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Advances in Life Course Research

journal homepage: www.elsevier.com/locate/alcr

Longitudinal analyses of the effects of age, marriage, and parenthood on social contacts and support[☆]

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ARTICLE INFO

Article history:

Received 21 July 2011

Received in revised form 27 August 2012

Accepted 28 August 2012

Keywords:

Social contacts

Social networks

Marriage and family

Life course

Aging

ABSTRACT

Using large-scale panel data, this paper examines how social contacts change across the life course. Fixed-effects regression models are used to ascertain within-person changes over a 12-year period. The models show that marriage does not affect weaker ties whereas it does change the nature of the stronger ties that people have: friendships become less important and more. Parenthood entails a shift toward more local ties: there are negative effects on friendships and acquaintances but these are compensated by positive effects on neighbors. Divorce and widowhood have positive effects on contact and support, but the effects are more pronounced for widowhood, especially for women. Age effects suggest a decline in the size of most subnetworks combined with increased support from relatives but not from friends, neighbors, and acquaintances. The findings are discussed in light of a theoretical framework which distinguishes the roles of needs, opportunities, and alternatives.

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1. Introduction

How do life course transitions such as getting married, having children, and losing a spouse affect social contacts? And what is the role of getting older in this process? Several fields in the social sciences have addressed this question in the past. First, there are social gerontologists who have examined this issue. Early gerontological studies pointed to the problem of disengagement, the idea that social isolation would increase as people grow older, resulting in smaller networks and increasing feelings of loneliness (Cumming, Dean, Newell, & McCaffrey, 1960; Cumming & Henry, 1961; Hochschild, 1975). Later studies introduced the notion of socioemotional selectivity, which refers to the tendency of people to invest more selectively

in fewer social contacts as they grow older (Arjouch, Blandon, & Antonucci, 2005; Carstensen, 1992; Lang, Stauding, & Carstensen, 1998; Lansford, Sherman, & Antonucci, 1998). Life course changes in social contact have also been addressed in the social psychology of close relationships. Studies in this field have largely been motivated by the notion of 'dyadic withdrawal,' which is the tendency of people to disengage from their network as they enter into a partner relationship (Johnson & Leslie, 1982; Kim & Stiff, 1991; Milardo, 1982; Milardo & Allan, 2000; Parks, Stan, & Eggert, 1983; Sprecher & Felmler, 2000). Third, there are sociological studies which have examined life course effects. In these studies, life course variables are typically part of a broader set of social and structural network determinants which are examined simultaneously (Burt, 1991; Marsden, 1987; McPherson, Smith-Lovin, & Brashears, 2006; Moore, 1990).

Although studies in all three fields reveal strong effects of age and marital status on social contacts, virtually all studies have been cross-sectional in nature. Hence, what we know about life course effects is largely based on cross-sectional comparisons of marital status categories or age categories (Burt, 1991; Cornwell, Laumann, & Schumm,

[☆] This study has been realized using the data collected by the Swiss Household Panel (SHP), which is based at the Swiss Centre of Expertise in the Social Sciences FORS. The project is financed by the Swiss National Science Foundation.

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2008; Hurlbert & Acock, 1990; Kalmijn, 2003; McDonald & Mair, 2010). One possible disadvantage of a cross-sectional approach is that comparisons of age categories are biased by cohort effects. For example, if more recent cohorts are less integrated socially—something about which there is considerable debate (Fischer, 2009; McPherson et al., 2006)—this could suppress a negative age effect on the size of networks. Another disadvantage lies in selection effects. If well-integrated persons are more likely to marry, this could suppress a negative effect of marriage on the size of networks. Biases may operate as well for parenthood and divorce. Although the strength of such biases may not be all that serious, it is nevertheless important to replicate previous studies with analyses of panel data.

The lack of longitudinal analyses is largely the result of the absence of good panel data that contain repeated measures of social networks or social contacts. Most nationally representative panel data in the United States and in Europe are oriented toward economic, demographic, or health issues. As a result, we know much more about life course effects on employment, income, and health, than about life course effects on social networks. The lack of dynamic network analyses has not gone unnoticed. Since the late 1990s, there has been an increasing number of studies of networks which are truly longitudinal in nature (Suitor, Wellman, & Morgan, 1997). While these analyses are original and innovative in their design, they tend to focus more on the degree of stability and turnover of dyads and networks over time, than on the influence of specific life course transitions (Martin & Yeung, 2006; Morgan, Neal, & Carder, 1996; Wellman, Yuk-lin Wong, Tindall, & Nazer, 1997). There are a few longitudinal analyses of life course effects on social networks but these were either based on small and select samples (Bost, Cox, Burchinal, & Payne, 2002; Terhell, Broese van Groenou, & Van Tilburg, 2004; Van Duijn, Van Busschbach, & Snijders, 1999) or on qualitative methods (Bidart & Lavenu, 2005; Jerrome & Wenger, 1999). An important exception is the study by Shaw et al. in which older adults were followed over a 10-year period. Using individual growth curve models, Shaw et al. show that contacts with friends decline with age whereas contacts with relatives are stable (Shaw, Krause, Liang, & Bennett, 2007). Practical support from the network increases with age, but not emotional support. Although this study is an important methodological step forward, it only addresses age changes (and not life course transitions) and it focuses on a limited age range (65+).

In the present paper, we analyze the link between life course transitions and social contacts using a large nationally representative sample of individuals who were followed annually over a 12-year period, i.e., the Swiss Household Panel (FORS, 2009). We focus on four demographic life course transitions: the entry into marriage or cohabitation, the entry into parenthood (including the aging of the children), the experience of separation, and the death of a spouse. Other aspects of the life course, such as leaving the labor market, becoming unemployed, and retirement, are also included since these will have consequences for social contacts as well and are correlated with the demographic transitions and with age (Cornwell et al., 2008; Lancee & Radl, 2012). Social contacts are

measured for four role relationships (relatives, friends, neighbors, and acquaintances) and a distinction is made between the size of networks, the frequency of contact, and the support received from others. Our paper does not include aspects of community involvement, such as participating in voluntary organizations, political participation, doing paid work, and attending church, as other recent papers have done (Cornwell et al., 2008; Donnelly & Hinterlong, 2010; Voorpostel & Coffé, 2012). Note, however, that in so far as such forms of involvement lead to weak ties, they are likely to be included in the measure of acquaintances used here.

