network types among older adults and loneliness, anxiety or happiness. However, analyses based upon data from the Framingham Heart Study seem to suggest that loneliness and happiness may both be products of one's social network. It was found that people tended to cluster by the traits and states of members (happiness or loneliness, respectively) within three degrees of their network. Moreover, happy networks seemed to make their members happier and lonely networks further isolated lonely people (Cacioppo, Fowler, & Christakis, 2009; Fowler & Christakis, 2008).

A study in Dublin examined the Wenger social network typology in relation to anxiety and depression among very old persons (Golden, et al., 2009). The analysis considered the effects of loneliness and network type separately. It found that loneliness accounted for most of the depressed mood, but that network type was an independent predictor as well, albeit to a lesser degree. A follow-up study of very old people in the Kungsholmen District of Stockholm, in Sweden, found that anxiety among those with no previous psychiatric disorder was associated with having an insufficient network, that is, no children and no regular visitors (Forsell, 2000).

Research Questions

Based upon the preceding review, the study reported here addresses three major questions. Firstly, can a robust typology of social network types indeed be discerned among older Americans? Secondly, are social network types among older Americans unique to this population, or do they reflect the kinds of social networks that are found in other settings? Thirdly, does the social network type in which one is embedded really matter, that is to say, is there a significant association between network type and well being among older Americans?

DESIGN AND METHODS

The analysis is based upon data from the first wave of the National Social Life, Health and Aging Project (NSHAP), a survey that examines health and interpersonal connections among community-dwelling older Americans. Generated using the field operation employed for the 2004 wave of the Health and Retirement Study (HRS), the NSHAP sample is representative of the population of non-institutionalized Americans aged 57–85. Data collection was executed in 2005-6, yielding 3,005 respondents. African-Americans, Latinos, men, and the older age group were over-sampled in order to provide adequate representation of these subgroups (O’Muircheartaigh, Eckman & Smith, 2009).

The main NSHAP instrument was a two-hour in-home computer-assisted personal interview (CAPI) conducted in English or Spanish with a weighted response rate of 75.5%. Data collection included a brief self-administrated post-interview questionnaire, the response rate for which was about 84 percent (Smith et al., 2009). The current analysis focused on respondents aged 65 and older within the NSHAP sample, and included only those who completed both the CAPI interview and the self-administrated questionnaire. The resultant analytic sample was N=1,462.

Given that we addressed a selected part of the sample only and sought primarily to derive social network types and to clarify the relationships between selected variables, we did not employ the weights that are available for the entire NSHAP sample.

Study Variables

As in previous analyses, “network type” was derived through the application of K-means cluster analysis to the following social capital variables relevant to older adults: current marital status; number of children; number of close relatives, number of friends; frequency of getting together with neighbors; frequency of attendance at religious services; and frequency of attendance at organized group meetings (Gray, 2009; Litwin, 2001). These particular variables reflect the main components of the social networks of older people as they are reported in the social support literature (Berkman & Syme, 1979; Lubben, et al., 2006; Wenger, 1991).

Current marital status was measured as a dichotomy: (1= married or living with a partner; 0=other). Number of children was a simple count (0–6) in which the final category reflected six or more children. Number of close relatives and number of friends were both measured on a six-point scale, as it was solicited in the original NSHAP questionnaire (0=none; 1=1; 2=2-3; 3=4-9; 4=10-20; and 5=more than 20). Frequency of getting together with neighbors was tapped on a 5-point scale ranging from hardly ever (1) to daily or almost daily (5). Frequency of attendance at religious services and at organized group meetings were also measured on 5-point scales ranging from never (0) to weekly or more (4). The frequency ratings for attendance at religious services and organized group meetings were asked in relation to the previous 12 months, while the frequency of neighbor contact was queried in general.

The dependent variable in the analysis was well being, as measured on three separate constructs: loneliness, anxiety and happiness. The loneliness measure was the specific item in the

CES-D Depression scale that asks how often the respondent felt lonely in the previous week. We collapsed the 4-point answer scale into a dichotomous response (0=rarely or never felt lonely; 1=felt lonely sometimes or more often).

Anxiety was tapped by a modified version of the seven-item anxiety subscale of the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). Respondents report on feelings of anxious mood, thoughts and restlessness over the past week, with higher values indicating higher anxiety levels. The modified anxiety measure achieved satisfactory concurrent validity and significant correlations with other quality of life indicators in NSHAP (Shiovitz-Ezra, et al., 2009). The total score for the anxiety subscale ranges from 0-21. The suggested cutoff point for the presence of possible anxiety is between 7 and 8 (Herrmann, 1997). We employed this cutoff to create a dichotomous anxiety measure.

