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Nonkin in Older Adults' Personal Networks: More Important Among Later Cohorts?

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Objectives. Research on age-related changes in personal networks has found compelling evidence for socioemotional selectivity theory and exchange theory holding that older adults experience a decline in less emotionally close nonkin relations as they age. However, recent societal developments are likely to have increased the salience of nonkin relations. We hypothesize that age-related decline in the proportion of nonkin in personal networks has been delayed or is slower in late birth cohorts of older adults compared with earlier cohorts.

Method. Seven observations by the Longitudinal Aging Study Amsterdam covering a time span of 17 years since 1992 were analyzed using multilevel regression analysis. The sample had 12,949 person-year observations from 3,516 respondents born between 1908 and 1937.

Results. Age-related decline in the proportion of nonkin is absent for cohorts born after 1922 and large for cohorts born in 1922 and before. Mediating variables for health and other resources did not explain cohort differences in age-related change.

Discussion. The salience of nonkin relationships is likely to have increased due to societal changes, resulting in absence or delay of decline in later cohorts. The findings raise the need for a reevaluation of old age and the creation of new theoretical perspectives.

Key Words: Cohort differences—Nonkin relationships—Personal networks—Social change.

In this study, we examine how social changes have affected the personal network composition of older adults as they move through old age by studying age-related changes in the proportion of nonkin in the personal networks of older adults born between 1908 and 1937. The loss in variety in personal network ties among the oldest adults can be considered important because the oldest old are most likely to be in need of access to a large number of potential supporters due to declining health (Newsom & Schulz, 1996). In addition, older adults with restricted or strongly kin-centered personal networks are at a disadvantage across a range of health measures compared with those with diverse or friendship-centered networks (Fiori, Antonucci, & Cortina, 2006; Keller-Cohen, Fiori, Toler, & Bybee, 2006).

Nonkin relationships have become more salient in contemporary society (Allan, 2008; Pahl & Pevalin, 2005). Previous studies on age-related change show that nonkin ties in the personal network are less common among oldest adults (Shaw, Krause, Liang, & Bennett, 2007; Van Tilburg, 1998). Recent societal changes beg the question of whether this pattern of age-related loss in variety in personal network ties pertains to later cohorts of older adults.

Importance of Nonkin Relationships

Kin and nonkin relationships provide different structures and functions for individuals. Kin relationships are generally more stable across the life course and more strongly motivated by normative expectations for contact, affection, and assistance (Finch & Mason, 1990). Close kin ties provide the majority of social support to older adults and there is a strong association between the quality of the support given and received in these relationships and health (Antonucci, 1985). Nonkin relationships tend to be a voluntary choice, guided by feelings of affection and sympathy. In addition, nonkin ties give more access to nonredundant information and resources (Granovetter, 1973). As a result of their voluntary nature and diverse resources, nonkin ties are desired by older adults in order to maintain feelings of autonomy when they are faced with the prospect of becoming dependent on others (Silverstein, Chen, & Heller, 1996). Greater variety in network composition is associated with less distress (Haines & Hurlbert, 1992).

Age-Related Changes in the Proportion of Nonkin in Personal Networks

Two theories explicate mechanisms behind age-related changes in network composition, that is, socioemotional selectivity theory and exchange theory. The basic principle of socioemotional selectivity theory holds that adults intentionally reduce the number of peripheral and nonintimate ties as they age (Carstensen, 1992). During the life span, emotional regulation becomes increasingly more significant than information seeking. This theory has received much support over the past years. Lang and

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Carstensen (2002) showed that older adults give priority to emotional regulatory goals over knowledge-related goals in the case of limited time perspective, resulting in more relatives and fewer friends and other (novel) nonkin relations in the personal network. Exchange theory focuses on the balance between support that is given and received in relationships. With aging and deteriorating health, one is less likely to give support and more likely to receive it (Morgan, Schuster, & Butler, 1991). If the balance is upset, relationships are likely to end (Gouldner, 1960). This pertains in particular to older adult's peripheral relationships where intimacy is low and norms regarding providing support in unbalanced relationships are weak, such as with acquaintances (Klein Ikkink & Van Tilburg, 1999).

Cohort-Related Changes in Nonkin Relationships

An important, largely unexplored subject concerns how and to what extent recent societal and health changes affect opportunities for different birth cohorts of older adults to maintain nonkin relations. The life-course perspective stresses an interplay between human lives and historical times (Elder, 1994). Particularly in rapidly changing societies, older adults from different birth cohorts are likely to have been exposed to different historical worlds. In general, social and cultural contexts have undergone considerable changes that are likely to have implications for older adults' personal network composition. Allan (2008) described transformations in relationships in Western societies since the 1970s. He argued that social life has become less rooted as individuals commitments to social organizations that have always fostered stability, for instance, ties to local communities and a certain employer, have disappeared in favor of less durable and more conditional involvement. In addition, individuality and individual self-fulfillment are promoted as core cultural values (Agahi & Parker, 2005). These developments are likely to have resulted in different choices when constructing personal networks. Due to these changes, social identities are likely to have become more flexible. Within this context, more discretionary relationships like those with nonkin that can serve to reinforce social identity are particularly likely to increase in salience over cohorts. Moreover, the Internet and other information technology stimulate individuals to maintain contact with acquaintances at a distance (Wang & Wellman, 2010). This is particularly the case for older adults who face health decline. Based on the earlier discussions, we hypothesize that age-related decline in the proportion of nonkin relationships in personal networks of older adults has changed, that is, the onset of decline has delayed and/or the decline has slowed (hypothesis 1).