The data are analyzed with fixed-effects regression models which (implicitly) measure *within-person* changes in contact in response to changes in family status. Implicitly, these models control for stable (observed and unobserved) characteristics which may affect networks. We control explicitly for observed changes in other life domains which could affect social networks (changes in employment, income, and health) and which could also be related to changes in family status. We also consider if and to what extent effects differ between men and women as this is an important distinction in previous network studies (Moore, 1990; Ridgeway & Smith-Lovin, 1999). In contrast to many earlier studies which focused on select age groups, such as the elderly or young adolescents, we focus on the entire age range, i.e., from 18 to 96.

2. Earlier research and hypotheses

Social gerontologists found that networks become smaller as people age while support from the network increases, in line with socioemotional selectivity theory (Arjouch et al., 2005; Carstensen, 1992; Lang et al., 1998; Lansford et al., 1998). The amount of contact that people have with non-kin declines with age all through the age continuum whereas the amount of contact with kin begins to decline after age 50 (for women) and 60 (for men) (Cornwell, 2011). Gerontologists also found evidence for activity theory, i.e., the notion that older persons, in order to maintain a certain level of self-esteem and well-being, actively shape their networks after experiencing certain life course transitions (Havighurst, 1961; Moen, Dempster-McClain, & Williams, 1992). An example of such an effect is that widowed respondents have *more* frequent interactions with their network and more close ties than married respondents (Cornwell et al., 2008).

Social psychologists have focused on the link between marriage on the one hand, and relationships with friends and acquaintances on the other hand (Milardo & Duck, 2000). Evidence suggests that after getting a steady relationship and after marrying, people spend less time with the friends they had when they were single, a phenomenon called 'dyadic withdrawal' (Johnson & Leslie, 1982; Kim & Stiff, 1991; Milardo, 1982; Milardo & Allan, 2000; Parks et al., 1983). Marriage also leads to meeting new friends through the partner's network, but these are generally less close. The overall effect of marriage on the intimate network therefore appears negative, despite the fact that the partner's friends gradually become accepted during the course of marriage (Sprecher & Felmlee, 2000).

Sociological studies of social networks have shown that network size decreases with age at an increasing rate (Burt, 1991; Cornwell et al., 2008; Marsden, 1987; McPherson et al., 2006). The relative share of kin ties in the network is highest among both the young and the old. The degree of closeness to network members does not increase with age, somewhat in contrast to socioemotional selectivity theory (Cornwell et al., 2008). Married respondents have fewer nonkin ties and fewer friends in their network than unmarried respondents (Fischer & Olicker, 1983; Hurlbert & Acock, 1990; Kalmijn, 2003; Moore, 1990), in line with the social psychological perspective above. Parenthood initially leads to a decline in the size of the social network but as the children grow older, network size increases and the overall effect of parenthood on networks appears to be positive (Bost et al., 2002; Moore, 1990; Munch, Miller McPherson, & Smith-Lovin, 1997; Nomaguchi & Milkie, 2003).

To develop hypotheses about life course changes in social contacts, we make a distinction between two mechanisms: dispositional or demand side factors on the one hand, and structural or supply side factors on the other hand (Feld, 1981; Kalmijn & Flap, 2001; Marsden, 1990; McPherson, Smith-Lovin, & Cook, 2001; Mollenhorst, Völker, & Flap, 2008). This framework has a close resemblance to the social convoy model in gerontology which argues that personal relationships change because on the one hand, the demands that people have vary at different ages and because, on the other hand, the constraints they face in their life vary with age (Antonucci, 2001; Lang, Wagner, & Neyer, 2009).

Dispositional factors relevant for life course changes are indicated by the concept of *need*. In certain life stages, there is more need to have contact with a certain category of associates and this can alter the number of contacts that people have or the support people get from certain others. Structural factors are indicated by opportunities and alternatives. *Opportunities* are defined as the chances of meeting certain associates. It can be argued that these opportunities are altered as persons go through certain life course transitions. *Alternatives* play a role since demographic life course transitions by definition go hand in hand with a change in personal relationships (e.g., the gain or loss of a spouse and/or children). Since these personal relationships may serve similar functions as networks do, substitution effects are plausible. In sum, we argue that life course changes in social networks are caused by changes in (a) needs, (b) opportunities, and (c) alternatives. Using this

general framework, we develop a set of hypotheses about changes in networks. Table 1 summarizes the theoretical mechanisms.

We start with the influence of marriage. Marriage first changes the alternatives that people have. The spouse is an intimate partner which may serve similar functions as a good friend. Both friends and spouses offer companionship, understanding, and emotional support (Allan, 1979; Pahl, 2000). For this reason, one would expect a decline in friendship networks after people marry. We note, however, that this may depend on the way couples develop their networks. The more couples keep their own networks, and the less they develop common conjugal networks, the weaker the effects of marriage will be (Kalmijn, 2003; Widmer, Kellerhals, & Levy, 2004). It has also been argued that husbands are less willing or able to provide emotional support in the way that female friends do (Barth & Kinder, 1988), which would suggest that for women, there is less competition between spouses and friends (Kalmijn, 2003). A similar substitution effect may occur for family members because the spouse may be an alternative for the emotional support that parents and siblings offer (Sarkisian & Gerstel, 2008). Marriage also changes the opportunities to have contact, however. Through marriage, people gain in-laws which increases the size of the network of relatives. People also get connected to the network of the spouse and this may yield new network members as well. Whether these will also be friends is less clear, however. For cohabitation, we partly expect similar effects because living together takes time away from friends and family members, regardless of the legal form. At the same time, however, it may also be true that cohabiting couples have a more 'separated' social life, which would suggest smaller changes in contact after cohabitation (Kalmijn & Bernasco, 2001).