Happiness was measured by a single probe: "If you were to consider your life in general these days, how happy or unhappy would you say you are on the whole...extremely happy, very happy, pretty happy, unhappy sometimes, or unhappy usually?" This question was adopted by NSHAP in light of its equivalence to an item from the General Social Survey, which established concurrent validity, and its use in several different studies (Kousha & Mohseni, 2000; Maselko & Kubzansky, 2006). It was dichotomized here to distinguish between very happy or more (1) and pretty happy or less (0).

Correlates included sociodemographic background and health. The background variables—age (65-74; 75-85), gender (men/women), education (less than high school, high school, some college, bachelor's degree or more), ethnicity (white, black, Hispanic and others) and subjective income—were gathered through self-report. In the case of subjective income, the subjects were asked "compared with American families in general, would you say that your household income

is far below average, below average, average, above average or far above average." Subjective income has been found elsewhere to constitute a robust reflection of economic status (Litwin & Sapir, 2009).

Health was measured in terms of respondents' functional capacity, as reflected in the difficulty experienced with six basic activities of daily living (ADL): walking across a room, dressing, bathing, eating, getting in or out of bed, and using the toilet. Measured on a four-point ordinal scale ranging from no difficulty to unable to do so, we dichotomized the functional health indicator to reflect no ADL difficulty and one or more such difficulties.

Analysis

In order to test the association between social network type and well being, bivariate and multivariate analyses were executed. Cross-tabulations were carried out between network type and the three dichotomous well being outcomes. Bivariate associations were also examined between the correlates and the outcome measures, and between the correlates and the network type construct. The chi-square statistic was consulted in each case. In the multivariate stage of the analysis, the well being outcomes were regressed on the collection of study variables by means of logistic regression. Odds ratios were computed to show the relative likelihood that people with a given characteristic felt lonely, anxious or happy. The reference categories for each variable in the analysis are indicated in the appropriate table.

RESULTS

Table 1 presents the characteristics of the social network types that were identified through the clustering process. The results of post hoc group comparisons that were performed on each of the delineating characteristics, using the Tukey HSD test, are also shown in the table. The

numbers that appear in bold italics constitute the subsets with the highest values while the numbers that are underlined constitute the subsets with the lowest values.

As may be seen in the table, five network types were derived. The "diverse network" in the NSHAP sample demonstrated the greatest degree of sociability, on the whole. Its members had the greatest percentage of married members as well as the greatest number of children and close family members, the highest degree of neighbor get-togethers and the most frequent attendance at religious services. Respondents in this network type also exhibited a considerable number of friends and fairly frequent attendance at organized group meetings.

<<<<<<< Table 1 about here >>>>>>>>

Respondents clustered in the grouping termed "friend network" reported the greatest number of friends and the most frequent attendance at organized group meetings, as well as relatively frequent attendance at religious services. The social strengths of the friend network, therefore, were in the extra-familial ties maintained by its members. In comparison, those included in the "congregant network" type also had frequent attendance at religious services, but were indistinguishable on most of the other clustering criteria. They also showed the lowest rate of attendance at organized group meetings. It can be assumed for these reasons that the people in the congregant network engaged in social exchange primarily with other congregants at their place of worship.

The next grouping, labeled "family network," was characterized by its relatively high number of children, on average, and by the relative dearth of other kinds of ties in the entourage, especially extra-familial ties. It seems that respondents in the family network type could count mainly on their children. Finally, the members of the "restricted network" cluster in the NSHAP sample reported the lowest scores on four of the seven criterion variables. Moreover, the

remaining three criteria, on which they showed only mid-range rankings, were all extra-familial in nature. Respondents in the restricted network type had the least social capital and were most at-risk in terms of sociability.

The frequency distributions of the social network types show that almost one fifth of the sample was embedded in a diverse network (Table 2). Friend networks accounted for more than a quarter. About a sixth was in congregant networks and a bit less in family networks. More than a fifth of sample respondents belonged to restricted networks. As for the well being outcomes, about a third of all respondents felt lonely in the previous week, some 13 percent felt anxious and a bit more than half were very happy in general.