Previous studies give some indication about cohort changes in nonkin relationships. Ajrouch, Akiyama, and Antonucci (2007) observed that older adults from cohorts born between 1913 and 1932 have higher levels of social contact than those born between 1933 and 1951. A study based on data we will also analyze showed that salience of friendship in older adulthood increased across subsequent birth cohorts (Stevens & Van Tilburg, 2011). Pohjolainen (1991) showed an absence of differences in contact with friends across four cohorts born between 1905 and 1921. Although seemingly at odds with our hypothesis, this finding fits with theory that social change became marked only in the 1970s, when these cohorts passed age 50.

Acknowledging different experiences of aging that take place either gradually or rapidly due to historical and social changes (Dannefer, 1988; Elder, 1994), we propose three possible models that can help us identify parameters of change of cohort differences in age-related changes in proportion of nonkin relationships. First, we assume that cohorts may enter old age with different levels of nonkin in their networks, resulting from socially induced differences in the life course. Such "baseline-level" differences may persist as people age. Second, socioemotional selectivity and exchange theory assume a focus on close kin as one ages, either due to a shift to emotional regulation or due to less opportunities to maintain reciprocal relationships. This shift may be postponed to a later phase in the life course for younger cohorts, resulting in a "delayed" decline of the proportion of nonkin relationships. This model can be linked to capacities, as a delayed decline in functional capacity and cognitive functioning until a later age for younger cohorts could delay the onset of age-related decline in different domains of functioning. Third, older adults from different birth cohorts may experience different patterns of loss, stability, and gains in personal relationships as they age. In this "slowing" model, age-related decline has slowed significantly for later birth cohorts. The core reasoning for this model is that social change has altered the process of aging, resulting in differential developments in functioning for various birth cohorts. Current social structures may provide more opportunities to transform latent resources into manifest social relationships. The main purpose of these models is that they allow us to differentiate between three types of cohort-related changes in age-related decline in nonkin relationships that point at different processes.

Explaining Cohort-Related Changes in Nonkin

When we observe cohort differences in the proportion of nonkin in personal networks, the next question is which specific societal developments are related to the increasing proportion of nonkin relationships in networks. The influences of societal changes on the personal network composition of older adults depend on their individual characteristics.

Older adults who have better functional capacity, self-rated health, and cognitive functioning are more likely to have social networks that are either diverse or friend

based (Béland, Zunzenegui, Alvarado, Otero, & Del Ser, 2005; Mendes de Leon, Gold, Glass, Kaplan, & George, 2001). Health problems, like a poor functional capacity and cognitive functioning, have been associated with lower degrees of social integration in networks (Cornwell, 2009; Schaefer, Kornienko, & Fox, 2011; Schafer, 2012). Concerning changes in chronic illness, the "compression of morbidity" hypothesis holds that later cohorts of older adults will experience prolonged life expectancy and later onset of morbidity in their life span due to a postponed onset of chronic illness (Fries, 1980). As a consequence, one of the premises of socioemotional selectivity—that people shift from informational to emotional needs when they perceive having limited time left—could hold less for later cohorts until they reach an advanced age. In addition, better functional capacity, self-rated health, and cognitive functioning could result in more resources to maintain reciprocal relationships. Even when older adults from later cohorts consider mortality, they could perceive this as something far off in the future. For the Dutch cohorts under study, both life expectancy and healthy life expectancy remained relatively stable (Statistics Netherlands, 2011a, 2011b). Although this makes it unlikely that health problems would provide an explanation for cohort differences in age-related decline in the proportion of nonkin in personal networks, health problems could still cause a decline in nonkin relationships for individual older adults.

Education is assumed to be an indicator of human capital that gives more cognitive resources and skills necessary to sustain and develop personal relationships (Broese van Groenou & Van Tilburg, 2003). Higher education is linked to larger network size, containing a higher proportion of nonkin and higher involvement in social organizations (Ajrouch, Blandon, & Antonucci, 2005; Shaw, Krause, Liang, & Bennett, 2007). Employment in midlife is likely to result in having more nonkin relationships later in life as employment provides opportunities to develop and continue contacts with coworkers (Cozijnsen, Stevens, & Van Tilburg, 2010). Those in higher level occupations have more opportunities to develop ties with coworkers and are more geographically mobile, resulting in larger, more diverse, and less proximate personal networks (Ajrouch, Blandon, & Antonucci, 2005). Both educational level and occupational level have increased substantially across cohorts in the Netherlands, as have female employment rates (Liefbroer & Dykstra, 2000), making it likely for these developments to contribute to an explanation of the trend toward a larger proportion of nonkin in the personal networks of older adults. In addition, individuals living in urban areas have a smaller proportion of close kin and a larger proportion of friends in their social networks (Fischer, 1982). There is no evidence on cohort changes in living in urban areas among older adults. Later cohorts have a higher involvement in voluntary associations, leading to more opportunities to foster and maintain nonkin ties (Donnelly & Hinterlong, 2010; Li, 2007).