Becoming a parent first changes the opportunities to have contact, especially for women (Munch et al., 1997). After a child is born, women often have less opportunity to have contact with others because they are more bound to the home and because they are employed less often. Women will therefore have fewer colleagues in their network and perhaps fewer club members as well. After this initial negative effect, however, mothers (and fathers) come into contact with other parents at day care centers, at school, or through their children's friends. This may lead to an increase in the network of neighbors and perhaps also to a larger number of friends. Couples who have children also tend to move to neighborhoods where there are other

Table 1
Summary of mechanisms explaining effects of life course transitions on networks.

	Need	Opportunities	Alternatives (substitution)
Union formation		+ (friends) + (relatives)	– (friends) – (relatives)
Parenthood	+ (neighbors) + (relatives) – (friends)	+ (neighbors)	
Separation and widowhood	+ (neighbors) + (relatives) + (friends)	– (friends) – (relatives)	+ (friends) + (relatives)

parents and where neighboring is more common. Not only the opportunities for contact change, the needs that people have change as well after they have children. For example, the need to have contact with neighbors increases because neighbors can help with caring for or monitoring the children. The need to have contact with relatives increases because relatives, especially parents, can provide child care (Silverstein & Marengo, 2001). The need to have contact with friends may change as well. It has been found in earlier work that people tend to associate with others who are in a similar stage of the life course (Kalmijn & Vermunt, 2007). Becoming a parent may reduce the need or preference to have contact with friends who did not yet become parents. This would lead to a decline in the friendship network unless all friends become parents at the same time, which is unlikely.

What can we expect of the effects of divorce and widowhood? For this transition, the theoretical mechanisms suggest opposite effects. First, we would expect that the loss of a spouse changes the needs that people have. After divorce and widowhood, people often face emotional and practical problems. These problems arise from the adjustment that is needed to a new life, but also from the emotional feelings of loss involved in these transitions. To deal with these problems, people often turn to their network for support (Broese van Groenou & Van Tilburg, 1996). But even if these needs do not change, divorce and widowhood can have positive effects on the network because friends and relatives are alternatives for the support previously received from the spouse. Both these mechanisms suggest positive effects on networks, but there are also reasons to expect negative effects. After divorce, the network which was developed and maintained during marriage can be torn apart. Previous research has shown that common friends face conflicts of loyalty after divorce. Many friends therefore tend to maintain contact with only one of the two ex-spouses (Terhell et al., 2004). Similarly, after widowhood, the weaker ties which the surviving spouse maintained via the spouse may erode. In-laws, finally, may also be lost after divorce, although this surely will depend on other factors as well, such as the presence of children. It is also unclear if people are able to reverse the process of 'dyadic withdrawal' after divorce or widowhood. It can be difficult to rebuild the ties with lost friends especially if these friends do not experience similar transitions.

In some cases, the theoretical mechanisms of need, opportunities, and alternatives have opposite implications. For example, a divorce reduces the opportunities to have contact with the network since part of the network is tied to and lost to the former spouse. The need to have contact with friends and family members, however, increases. To separate these positive and negative effects, we can look at different aspects of the network. For example, we would expect that a divorce results in fewer network members but more support and contact from the remaining members. It should also be noted, that the arguments about need are essentially one-sided. An increase in need will only affect network composition if these other persons are prepared to provide support. For example, a divorce may increase the need for emotional support but not all

friends may be willing to provide that support in the long run. This will also depend on how others perceive the causes of the need that an individual has. For example, few friends and relatives would abstain from helping if someone's spouse dies, but at least some friends and relatives may not be willing to help if a friend decides to divorce and marry a new partner.

3. Data and methodology

3.1. Data

The data we use are from the Swiss Household Panel, which was based on a nationally representative sample of 7799 respondents in 5074 households who were interviewed annually from 1999 through 2010 (FORS, 2009). Respondents were interviewed by telephone and all members of the household were interviewed. Questionnaires were similar in each year, making it possible to examine how social contacts develop over a 12-year period. Although we do not observe the full life course, we observe a part of the life course for all age groups and this makes it possible to construct a dynamic view of the life course. If we assume that the effects of age and life course stage on our outcome variables do not interact with birth cohort, we can reconstruct the entire life course from the combined 12-year individual panels. We must assume that there are no period effects, i.e., no changes in networks between 1999 and 2010 that affected all age groups.

There is a relatively high level of attrition from the panel. In the eleventh year, 59% of the original households still participated. As is the case with other panels, attrition is selective with respect to demographic characteristics and with respect to indicators of social integration. The magnitude of this selectivity appears to be mild, however (Lipps, 2007; Voorpostel, 2009). Nonetheless, given that there is selective attrition, we would expect that the effects of age are too positive because the panel members whose level of integration declines with age are presumably less likely to be represented. In other words, there can be an upward bias in the age effect. For the effects of life course transitions, the direction of bias is not clear beforehand. Research suggests that people are more likely to drop out if they experience changes in family status and employment (Voorpostel & Lipps, 2011). It is less plausible, however, that this biases the effects of these transitions on social contacts. The SHP also provides longitudinal weights for the data that correct for attrition (Plaza & Graf, 2008) but these cannot be easily incorporated in the fixed effect regression models that I use. I compared weighted and unweighted results using normal regression models (i.e., OLS for linear variables and Poisson regression for counts) and found that the results were virtually identical.

For the present analyses, we select respondents who participated at least two times. We select all ages but begin the observation window at age 18. Hence, respondents who were 15 in the first wave enter the person-year file in the fourth wave. Individuals who experienced gaps in participation of four years or more are also excluded (e.g., a person who participated until 2005 and returned in 2010 is excluded). Such long gaps make it more difficult to

attribute changes in social contacts to life course transitions. After these selections, we have 5718 persons who contribute to 44,612 person-years.