<<<<<<< Table 2 about here >>>>>>>

At the bivariate level, social network type was found to be related to all three well being outcome measures. The vast majority of background and health variables were also related to loneliness, anxiety and happiness. For example, lower education was related to greater loneliness, greater anxiety and less happiness. Additional bivariate analyses (not shown) revealed that the respondents' background and health characteristics were also related to the network types: age ($\chi^2=14.9$, $p<.01$), gender ($\chi^2=28.5$, $p<.001$), ethnic group ($\chi^2=74.5$, $p<.001$), education ($\chi^2=81.4$, $p<.001$), income ($\chi^2=46.6$, $p<.001$), and health ($\chi^2=32.2$, $p<.01$). Thus, for example, more high income respondents belonged to friend networks than to other network types, and those in the family network had worse functional health than respondents in the other networks. The bivariate analyses substantiated the need to control for the background and health characteristics in examination of the association between social network type and well being.

Table 3 presents the multivariate regressions in which each of the dichotomous well being outcomes was regressed on the network, background and health variables. Looking first at the

background and health characteristics, the following associations were observed. Female respondents felt lonelier than men, had greater anxiety and were less happy. The same was true for respondents with one or more functional health disabilities when compared to those with no disability. Other findings showed that those with less education were lonelier than persons with college degrees and those with lower income were less happy than persons in the high income reference category. Finally, the young-old reported being happier than the old-old (but not feeling lonelier or more anxious). Blacks and Hispanics expressed a greater degree of anxiety when compared to Whites.

After controlling for respondents' background and health characteristics the construct of network type maintained an independent association with each of the outcome measures. Thus, when compared to the reference category (restricted network), respondents in the diverse network were less likely to have felt lonely and less likely to have felt anxious. Moreover, a positive association with happiness had borderline significance ($p=.067$). Respondents who belonged to the friend network were less likely to feel anxious and more likely to feel happy. However, their scores on the loneliness outcome measure were not different than those of respondents in the reference category. Members of the congregant network were also found to be happier, and people in the family network were less anxious than those in the restricted network comparison group.

<<<<<<< Table 3 about here >>>>>>>

DISCUSSION

Using a methodology that was applied in previous research on a non-American sample (Litwin, 2001), the current analysis identified five discernable network groupings among respondents in the National Social Life, Health and Aging Project (NSHAP). These groupings

were appreciably different in terms of seven different aspects of social capital. The resultant network constellations that were derived in this procedure were termed "diverse," "friend," "congregant," "family" and "restricted" network types. Although the groupings varied somewhat in their relative distribution within the sample, each social network type was nevertheless representative of a meaningful proportion of the study population, reflecting the different interpersonal milieus in which older Americans are embedded.

The analysis also revealed that four of the five network types derived from the NSHAP data reflect the main social network types that have been identified in previous studies (Fiori, et al., 2006; Litwin, 2001). These include the diverse, friend, family and restricted networks. However, a fifth network grouping also emerged, one that is unique to the current study sample. Its exceptional characteristic was its high relative frequency of attendance at religious services as well as its minimal attendance at organized group meetings of other kinds. We termed this grouping the congregant network, insofar as its outstanding feature was its social exchange with other people at a place of worship.

It seems that the social networks of older Americans in the NSHAP sample are mostly similar to the main types that have been identified earlier. This suggests that the network type construct can indeed be used as an assessment measure for characterizing the nature of the social worlds in which older adults live and function. At the same time, the study also points to a new social aggregate which seems to draw support from its religious social connections. This network grouping accounts for about a sixth of the sample respondents, suggesting that faith-based social networks may have particular importance for certain segments of the current older American population. Future inquiry on the antecedents and the concomitants of belonging to a congregant network type is indeed warranted.

The present study also considered whether there is an association between social network type and subjective well being among older Americans. The findings confirm that networks with a wider range of social ties are indeed related to better well being, independent of the effects of demographic and health confounders. Respondents embedded in diverse, friend and congregant network types expressed a superior sense of subjective well being as reflected, to varying degrees, in their levels of loneliness, anxiety and/or happiness. It is important, therefore, to recognize the potential effect of different social network types on the subjective well being of their members.

A few limitations of the current analysis should be cited. The distributions of the network types as reported here reflect their relative proportion in the unweighted sample, as specific weights for the 65+ cohort were not available. For more precise specification of network type distribution in the older American population, therefore, additional analysis would be required. Nevertheless, the current distribution still provides useful initial parameters for consideration of social network types and their concomitants.