Decline in religious attendance could be another factor explaining cohort differences in age-related change in nonkin relationships. In the Netherlands, the proportion of individuals aged 60 or older who attend church at least every 2 weeks has decreased from just above 70% in 1965 to approximately 55% in 2005 (Becker & De Hart, 2006). Evidence of how church attendance affects personal network composition is equivocal. On the one hand, church attendance fosters social integration and the development of nonkin ties by offering an environment in which many people share values and activities (Bradley, 1995; Ellison & George, 1994). On the other hand, religion emphasizes traditional views concerning the importance of marriage and kin relations and maintaining social closure within the religious group, thereby possibly discouraging having many nonkin relations. We would also expect a larger travel distance to the nearest child to result in more nonkin relationships in the personal network because structural opportunities for contact and social support exchange with children will decline if they live further away and are possibly replaced by nonkin ties (Connidis & Davies, 1990). There is however limited data on cohort differences in travel distance between Dutch older parents and children; Van der Pas, Van Tilburg, and Knipscheer (2007) reported no changes. Compared with retirement, being employed should also result in more nonkin network ties due to higher exposure to coworkers (Van Tilburg, 2003). The loss of these relationships due to retirement however is smaller in later cohorts (Cozijnsen, Stevens, & Van Tilburg, 2010).

In sum, we expect a higher proportion of nonkin in later cohorts than in earlier cohorts of older adults, due to higher functional capacity, fewer chronic diseases, better self-rated health, better cognitive functioning, higher educational level, increased occupational level, more frequent employment at age 40, increased urbanization, lower frequency of church attendance, and higher rates of volunteering and employment (hypothesis 2).

The Present Research

We study networks of Dutch people born between 1908 and 1937. Compared with previous studies, this study has three main advantages. First, we employ data from seven longitudinal observations. Such data on a number of birth cohorts is scarce but necessary to distinguish between age and cohort effects in personal networks (Cornwell, Laumann, & Schumm, 2008). Second, in contrast to former studies on cohort differences focusing on one type of relationship, like friends (Stevens & Van Tilburg, 2011), we consider the entire range of the personal network. This allows us to interpret cohort-related changes in the network's proportion of nonkin in light of changes in other parts of the personal network. Third, we study cohort changes in different domains of functioning, that is, social and health, that have been associated with a supposed shift toward increasing salience of nonkin relationships.

Method

Respondents

Data were derived from the Longitudinal Aging Study Amsterdam (LASA), an ongoing longitudinal, multidisciplinary research project focused on physical, cognitive, social, and emotional functioning of the aging population (Huisman et al., 2011). This program employed a stratified random sample of men and women born between 1908 and 1937. The oldest participants, particularly the men, were overrepresented in the sample. The sample was taken from population registers of 11 municipalities, varying in religion and urbanization. The LASA sample was initially recruited for the Living Arrangements and Social Networks of Older Adults (LSN) research program (Knipscheer, De Jong Gierveld, Van Tilburg, & Dykstra, 1995). Of the 6,107 eligible individuals in the LSN sample, 2,302 (38%) were unwilling to participate due to lack of interest or time; another 734 had died or were too ill or cognitively impaired to be interviewed. A total of 3,107 LSN sample respondents took part in the first LASA observation (1992–1993). Follow-ups were conducted in 1995–1996 (N = 2,545), 1998–1999 (N = 2,076), 2001–2002 (N = 1,691), 2005–2006 (N = 1,257), and 2008–2009 (N = 835).

Data were collected by means of computer-assisted personal interviews. For each follow-up, on average 81% of the respondents were reinterviewed, 12% had died, 2% were too ill or too cognitively impaired to be interviewed, 4% refused to be reinterviewed, and less than 1% could not be contacted due to a residential relocation to another country or an unknown destination. We excluded 161 respondents who were institutionalized at baseline because their networks are incomparable with people living independently. We missed network data for 128 respondents due to their incapacity to undergo a full interview. Respondents with only one observation were included in our analyses, as our main focus lies on cohort differences in nonkin relations rather than exclusively on longitudinal developments. The exclusion of respondents with only one observation would bias the intercept, that is, the proportion of nonkin at the onset of our trajectories.