3.2. Dependent variables

The Swiss panel is unique compared to most other European panels in that data were collected on social contacts. Although the investigators decided not to use a network name generator procedure like the GSS discussion network module—this was probably too time consuming to do each year—they did ask a series of questions on social contacts which are informative. Questions were asked about four types of relationships: relatives outside the household, close friends, neighbors, and colleagues or acquaintances met during the course of leisure, political, religious, or other activities. We call these latter persons ‘acquaintances.’ For each of these types of persons, four questions were asked. First, the size of this subnetwork was ascertained by asking how many close friends the respondent had, how many relatives, and so forth. For relatives and neighbors, the size of the network pertains to persons with whom the respondent was on good terms and to whom he or she felt close. For acquaintances, closeness was not a criterion, only being on good terms. We recoded network sizes of over 50 to 50. There were few such extreme network sizes (less than 0.5%) and these extreme values could bias the effects. Zero network sizes were included.

Second, a question was asked how frequent contact there was with relatives, friends, and neighbors. Contact was not defined but it was specified that telephone contacts needed to be included. Answers were expressed in the approximate number of times per month. If this number was variable within a subnetwork (e.g., different for different relatives), respondents had to report about the person with whom they had contact most frequently. If a person reports no friends or relatives, the answer was missing so that contact is conditional. However, zero contact is possible. Frequencies over 30 times a month were recoded to 30.

Finally, two questions were asked about the support received from relatives, friends, neighbors, and acquaintances. One question asked about the extent to which respondents could receive practical support from others. Examples of support were given (e.g., doing shopping, giving useful advice). Another question asked about emotional support, which was asked with the following question: “To what extent can these [...] be available in times of need and show understanding, by talking to you, for example?” Both questions could be answered on an 11-point scale, where 0 was labeled “not at all” and 10 was labeled “a great deal.” The two support items were very highly correlated ($r = .60$ for relatives, $.71$ for neighbors, $.67$ for friends, and $.73$ for acquaintances). For this reason, the two were added in one support variable per subnetwork. The resulting support variables were standardized for ease of interpretation ($m = 0$, $s.d. = 1$).

3.3. Independent variables

As independent variables, we first construct time-varying measures of marital status. To simplify things, we

combine separation and divorce (called separation) and we combine married and cohabiting (called union). Using information about current marital status and previous transitions, we constructed 10 different groups of respondents (e.g., married for the first time, separated for the first time, remarried after a first separation, and so forth). We subsequently used a cumulative coding scheme to capture the effects of the following transitions (in parentheses are the numbers of transitions that we observe): (1) entering marriage for the first time (348), (2) becoming separated for the first time (341), (3) becoming a widow(er) for the first time (113), (3) repartnering after a first separation (205), and (4) becoming separated for the second time (86). There were too few transitions from widowhood to repartnering (10) and from repartnering after a second separation (34), so these person-years were excluded.

Parenthood transitions were treated in separate variables. We make a distinction between respondents who never had children, respondents who have children living at home, and respondents whose children had left the home (the empty nest stage). The second category is further differentiated using the age of the youngest child (0–4, 5–12, 13+). In this way, we can see possible effects of the aging of the children in a dynamic way (Munch et al., 1997). We observe 274 transitions to parenthood, 726 transitions from preschool to school-age children, 790 transitions from elementary school to high school-age children, and 344 transitions to the empty nest stage. The childless stage is used as a reference in the model.

We included three socioeconomic control variables: employment status (distinguished in unemployed, working for pay, not in the labor force, and retirement (self-reported)), school enrollment, and a subjective measure of poverty. Poverty was based on the sum of four dichotomous items (not being able to pay bills, not being able to pay the dentist if needed (dentist costs are not covered by health insurance in Switzerland), dissatisfied with one’s financial situation, and financial situation not manageable). Loevinger’s H for this scale is $.59$, which is satisfactory. Loevinger’s H is a measure of reliability for scales consisting of dichotomous items (i.e., Guttman scales). We also included health variables as controls. Health was measured with two variables: (a) the extent to which a respondent’s health is an impediment in his or her everyday functioning, ranging from 0 for “not at all” to 10 for “a great deal,” and (b) a measure for depressed mood (based on a single question about how often the respondent felt blue, desperate, anxious, or depressed, on an 11-point scale). The SHP did not include a more common depression scale such as the CESD.

The socioeconomic variables and health variables could affect the link between life course transitions and contacts. For example, life course transitions affect socioeconomic outcomes, especially for women, and socioeconomic changes can also affect the size and composition of networks (Marsden, 1987; Moore, 1990). Health may play a similar role. It is known that life course transitions such as entering marriage and experiencing a separation affect health (Barrett, 2000; Williams & Umberson, 2004). At the same time, there can be effects of health on contacts, although this is less often recognized (Umberson, Crosnoe,

Table 2
Descriptives of independent and dependent variables.

	Correlation ^a	Mean	S.D.	Minimum	Maximum	N
Number of relatives	.46	6.89	6.35	0.00	50.00	43,659
Contacts with relatives (monthly)	.46	6.67	7.45	0.00	30.00	41,086
Support from relatives	.49	0.00	1.00	-3.38	1.27	41,388
Number of friends	.52	5.36	4.83	0.00	50.00	43,652
Contact with friends (monthly)	.46	6.24	6.72	0.00	30.00	40,730
Support from friends	.44	0.00	1.00	-3.85	1.37	40,100
Number of neighbors	.52	3.27	4.11	0.00	50.00	43,491
Contact with neighbors (monthly)	.44	9.79	8.68	0.00	30.00	31,046
Support from neighbors	.50	0.00	1.00	-2.96	1.72	29,735
Number of colleagues/members	.34	6.62	8.88	0.00	50.00	43,026
Support from colleagues/members	.45	0.00	1.00	-2.82	1.99	29,918
Age (divided by 10)		4.87	1.58	1.80	9.50	43,984
Children 0–4		0.10		0.00	1.00	43,984
Children 5–12		0.16		0.00	1.00	43,984
Children 13+		0.10		0.00	1.00	43,984
Children left home		0.35		0.00	1.00	43,984
Not in labor force		0.12		0.00	1.00	43,984
Unemployed		0.01		0.00	1.00	43,984
Retired		0.18				43,984
In school		0.08		0.00	1.00	43,984
Poverty index		0.00	1.00	-0.53	4.00	43,768
Disability		0.00	1.00	-0.69	3.36	43,952
Depressive symptoms		0.00	1.00	-0.95	3.93	43,951

^a Correlation between consecutive waves.