A second limitation is that the analysis was based upon available measures in the data base. This is a constraint that is inherent in all secondary analysis. However, this obstacle was only a minor limitation, insofar as the NSHAP data provided a wealth of relevant indicators. Finally, we note that the current analysis is based upon a single wave of cross-sectional data. Thus, we cannot yet determine whether it is the social network type that affects older persons' subjective well being or whether it is the nature of lonely, anxious and/or happy people that tends to lead them to cluster, a priori, in different social network types. Further research on this question is certainly warranted

Given the instructive findings from this research, a supplementary question to be considered concerns how the notion of social network type can aid in the work of gerontological practitioners. There are four practical implications in this regard. First, the awareness of existing network types may help sensitize gerontological practitioners to the varied interpersonal environments in which older adults are embedded. This may result in improved critical consideration of how social networks function to enhance or restrain the well being of their members. Second, efforts should be made to create practitioner-friendly instruments that can “type” clients’ social networks in a cost-effective and an efficient manner. Additional empirical work that tests the parameters of network type criterion variables and formulates appropriate algorithms for network typing is recommended. Attention should also be given as to how to involve older clients in the assessment of their social networks.

Third, the social network type construct can serve as a basis for risk-assessment as well as a means for determining the efficacy of interventions. For example, the documented movement of a person from a diverse network to a restricted network could be a warning signal that he or she is at increased risk. Conversely, one's transition from a family network to a congregant network could indicate that networking interventions carried out on his or her behalf were indeed successful. These applications imply that periodic assessments of older adults’ social network types are warranted. Fourth, service agency practitioners should think further about how the notion of social network type might enhance their own professional practice, leading to the development of additional relevant field-driven applications of this construct.

In sum, the construct of social network type has much potential for gerontological research and practice. Future inquiry should address additional aspects of the interpersonal milieu that can be included in the derivation and identification of different network types. Research can clarify,

for example, whether social network types derived by the present methodology are as effective, in terms of assessment, as more structurally driven social network inventories, such as those that employ name generating mechanisms. Further inquiry in this respect is likely to provide additional useful benefit, and should be encouraged.

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Table 1: Network delineation criteria and social network type distribution among older Americans: Cluster analysis

Values of criterion variables^a

Network type	Married ^b		Number of Children ^b		Number of close relatives ^b		Number of friends ^b		Get together with neighbors ^b		Attend religious services ^b		Attend organized group meetings ^b	
	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>	<u>Mean^c</u>
Diverse	0.67	5.14	3.52	3.76	2.64	3.73	2.43	3.56	0.58	0.74	1.21	1.29	2.56	1.92
Friend	0.57	2.17	2.93	3.79	2.58	3.60	2.48	2.15	2.29	2.44	3.30	2.92	2.44	1.92
Congregant	0.58	2.16	2.98	3.20	2.48	3.60	2.48	2.15	2.29	2.44	3.30	2.92	2.44	1.92
Family	0.61	4.55	2.80	<u>2.30</u>	<u>2.15</u>	1.21	<u>0.74</u>	1.21	<u>0.50</u>	2.56	3.30	2.92	2.44	1.92
Restricted	<u>0.55</u>	<u>1.61</u>	<u>2.43</u>	3.05	2.29	<u>0.50</u>	1.29	<u>0.50</u>	2.56	3.30	2.92	2.44	1.92	1.92
Total	0.59	2.96	2.92	3.30	2.44	3.30	2.92	2.44	1.92	3.30	2.92	2.44	1.92	1.92

a. Variable scale ranges: married (0-1); number of children (0-6); number of close relatives (0-5); number of friends (0-5); get together with neighbors (1-5); attend religious services (0-4); attend organized group meetings (0-4).

b. Analysis of variance: married (F=2.55, p<.04); number of children (F=685.10, p<.00); number of close relatives (F=46.14, p<.00); number of friends (F=71.33, p<.00); get together with neighbors (F=6.66, p<.00); attend religious services (F=1,009.05, p<.00); attend organized group meetings (F=423.99, p<.00).

c. Post hoc group comparisons—Tukey HSD test: numbers that appear in bold italics (e.g. **0.67**) constitute subsets with the highest values; numbers that appear underlined (e.g. 0.55) constitute subsets with the lowest values.