Data on networks were available for 89% (N = 3,516) of respondents across the observations. Reasons for missing data were premature termination of an interview or item nonresponse (1%), use of an abridged version of the questionnaire at a specific observation (4%), or a telephone interview for respondents who were too frail to be interviewed with the full questionnaire (6%). On average, 3.7 person-year observations were available for each respondent. The pooled data set included 12,949 person-year observations. The age of the 1,712 male and 1,804 female respondents varied between 54 and 98 years (M = 72.2, SD = 8.6) at the time of the observation. Respondents were followed for a maximum of 17.6 years (M = 6.9, SD = 6.5). From observation to observation, we had an increasingly selective sample composition. Respondents for whom no follow-up network data were available compared with respondents with follow-up network data were older (odds ratio [OR] = 1.07, Wald = 640.0, $p < .001$) and had a larger proportion of kin in their network in the previous observation (OR = 1.01, Wald = 57.3, $p < .001$). There was no gender difference (Wald = 4.1, $p > .01$).

Measures

Nonkin relationships within personal networks.—In each observation, a domain-specific approach for network delineation was employed that encompasses the following classification of personal relationships: household members, children and their partners, other family members, neighbors, contacts through work and school, members of associations, and other nonkin relationships. For each of the seven domains, the following question was asked: "Name the people you have frequent contact with and who are also important to you" (Van Tilburg, 1998). The criteria of importance were left to the interpretation of the respondent and only persons aged 18 and older could be considered. The identification method was similar across observations. The dependent variable in our analysis is the proportion of nonkin calculated as the number of nonkin ties portioned by the total network size.

Various independent, mediating, and control measures were included. *Time* was the time since baseline observation measured in days and computed in years. *Age in 1992* was the respondent's age at baseline and designates the various birth cohorts. We measured *functional capacities* with six questions about activities of daily living, based on Katz, Ford, Moskowitz, Jackson, and Jaffe (1963), such as "Can you walk up and down stairs?" The five possible answers were: 1 = *not at all*, 2 = *only with help*, 3 = *with a great deal of difficulty*, 4 = *with some difficulty*, and 5 = *without difficulty*. Reliability is .83 and we summed item scores to obtain a scale score ranging from 6 (*poor*) to 30 (*good*). *Number of chronic diseases* for seven major chronic conditions was counted from 0 to 7. We included *self-perceived health* (1 = *poor*, 5 = *very good*) and measured *cognitive functioning* using the Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975), with scores ranging from 0 to 30. Reliability is .72. Attained *educational level* was measured in nominal years that it takes to complete such a level (ranging from 5 = *elementary not completed* to 18 = *university education*). *Occupational level* consists of five categories ranging from 1 = *elementary*, 2 = *low*, 3 = *medium*, 4 = *high*, and 5 = *scientific occupational* level. Respondents were asked to precisely give their occupation at various life stages. The occupation(s) indicated by the respondents were coded according to the Standard Classification of Occupation (SBC92) from the Statistics Netherlands (CBS). The highest achieved occupation level during the life course was taken

as the value. In case of absence of information about the occupational level of the respondent, the occupational level of the partner was imputed. For the 216 respondents for which we lack their own and partner's occupational level, we assigned the mean value (2.8). Other measures were whether the respondent was *employed at midlife*, arbitrarily chosen at age 40 (0 = *no*, 1 = *yes*); *church attendance* (1 = *yearly or less*, 5 = *weekly or more*); *partner status* (0 = *no partner*, 1 = *has partner*); *travel distance in minutes to the nearest child* (range 0–1,440 min); and *parental status* (0 = *has children*, 1 = *childless*). As distance to nearest child was not available for those that do not have children, for these respondents, this variable was imputed with the mean score. Included were also whether the respondent does any *volunteering* (0 = *does not volunteer*, 1 = *does volunteering*) and is *employed* at the time of the interview (0 = *not employed*, 1 = *is employed*). Finally, we included the respondent's *network size* (range 0–75) and *gender* (0 = *male*, 1 = *female*) to control for whether the change in proportion of nonkin is valid across different network sizes and to control for the stratified nature of the sample in terms of gender composition.

Data Analysis

We employed a multilevel regression random effects model. All independent variables are entered as fixed effects, which are similar to regression parameters in ordinary regression analysis. A random effect at the respondent level is included to control for the dependency between person-year observations from the same individuals. The use of a mixed effects model had two advantages. First, it is capable of dealing with missing observations. Second, not taking into account, the dependency between person-year observations of the same individuals would result in biased standard errors (*SE*s; Snijders & Bosker, 1999). In order to avoid problems with multicollinearity, we centered all independent variables around the mean. In Model 1, we estimated age-related change in the proportion of nonkin. We included a linear and a quadratic time term, the latter to determine curvatures in age-related change. Gender and network size were included as control variables. In order to test whether age-related decline differs between birth cohorts of older adults (hypothesis 1), we fitted an interaction between age in 1992 (representing birth cohort) and time (linear and quadratic) to the data in Model 2. This analysis only signals cohort differences but does not allow us to discriminate among the baseline-level, delay, and slowing models. In a next step, we have therefore divided our sample into six 5-year birth cohorts and conducted parallel analyses in order to determine intracohort age-related change (Models 3a–f). Within five sets of two subsequent birth cohorts, where the age spans overlap considerably, we compared the intercept (estimated at the same age, i.e., the youngest age of the earlier cohort in the set) and the effects term of time (both the linear and quadratic time term). We tested coefficient equality for the five cohort comparisons by calculating the z statistic (Brame, Paternoster, Mazerolle, & Piquero, 1998). Because results of two analyses among the same cohort in a different set only differ with respect to the intercept, we present the parameters for one equation for each cohort. In order to test hypothesis 2 (mediation), we add our explanatory variables to the equation in Model 4 and determined whether the differences between birth cohorts in age-related change can be explained by our mediating variables.