& Reczek, 2010). Health problems may have both positive and negative effects on contacts. Having a health problem can be a reason to gain support but some network members may also find it difficult to cope with a person who suffers from serious health problems. Means and standard deviations of all the variables are in Table 2.

3.4. Statistical model

Effects of life course transitions are estimated with fixed-effects regression models. Fixed-effects models are probably the most common models for analyzing *within-person* variations in dependent and independent variables when more than two time point are available (Allison, 2009; Petersen, 2004). These models are estimated on a person-year file in which each individual is observed multiple times, depending on how often he or she was included in the panel. The coefficients in the model represent effects of *changes* in the independent variables on *changes* in the dependent variable. For example, the effect of marriage (versus being single), is equal to the difference in contact before and after a person is married. Implicitly, these models take into account the influence of all other (stable) observed and unobserved differences between respondents. Control variables which do not vary over time are therefore not needed in the model. We present models for men and women separately (Tables 3 and 4). The most common form of clustering is having a husband and a wife of the same marriage in the data. Because models are presented separately for men and women, clustering will have a limited effect on the estimates.

Two types of fixed-effects models are used. We use linear fixed-effects models for the support scales since these outcomes are linear. For network size and the number of contacts, we use fixed-effects Poisson regression because

the dependent variables are discrete counts. An assumption of Poisson regression is that the mean is equal to the variance. This assumption is violated in the present case for all outcomes which means that there is overdispersion. One solution is to use a negative binomial regression (e.g., Cornwell et al., 2008), but unfortunately, there is no true fixed-effects version of this model (Allison & Waterman, 2002). The solution which is followed here is to adjust the standard errors for overdispersion, as suggested by Allison and Waterman (2002). The Poisson regression coefficients can be interpreted as changes in the natural logarithm of the count. Hence, $\exp(b)$ can then be interpreted in terms of proportional changes.

4. Findings

In Table 2, we present the correlations between the measures of social contacts in two consecutive years. These correlations are similar to the intra-class correlations that would be obtained from a multilevel model (Snijders & Bosker, 1999). Most of the correlations are between 0.40 and 0.50, which suggests that there is considerable variation within persons over time. Part of this may be due to measurement error, but part may also be due to the life course effects we are interested in.

4.1. Age patterns

We focus first on the question of how social contacts change as people become older. In the models, the effects of age are controlled for the life course transitions. To obtain a view of the overall effect of age, we therefore need to estimate models without these other independent variables. The results of these bivariate models are presented graphically because age was here distinguished in five-year categories. Fig. 1 contains the results for men,

Table 3