Table 2: The well-being of older Americans by social network type and background characteristics: Frequencies^a and cross-tabulation (chi-square)

Variables	categories	Frequencies		LONELY		ANXIOUS		HAPPY	
		N	%	%	χ^2	%	χ^2	%	χ^2
Network	Diverse	276	18.9	28.3	9.9*	9.6	13.4*	56.9	17.5**
	Friend	398	27.2	27.9		9.4		61.8	
	Congregant	239	16.3	31.9		13.2		55.9	
	Family	220	15.0	39.1		14.6		51.5	
	Restricted	329	22.5	32.8		17.3		47.1	
Background									
Age	65-74	824	56.4	29.0	4.9*	11.2	3.3+	58.7	10.4**
	75-85	638	43.6	34.5		14.4		50.2	
Gender	Men	682	46.6	24.7	27.0***	9.9	8.4**	61.1	19.1***
	Women	780	53.4	37.3		15.0		49.7	
Ethnic group	White	1102	75.6	29.3	9.6*	11.1	10.8*	53.8	2.9
	Black	195	13.4	36.4		16.8		58.5	
	Hispanic	131	9.0	40.5		19.5		59.5	
	Other	29	2.0	34.5		10.7		58.6	
Education	Less than high school	333	22.8	43.8	48.8***	18.0	20.1***	48.5	12.3**
	High school	409	28.0	32.1		13.1		54.3	
	Vocational/ some college	434	29.7	30.2		12.5		55.8	
	BA or more	286	19.6	17.8		6.0		62.5	
Income	Far below average	166	11.7	45.8	42.5***	16.7	19.9**	42.2	38.7***
	Below average	364	25.7	36.4		17.0		50.4	
	Average	596	42.0	30.4		12.0		54.6	
	Above average	244	17.2	18.0		5.8		68.4	
	Far above average	49	3.5	22.4		8.3		73.5	
Health	No ADL difficulty	1045	71.6	28.3	16.3***	9.6	30.2***	59.0	22.9***
	One+ ADL	414	28.4	39.1		20.3		45.2	
Total		1462 ^a	100.0	32.0		12.6		55.4	

+ .05 > p < .10, * p < .05, ** p < .01, *** p < .001

a. Due to missing data, category totals vary: ethnic group – n=1457; income – n=1419; health – n=1459; all other variables – n=1462.

Table 3: Background characteristics, social network type and well-being among persons aged 65+ in the NSHAP sample: Logistic regression

Variables	Categories ^b	LONELY ^a (N=1410)		ANXIOUS ^a (N=1390)		HAPPY ^a (N=1410)	
		OR	95% CI	OR	95% CI	OR	95% CI
Network	Diverse	0.69*	0.47 1.00	0.42**	0.25 0.71	1.38+	0.98 1.95
	Friend	0.81	0.58 1.14	0.49**	0.31 0.79	1.82***	1.32 2.49
	Congregant	0.77	0.53 1.14	0.54*	0.32 0.92	1.70***	1.19 2.44
	Family	1.09	0.75 1.60	0.59*	0.36 0.98	1.25	0.86 1.80
Age	75-85	1.16	0.91 1.47	1.24	0.89 1.73	0.77*	0.61 0.96
Gender	Women	1.74***	1.36 2.23	1.49*	1.05 2.11	0.65***	0.52 0.82
	Black	1.21	0.85 1.72	1.69*	1.06 2.70	1.37+	0.97 1.94
Ethnic group	Hispanic	1.29	0.84 1.99	1.94*	1.11 3.39	1.29	0.85 1.97
	Other	1.54	0.68 3.50	1.15	0.33 4.02	1.39	0.61 3.15
Education	Less than high school	2.07**	1.34 3.19	1.94+	0.99 3.78	0.89	0.60 1.31
	High school	1.51*	1.01 2.26	1.87+	1.00 3.52	1.09	0.77 1.54
Income	Vocational or some college	1.51*	1.03 2.24	1.88*	1.01 3.49	1.08	0.77 1.50
	Far below average	1.47	0.67 3.24	1.09	0.33 3.57	0.36**	0.17 0.76
Below average	Below average	1.25	0.59 2.65	1.50	0.48 4.67	0.45*	0.23 0.91
	Average	1.08	0.52 2.23	1.08	0.35 3.31	0.48*	0.25 0.96
Above average	Above average	0.69	0.32 1.49	0.64	0.19 2.13	0.85	0.42 1.73
	One or more ADL difficulty	1.31*	1.02 1.70	2.09***	1.49 2.93	0.65**	0.51 0.83

+ .05 > p < .10, * p < .05, ** p < .01, *** p < .001

a. Outcome variables: Loneliness – 0=rarely felt lonely, 1= felt lonely sometimes or more; Anxiety – 0= score of 0-7 on HADSA scale, 1=score of 8-21; Happiness – 0=pretty happy or less, 1=very happy or more.

b. Reference categories: age – 65-74; gender – male; ethnic group – white; education – Bachelor degree or more; income – far above average; health – no ADL difficulty; network – restricted network type; loneliness – (0); anxiety – (0); happiness – (0).