Results

The descriptive statistics for six age cohorts at baseline are presented in Table 1. Older adults from later cohorts had a larger network size. Cohort differences with regard to gender were not found due to oversampling of older men in early cohorts. Functional capacity was higher and number of chronic diseases was lower in later cohorts. Self-perceived health and cognitive functioning were also better in later cohorts. Older adults from later cohorts had attained a higher level of education and were employed more often at age 40. No cohort differences with regard to occupational level were observed. Older adults from later cohorts have a lower frequency of church attendance and on average dwell in less urbanized areas. Older adults from later cohorts are more likely to have a partner. Travel distance to the nearest child does not differ between cohorts. Older adults from later cohorts are childless less often, more likely to volunteer, and be employed. Some of these differences are due to the different ages at which respondents were interviewed.

The results of regression Model 1 (Table 2) show an average of 35% nonkin in the network within the pooled sample. There is a linear age-related decline in the proportion of nonkin over time ($B = -.26$). The proportion of nonkin declines with an average of approximately 5% over the 17 years of observation. We also found a weak positive quadratic time effect ($B = .02$). Furthermore, respondents from later birth cohorts have a larger proportion of nonkin in their personal networks ($B = -.25$). Respondents who have a small network have a lower proportion of nonkin in their personal networks, whereas no differences were observed with regard to gender.

In line with hypothesis 1, age-related decline in the proportion of nonkin is smaller for later cohorts than for earlier cohorts, as indicated by the significant negative interaction term between age in 1992 and linear time (Model 2; $B = -.02$). We also estimated a model with an interaction of quadratic time and age at baseline, but the interaction effect was not significant (not displayed) and was therefore dropped from the model.

The results of the analyses conducted so far point toward cohort differences in the age-related changes in the proportion of nonkin. To discriminate between the

Table 1. Description of the Sample at Baseline (*N* Respondents = 3,516)

	Total sample	Age 54–59 in 1992 (*N* = 546)	Age 60–64 in 1992 (*N* = 573)	Age 65–69 in 1992 (*N* = 573)	Age 70–74 in 1992 (*N* = 551)	Age 75–79 in 1992 (*N* = 650)	Age 80–84 in 1992 (*N* = 623)	χ^2/F
Age in 1992 (54–84 years)	69.7	56.8	61.8	66.8	71.7	76.8	81.7	24034.4***
Female	51%	52%	54%	55%	51%	47%	50%	9.5
Network size	14.1	16.5	15.2	14.6	13.4	13.5	11.7	18.0***
Functional capacity (6–30)	28.0	28.8	28.8	28.4	27.9	27.5	26.5	42.0***
Chronic diseases (1–6)	1.0	.7	.8	1.0	1.1	1.2	1.2	37.3***
Self-perceived health (1–5)	3.7	3.8	3.8	3.7	3.7	3.5	3.6	9.2***
Cognitive functioning (MMSE, 6–30)	27.1	27.9	27.8	27.7	27.1	26.5	26.0	66.3***
Educational level attained (5–19 years)	8.7	9.4	9.3	8.7	8.5	8.3	8.3	13.3***
Employed at age 40	68%	76%	73%	65%	63%	70%	65%	34.7***
Occupational level (1–5)	2.8	2.8	2.8	2.7	2.7	2.8	2.8	2.1
Church attendance (1–5)	2.6	2.5	2.5	2.8	2.5	2.7	2.8	4.0***
Urbanization (1–5)	3.0	2.9	2.9	3.0	3.1	3.1	3.2	4.1***
Travel distance to child (in min)	23.9	26.4	18.7	21.3	21.0	24.3	30.7	1.8
Having partner	70%	85%	80%	75%	72%	61%	48%	55.6***
Childless	15%	14%	14%	12%	17%	14%	21%	4.8***
Volunteering	31%	43%	38%	34%	29%	24%	19%	113.5***
Employed	13%	47%	17%	7%	3%	3%	2%	788.1***
Number of observations	3.7	4.9	4.7	4.1	3.4	2.9	2.4	158.9***

Notes. MMSE = Mini-Mental State Examination.
***$p < .001$.