Fixed effects regression of network size, contact, and support for men.

Men	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Family (size)	Family (contacts)	Family (support)	Friends (size)	Friends (contacts)	Friends (support)	Neighbors (size)	Neighbors (contacts)	Neighbors (support)	Acquaintances (size)	Acquaintances (support)
Age	-.344* (.024)	-.125* (.030)	-.147* (.051)	-.085* (.022)	-.541* (.065)	.096 (.071)	-.029 (.034)	-.502* (.113)	-.017 (.025)	-.006 (.035)	.180* (.087)
Age squared			.038* (.007)		.036* (.009)	-.018* (.007)		.045* (.010)			-.023* (.009)
Single → union	.196* (.054)	-.020 (.072)	.087~ (.051)	-.048 (.046)	-.257* (.065)	-.154* (.048)	-.111 (.107)	-.039 (.097)	-.039 (.070)	-.130~ (.078)	-.055 (.059)
Union → divorced	-.087 (.071)	.030 (.064)	.019 (.054)	.027 (.044)	.270* (.069)	.158* (.051)	-.082 (.092)	.087 (.082)	-.084 (.077)	-.061 (.086)	.182* (.063)
Union → widowed	-.033 (.137)	.266 (.203)	.208 (.136)	-.263 (.235)	.439* (.208)	.154 (.140)	.185 (.377)	.236~ (.121)	.066 (.161)	.077 (.271)	.161 (.181)
Divorced → reunion	.207* (.077)	-.090 (.092)	-.028 (.064)	.050 (.050)	-.073 (.086)	-.089 (.061)	-.027 (.119)	-.052 (.098)	-.122 (.086)	-.099 (.086)	.043 (.075)
Reunion → divorced	-.129 (.111)	-.290~ (.153)	.047 (.115)	-.129 (.081)	-.002 (.209)	-.123 (.107)	-.038 (.230)	.209 (.198)	.405* (.157)	-.048 (.186)	-.119 (.136)
Kids ≤ 4 (vs. no kids)	.029 (.035)	-.016 (.049)	.016 (.036)	-.070* (.031)	-.070 (.048)	-.077* (.035)	.159* (.052)	.163* (.054)	.024 (.045)	-.026 (.065)	-.088* (.042)
Kids 5–12 (vs. no kids)	.037 (.033)	-.062 (.045)	-.008 (.033)	-.043 (.032)	-.018 (.044)	-.048 (.032)	.217* (.048)	.098~ (.050)	.107* (.040)	.067 (.054)	-.054 (.038)
Kids 13+ (vs. no kids)	.050~ (.029)	-.072~ (.040)	-.080* (.030)	-.007 (.026)	-.006 (.038)	-.031 (.029)	.142 (.044)	.017 (.039)	.033 (.035)	.036 (.044)	-.047 (.034)
Empty nest (vs. no kids)	-.069* (.021)	-.008 (.029)	.080* (.023)	-.055* (.019)	-.030 (.024)	-.005 (.022)	-.040 (.036)	-.022 (.028)	.024 (.028)	-.013 (.034)	-.008 (.027)
Not in labor force (vs. employed)	-.067~ (.039)	-.122* (.052)	-.010 (.041)	-.061 (.039)	-.008 (.040)	.035 (.039)	.116* (.059)	.076 (.055)	.059 (.052)	.028 (.061)	-.023 (.050)
Unemployed (vs. employed)	-.015 (.053)	-.143* (.071)	-.040 (.063)	.132~ (.076)	.039 (.053)	.008 (.060)	-.207* (.094)	.120 (.076)	-.015 (.080)	-.049 (.106)	-.108 (.082)
Retired (vs. employed)	-.015 (.041)	-.091 (.063)	-.019 (.037)	.026 (.038)	-.087~ (.051)	.026 (.037)	.034 (.040)	.086* (.043)	.034 (.042)	-.034 (.055)	-.028 (.046)
School enrolment	.016 (.029)	-.028 (.036)	-.029 (.029)	.038~ (.022)	-.007 (.027)	-.019 (.027)	.011 (.038)	.008 (.039)	.038 (.036)	.077* (.039)	-.040 (.032)
Poverty index	-.000 (.009)	-.002 (.011)	-.008 (.009)	-.008 (.009)	-.008 (.010)	-.009 (.009)	-.017 (.013)	.021~ (.011)	.009 (.011)	-.010 (.011)	.007 (.011)
Disability	.005 (.009)	.008 (.012)	.001 (.009)	.014 (.009)	-.002 (.011)	-.007 (.009)	.013 (.013)	.014 (.010)	.001 (.011)	.024~ (.014)	-.018~ (.011)
Depressive symptoms	-.038* (.011)	.022 (.013)	-.009 (.010)	-.022* (.009)	.015 (.012)	.026* (.010)	-.010 (.013)	-.009 (.012)	-.010 (.012)	-.037* (.015)	.036* (.012)
Constant			-.461* (.181)			.003 (.171)			-.086 (.129)		-.305 (.209)
Shape age effect	L	L	U	L	U	∩	0	U	0	0	∩
Inflection point	Nap	Nap	19	Nap	75	26	Nap	56	Nap	Nap	39
Dominant tendency	-	-	+	-	-	-	0	-/+	0	0	+/-
Chi-square test	311.2*	46.8*	12.1*	55.6*	116.0*	3.4*	49.6*	64.9*	1.8*	29.9*	2.6*
F-Test											
N	18,339	17,153	17,322	18,266	17,085	16,901	17,553	12,758	12,487	17,833	13,149