Table 2. Linear Multilevel Regression of Proportion Nonkin in Personal Networks (*N* Respondents = 3,516; *N* Observations = 12,949)

	Model 1	Model 2
	B	*B*
Fixed effects		
Constant	35.45***	35.12***
Time	−.26***	−.29***
Time^2	.02***	.02**
Age in 1992 (54–84 years)	−.25***	−.28***
Female	.33	.40
Network size	.53***	.53***
Age in 1992 × Time		−.02***
Random part respondent level		
Intercept	286.0***	287.4***
Slope	−4.1***	−4.0***
Intercept–slope covariance	.9***	.9***
Random part observation level		
Intercept	228.9***	228.9***
−2 Log likelihood	113,605	113,583
Model improvement		(χ^2 = 22, *df* = 1)

Notes. **$p < .01$; ***$p < .001$.

baseline-level, delay, and slowing models, we have studied age-related change for six different 5-year birth cohorts (Table 3, Models 3a–f). Based on the results of these six regression models, we illustrated the developments in the proportion of nonkin for the six birth cohorts in Figure 1. For all but the latest cohort (born in 1933–1937; Model 3a), the developments were linear. The results of *z* tests showed that the intercept and the parameters for time and for time squared did not differ significantly for four of five comparisons between two cohorts in subsequent pairs. A significant difference in time coefficients was observed between the 1923–1927 birth cohort (Model 3d; $B = -.07$; $SE = .10$) and the 1918–1922 cohort (Model 3c; $B = -.65$; $SE = .15$; $z = -3.3$; $p < .01$). This difference stands for a divide between cohorts born after 1922 (aged 69 or younger in 1992; Models 3a–c) where the slope of age-related decline is nonsignificant, and cohorts born before 1922 (Models 3d–f) where there is a significant linear decrease in the proportion of nonkin over time. For the two birth cohorts for which the time coefficient differed significantly, we calculated the proportion of nonkin relationships at age 73 and 83 (spanning the age period that they have in common). At the age of 73, adults born between 1918 and 1922 had an average of 36% nonkin in their personal networks, whereas for those born between 1923 and 1927, this was 35%. At the age of 83, the average percentage of nonkin for older adults born between 1918 and 1922 was 30% (a decrease of 6% since age 73), and 35% (no difference since age 73) for those born between 1923 and 1927. As the cohort difference in the percentage of nonkin at age 73 is not very large (intercepts did not differ) but grows between the ages of 73 and 83 with a stable proportion among the latest cohort, we conclude that there is a delay in the onset of age-related decline in this observation period for those two cohorts and not a difference in speed of decline.

Subsequently, by extending Model 2, we tested whether the mediating variables could explain differences observed between our cohorts (hypothesis 2). In Model 4 (Table 4), the interaction between age in 1992 and time showed that age-related decline differed significantly across birth cohorts ($B = -.02$; $SE = .01$). In our descriptive analyses (see Table 1), we observed that educational level, cognitive functioning, and volunteering have increased over the subsequent cohorts in our study, and frequency of church attendance has decreased. However, after including potential mediating variables in Model 4, the age in 1992 by time interaction effect does not differ compared with Model 2 ($B = -.02$, $SE = .01$). In other words, our mediating variables do not significantly explain differences in age-related change across birth cohorts. Older adults with better cognitive functioning, higher educational level, lower church attendance, no partner and no children, and who volunteer have a higher proportion of nonkin in their personal networks.

Discussion

In this study, we addressed whether age-related decline in the proportion of nonkin in the personal networks of older adults is consistent across birth cohorts of older adults born between 1908 and 1937. We found support for hypothesis 1, in which we expected that age-related decline would differ between birth cohorts of older adults as a result of societal changes, which—according to Allan (2008)—occurred since the 1970s. In our total sample, we found a first indication of differential age-related changes in the proportion of nonkin in the significant negative interaction between age at baseline and linear time, which showed that decline in nonkin relationships is weaker for later birth cohorts of older adults. In further analyses, we observed a rupture in the pattern of linear age-related decline between the 1918–1922 and 1923–1927 cohorts. Those born on or before 1922 had a linear decline in the proportion of nonkin relationships over time, whereas for cohorts born after 1922, no decline was observed. This might indicate that the onset of decline within later cohorts has been postponed to beyond the observation period—at the same speed as earlier cohorts or slower—but, alternatively, there might be no decline for younger cohorts at any age. It would be interesting to obtain information from an extended follow-up period on our younger cohorts of older adults as they move beyond middle age into older age in order to determine how age-related development will occur at higher ages. We can however conclude that developments are clearly different for these cohorts than for earlier cohorts.