Note: Fixed effect Poisson regression with robust standard errors for network size and contact frequency. Fixed effect linear regression for network support (standardized scale). Shape age effect based on calculations.

~ $p < .10$.

* $p < .05$.

Table 4
Fixed effects regression of network size, contact, and support for women.

Women	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Family (size)	Family (contacts)	Family (support)	Friends (size)	Friends (contacts)	Friends (support)	Neighbors (size)	Neighbors (contacts)	Neighbors (support)	Acquaintances (size)	Acquaintances (support)
Age	−0.164 [*] (0.068)	−0.021 (0.023)	−0.213 ⁺ (0.063)	−0.022 (0.019)	−0.269 ⁺ (0.085)	0.302 ⁺ (0.063)	0.218 ⁺ (0.109)	−0.219 ⁺ (0.089)	0.221 ⁺ (0.080)	0.095 ⁺ (0.028)	0.060 ⁺ (0.023)
Age squared	−0.014 ⁺ (0.007)		0.040 ⁺ (0.006)		0.017 ⁺ (0.008)	−0.030 ⁺ (0.006)	−0.025 ⁺ (0.010)	0.017 ⁺ (0.008)	−0.020 ⁺ (0.008)		
Single → union	0.201 ⁺ (0.052)	0.151 ⁺ (0.076)	0.111 ⁺ (0.051)	−0.002 (0.038)	−0.332 ⁺ (0.060)	−0.127 ⁺ (0.049)	−0.070 (0.107)	0.119 (0.110)	−0.159 ⁺ (0.076)	−0.087 (0.067)	−0.044 (0.059)
Union → divorced	−0.213 ⁺ (0.048)	0.023 (0.056)	0.085 [~] (0.046)	0.023 (0.040)	0.153 ⁺ (0.059)	0.063 (0.044)	−0.065 (0.078)	−0.009 (0.065)	−0.039 (0.060)	−0.038 (0.076)	0.091 (0.057)
Union → widowed	−0.065 (0.075)	0.151 (0.104)	0.306 ⁺ (0.061)	0.064 (0.087)	0.210 ⁺ (0.073)	0.249 ⁺ (0.063)	−0.008 (0.084)	−0.014 (0.060)	0.369 ⁺ (0.075)	−0.019 (0.101)	0.051 (0.088)
Divorced → reunion	0.147 ⁺ (0.052)	−0.152 ⁺ (0.075)	−0.102 [~] (0.061)	0.016 (0.055)	−0.328 ⁺ (0.074)	−0.095 (0.058)	−0.119 (0.093)	−0.010 (0.072)	−0.166 ⁺ (0.081)	−0.050 (0.089)	−0.006 (0.074)
Reunion → divorced	−0.133 ⁺ (0.065)	0.170 (0.105)	0.129 (0.083)	−0.144 ⁺ (0.071)	0.164 [~] (0.087)	0.347 ⁺ (0.081)	−0.019 (0.129)	−0.151 (0.109)	0.092 (0.102)	0.015 (0.111)	0.103 (0.107)
Kids ≤ 4 (vs. no kids)	0.017 (0.033)	0.056 (0.041)	−0.051 (0.034)	−0.075 ⁺ (0.032)	−0.215 ⁺ (0.042)	−0.127 ⁺ (0.033)	0.305 ⁺ (0.056)	0.280 ⁺ (0.047)	0.161 ⁺ (0.043)	−0.195 ⁺ (0.049)	−0.152 ⁺ (0.042)
Kids 5–12 (vs. no kids)	−0.008 (0.029)	0.007 (0.037)	−0.035 (0.029)	−0.091 ⁺ (0.028)	−0.029 (0.037)	−0.055 [~] (0.029)	0.268 ⁺ (0.046)	0.238 ⁺ (0.041)	0.223 ⁺ (0.036)	−0.058 (0.043)	−0.087 ⁺ (0.036)
Kids 13+ (vs. no kids)	0.020 (0.023)	0.008 (0.032)	−0.025 (0.025)	−0.045 ⁺ (0.022)	−0.004 (0.030)	0.010 (0.025)	0.141 ⁺ (0.035)	0.074 ⁺ (0.032)	0.108 ⁺ (0.031)	−0.012 (0.036)	−0.031 (0.031)
Empty nest (vs. no kids)	−0.106 ⁺ (0.017)	−0.001 (0.024)	0.006 (0.020)	−0.037 ⁺ (0.017)	−0.022 (0.021)	−0.007 (0.020)	−0.022 (0.029)	0.001 (0.023)	0.030 (0.025)	0.012 (0.028)	−0.032 (0.026)
Not in labor force (vs. employed)	0.018 (0.020)	−0.009 (0.024)	−0.017 (0.021)	−0.001 (0.017)	0.048 [~] (0.025)	−0.046 ⁺ (0.020)	0.050 [~] (0.028)	0.028 (0.024)	0.009 (0.025)	−0.047 (0.032)	−0.132 ⁺ (0.027)
Unemployed (vs. employed)	0.047 (0.047)	0.109 ⁺ (0.050)	0.060 (0.046)	−0.026 (0.031)	−0.026 (0.044)	−0.010 (0.045)	0.053 (0.061)	0.052 (0.059)	0.012 (0.056)	0.156 ⁺ (0.076)	−0.086 (0.060)
Retired (vs. employed)	−0.027 (0.035)	−0.073 [~] (0.044)	0.017 (0.030)	−0.004 (0.029)	0.087 ⁺ (0.040)	−0.021 (0.030)	0.089 ⁺ (0.045)	0.034 (0.033)	−0.047 (0.036)	−0.030 (0.048)	−0.116 ⁺ (0.041)
School enrolment	0.033 (0.027)	−0.057 [~] (0.033)	−0.031 (0.027)	0.025 (0.019)	0.078 ⁺ (0.027)	0.024 (0.026)	0.017 (0.040)	−0.022 (0.034)	−0.071 ⁺ (0.034)	0.045 (0.038)	0.024 (0.032)
Poverty index	0.001 (0.007)	0.008 (0.008)	−0.018 ⁺ (0.007)	0.000 (0.006)	0.008 (0.008)	−0.005 (0.007)	−0.003 (0.010)	−0.001 (0.008)	−0.023 ⁺ (0.009)	0.011 (0.012)	−0.021 ⁺ (0.009)
Disability	0.027 ⁺ (0.007)	0.007 (0.008)	−0.007 (0.007)	0.003 (0.006)	0.008 (0.008)	−0.008 (0.007)	0.025 ⁺ (0.010)	0.016 ⁺ (0.007)	0.001 (0.008)	0.007 (0.011)	−0.008 (0.009)
Depressive symptoms	−0.030 ⁺ (0.008)	−0.006 (0.008)	−0.016 ⁺ (0.007)	−0.014 ⁺ (0.007)	0.001 (0.009)	−0.004 (0.007)	−0.016 (0.010)	−0.000 (0.008)	−0.003 (0.009)	−0.029 ⁺ (0.012)	−0.005 (0.010)
Constant			−0.049 (0.158)			−0.478 ⁺ (0.155)			−0.386 [~] (0.206)		−0.113 (0.114)
Shape age effect	∩	0	∪	0	∪	∩	∩	∪	∩	L	L
Inflection point	−58	Nap	27	Nap	78	50	44	66	56	Nap	Nap
Dominant tendency	−	0	+	0	−	+/-	+/-	-/+	+/-	+	+
Chi-square test	461.2 ⁺	32.2 ⁺		25.3 ⁺	163.2 ⁺		76.4 ⁺	78.0 ⁺		57.2 ⁺	
F-Test			16.8 ⁺			6.1 ⁺			5.0 ⁺		4.8 ⁺
N	25,091	23,719	24,066	24,977	23,424	23,199	24,109	17,748	17,248	24,079	16,769

Note: Fixed effect Poisson regression with robust standard errors for network size and contact frequency. Fixed effect linear regression for network support (standardized scale).

~ $p < .10$.

* $p < .05$.