We expected a delay or slowing of the decline in nonkin relationships across subsequent birth cohorts based on the different historical conditions to which these cohorts were

Table 3. Linear Multilevel Regression of Proportion of Nonkin in Personal Networks for Six 5-Year Birth Cohorts (*N* Respondents = 3,516; *N* Observations =12,949)

	Model 3a	Model 3b	Model 3c	Model 3d	Model 3e	Model 3f
	55–59 years in 1992 (*N* = 546)	60–64 years in 1992 (*N* = 573)	65–69 years in 1992 (*N* = 573)	70–74 years in 1992 (*N* = 551)	75–79 years in 1992 (*N* = 650)	80–84 years in 1992 (*N* = 623)
	B	*B*	*B*	*B*	*B*	*B*
Fixed effects						
Constant	38.94***	37.58***	35.16***	33.98***	33.56***	30.20***
Time	−.04	−.11	−.07	−.65***	−.45*	−.84**
Time^2	.03**	.01	.01	.01	.00	.06
Age in 1992	−.01	.22	−.17	.03	−.50	.24
Female	−.77	−2.01	1.04	.70	−.39	4.49*
Network size	.60***	.51***	.53***	.47***	.48***	.47***
Random part respondent level						
Intercept	247.8***	252.7***	323.2***	277.1***	275.7***	344.9***
Slope	−.5**	−5.4***	−3.7**	−8.6***	−3.7*	1.5
Intercept–slope covariance	.5***	.8***	1.0***	2.6***	1.1**	1.5
Random part observational level						
Intercept	225.5***	209.9***	201.1***	237.8***	248.6***	260.3***
−2 Log likelihood	23,136	23,102	20,595	16,580	16,631	13,415

Notes. In each of the subsequent models, age in 1992 is centered around the youngest age of the earlier cohort.
*$p < .05$; **$p < .01$; ***$p < .001$.

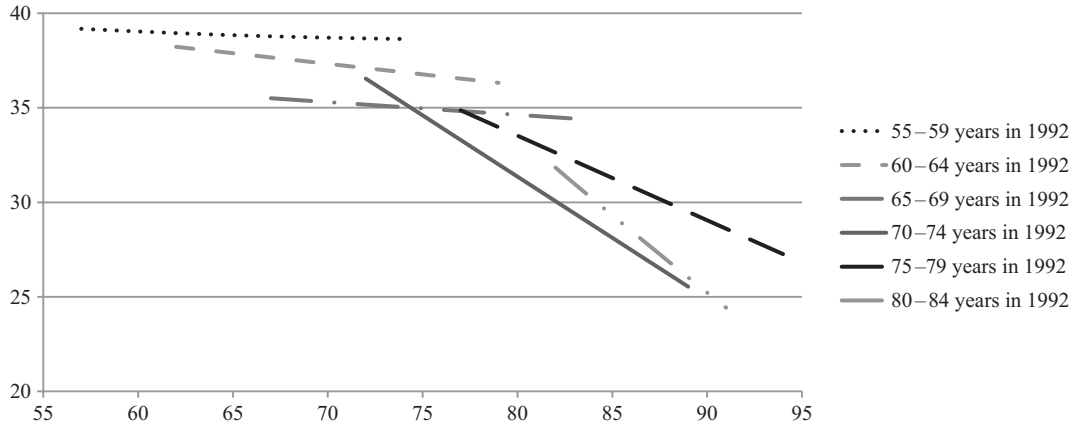

Figure 1. Percentage of nonkin relationships for six age cohorts over a time span of 17 years, controlled for gender and network size.

exposed. We found a clear cutoff point after which age-related decline in the proportion of nonkin relationships was absent. This sharp demarcation was not expected at the outset of the study. Processes of modernization can be depicted as long-term gradual trends but also can have abrupt manifestations. In the current study, we were not able to link the cohort differences in nonkin to specific turning points in history. In further research, emphasis on the causes of cohort differences in age-related change in nonkin relationships is of vital importance. In any case, earlier cohorts in our study seem to have been disadvantaged in terms of resources as well as societal circumstances.

Our findings raise the need for a reevaluation of old age and the creation of new theoretical perspectives. Most important, the absence of age-related decline in nonkin relationships at higher ages for the youngest cohorts in this study cast doubt on the degree to which socioemotional selectivity and exchange theory can explain age-related change in later cohorts. The maintenance of nonkin ties to a later age suggests that the ending of less close relationships is not a universal and unavoidable process, but its occurrence is concomitant to the social context as well as to resources of individual older adults. The results of Model 4 showed that a decline in cognitive functioning, but not in functional capacity, remains an obstacle to include nonkin ties in the network. The idea advocated in the application of exchange theory to older age that health is propelling change in network composition is thus only partially confirmed in this study. The findings that a higher educational level and better cognitive functioning contribute to the absence of age-related decline in later birth cohorts suggest that younger cohorts have more resources, which

Table 4. Linear Multilevel Regression of Proportion Nonkin in Personal Networks: Mediation Model

	Model 4
	B
Fixed effects	
Constant	35.24***
Time	−.30***
Time^2	.01*
Age in 1992	−.22***
Female	2.88***
Network size	.62***
Age in 1992 × Time	−.02***
Functional capacity (MMSE, 6–30)	−.01
Chronic diseases (1–7)	.33
Self-perceived health (1–5)	−.30
Cognitive functioning (6–30)	.30***
Educational level attained (5–18 years)	.89***
Employed at midlife	1.51
Occupational level (1–5)	1.19*
Church attendance (1–5)	−1.16***
Urbanization (1–5)	.25
Having partner	−2.88***
Travel distance to the nearest child (in min)	.01
Childless	21.18***
Volunteering	3.81*
Employed	1.59
Random part respondent level	
Intercept	198.2***
Slope	−4.0***
Intercept–slope covariance	.84***
Random part observation level	
Intercept	223.8***
−2 Log likelihood	112,423
Model improvement (compared with Model 2)	(χ^2 = 1,160; *df* = 14)

Notes. MMSE = Mini-Mental State Examination.
*p < .05; ***p < .001.

could make it more viable to maintain balance in relationships until a higher age than before. Also, the absence of an effect of being employed on the proportion of nonkin suggests that retirees do not necessarily have less opportunities to maintain ties with nonkin. Another explanation for the absence of an effect of job status could be that coworker ties are substituted by nonkin ties from other activities, like volunteering.

Until now, increases in the range of personal relationships included in the networks of older adults as well as social participation at more advanced ages have often been associated with the baby boomers who are now are starting to enter old age (Einolf, 2009). Explanations for these projections have pointed at increased educational level, better health, and the increased prevalence of living alone of the baby boom generational cohort compared with earlier cohorts. We already observed these trends in cohorts born before 1945. Although the results of the current study are likely to provide only a glimpse of possible changes in age-related development of personal networks of older adults in coming decades, based on our results, we would hypothesize for further study that the changes already observed in cohorts born just before World War II will persist in cohorts born after 1945.

Although the structures and functions of nonkin relationships are likely to have changed over time, we do know from studies that kin relationships have also undergone substantial changes. Trends in partnership and family structure that have arisen since the 1970s, encompassing among others a vast increase in divorce rates and stepfamilies as well as the rise of cohabitation and living-apart-together relationships, are indicative of the greater freedoms individuals have in their family life (Allan, 2008; Bumpass, Sweet, & Cherlin, 1991) These changes have made partner and kin relationships less durable and more subject to individual needs and preferences. As such, kin and nonkin have become more alike in terms of the degree of security, durability, and instrumental and emotional support provided within these relationships. From the viewpoint of socioemotional selectivity, changes in kin relationships may have affected the importance of nonkin. It might be that nonkin relationships have increased in emotional significance and that boundaries drawn between kin and nonkin will become increasingly permeable among cohorts as they age in coming decades. Future research should therefore study how support exchange of older adults has changed in both kin and nonkin relationships in recent decades.

In relation to hypothesis 2, we observed that our mediating variables did not explain the cohort differences in age-related change. Despite this, our results indicate that changes in social conditions are likely to provide a stronger explanation for the delay in the onset of age-related decline across birth cohorts than improvements in functional capacity, chronic illness, and self-rated health. We observed that a higher educational level, being employed in midlife, and a low frequency of church attendance were related to having more nonkin in the network, and levels of education, employment, and church attendance changed across subsequent birth cohorts. By contrast, we observed no effect for various health indicators (functional limitations, self-rated health, and chronic illness) on the proportion of nonkin relationships. Although these measures improved across cohorts in our sample, in line with the compression of morbidity hypothesis (Fries, 1980), this provided no explanation for a larger proportion of nonkin in the personal networks of older adults from later cohorts. The finding that cognitive functioning contributes to the maintenance of nonkin relationships resonates with other studies. Aartsen, Van Tilburg, Smits, and Knipscheer (2004) showed that a decline in cognitive functioning among older adults was related to a lower likelihood of having a large network with many different kin and nonkin ties over time. Also, it is possible that nonrandom attrition of respondents has affected our results slightly, as those that were older and had more nonkin in their networks were somewhat less likely to have multiple person-year observations.

Finally, we would like to draw attention to the generalizability of our findings to other Western countries. There is a growing acknowledgment that social structure affects and is influenced by network ties of individuals (Entwisle, Faust, Rindfuss, & Kaneda, 2007). In a study on cross-national differences in the social network structure of older adults in Japan and the United States, differences between these two countries could be traced back to cultural values as well as sociostructural characteristics (e.g., life expectancy and divorce; Fiori, Antonucci, & Akiyama, 2008). Although the current study is based on a Dutch sample of older adults, similar developments toward a weaker decline in nonkin relationships can be expected in the United States and other Western countries, as these countries share many cultural and sociostructural characteristics like an individualistic rather than collectivistic cultural orientation and similar demographic patterns (e.g., smaller families and increasing life expectancy). Despite a similarity in the direction of age-related developments, the actual breakpoint in age-related change in nonkin relationships observed in our study is unlikely to be applicable to other contexts, as the exact timing and intensity of social changes may differ across social contexts.

In sum, we have assessed cohort differences in personal network composition of older adults. We observed that cohorts of older adults born after 1922 do not have an age-related decline in nonkin relationships, in contrast to earlier cohorts. Clearly, social developments that have occurred over the last decades have considerably shaped the personal network composition with which older adults move through old age.

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