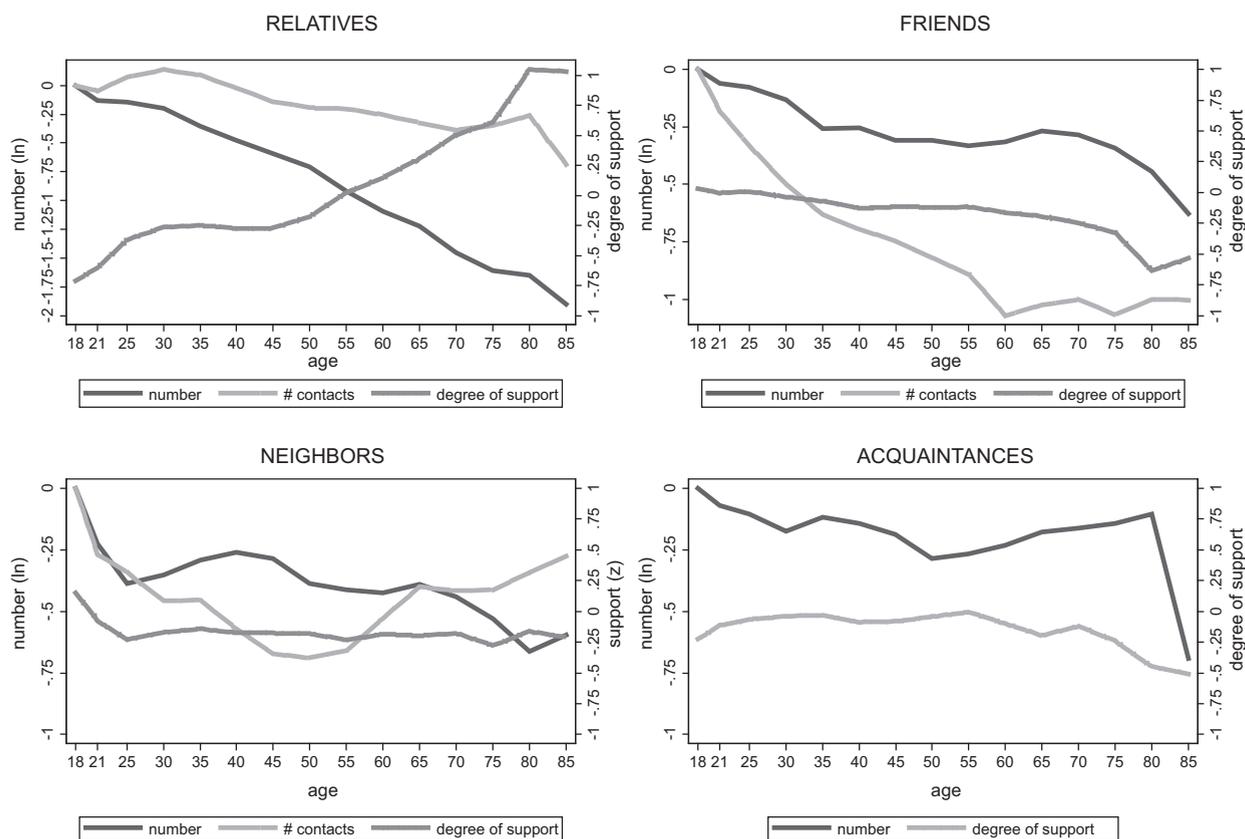


Fig. 1. Men's changes in networks (fixed effects estimates).

Fig. 2 for women. The size of the network and the number of contacts are displayed on the left-hand vertical axis, which is a log scale. The amount of support, which is displayed on the right-hand vertical axis, is a standardized score.

The figures show a steady decline in the number of relatives and the degree of contact with relatives as people grow older. The degree of support from relatives, however, increases as people grow older. These changes are observed for both men and women. The patterns are in line with the notion of socioemotional selectivity: as people grow older, there are fewer but more supportive people in the network. We note that opportunities will play a role here as well. As people age, they first lose their parents and aunts and uncles and later on, those who survive, will also lose their siblings. Nieces and nephews can in principle replace these ties, but such ties are generally weaker than ties to siblings (Rossi & Rossi, 1990), and hence, these are less likely to become part of the network of relatives. Remember that the network of relatives refers to relatives with whom the respondent was on good terms and to whom he or she felt close.

The age pattern of friendships is different. For men, we see a decline in all three indicators: as men become older, they have fewer friends, less frequent contact with friends, and less support from friends. For women, these changes are less pronounced. There is a decline in the number of friends as well, but support and contact do not decline for

women, except at the very old ages. The gender difference in the age patterns of friendships is striking. We come back to this in the conclusion.

The role of neighbors in the network also changes with age. The number of (important) neighbors declines for both men and women but the amount of support does not decline. Contact shows a nonlinear pattern, with a decline as people enter midlife and an increase after that. This suggests that as people age, a more select number of neighbors may become increasingly important. Changes in acquaintances are more modest. We see an increase in the number of acquaintances with age for women but not for men. Support from acquaintances increases modestly for women but again not for men.

4.2. Stage effects

We now turn to the effects of life course transitions, while controlling for age and other independent variables (Tables 3 and 4). The magnitude of the effects can be interpreted in a meaningful way. For size and contact, the effects are equal to the proportional change in the number of network members and the number of contacts. For support, which is a standardized variable, the effects are equal to Cohen's d , a common measure of effect size (i.e., the difference in the dependent variable between two categories divided by the standard deviation of the dependent variable).

We focus first on the effects of union formation. Tables 3 and 4 show that for both men and women the number of relatives in the network increases by 22% after people enter a union ($e^{-.196}$ and $e^{.201}$). The amount of contact with relatives and the degree of support they give also increase after union formation but primarily for women. The increase in network size will in part be the reflection of the addition of in-laws to the network. Union formation also affects the friendship network. Although the number of friends does not decline after union formation, the amount of contact with friends declines considerably (by 23% for men and 28% for women). The expected amount of support from friends also declines after union formation but these effects are relatively modest ($-.15$ for men and $-.13$ for women). We see no significant effects of union formation on neighbors and on acquaintances except for a small negative effect of union formation on the support that women receive from neighbors. That primarily friendships and not neighbors and acquaintances are affected (negatively) points to the mechanism of alternatives: Spouses and good friends fulfill similar functions, whereas spouses and neighbors/acquaintances do not.

We also tested the difference between marriage and cohabitation. To do this, we selected respondents who were either single and never in a union or respondents who were married or cohabiting for the first time. We include the effect of union formation and we add an effect of being officially married. This latter, cumulative dummy variable indicates if marriage has stronger or weaker effects than

cohabitation. Few of the cumulative effects are significant. One exception is that there are differential effects on neighbors. After union formation, men report fewer neighbors ($b = -.275, p < .05$) but if they marry, this is not the case ($b = -.275 + .294 = .019, p > .05$). For women, we find similar effects ($b = -.184$ for union formation and $b = -.184 + .231 = .046$ for marriage). Hence, for those who enter an unmarried cohabiting union, the number of neighbors in the network declines. Perhaps there is less acceptance of unmarried cohabitation in the neighborhood. Alternatively, people who enter an unmarried union may decide to live in areas where neighborhood cohesion is weaker (e.g., larger cities). For women, we also find stronger positive effects of marriage than of cohabitation on the number of family members ($b = .152 + .218 = .370$) and stronger negative effects on support from friends ($b = -.111 + -.111 = -.222$).

We now turn to the effects of parenthood. Becoming a parent leads to a decline in the friendship network. After a child is born, respondents have (somewhat) fewer friends, less frequent contact with friends, and less expected support from friends. The effects are significant for men and women with the exception of the effect on contacts for men. A similar conclusion applies to acquaintances. Parenthood has a negative effect on the number of acquaintances and a negative effect on support from acquaintances. These changes may be related to employment changes and to declines in participation in clubs. These two negative changes are compensated, however, by

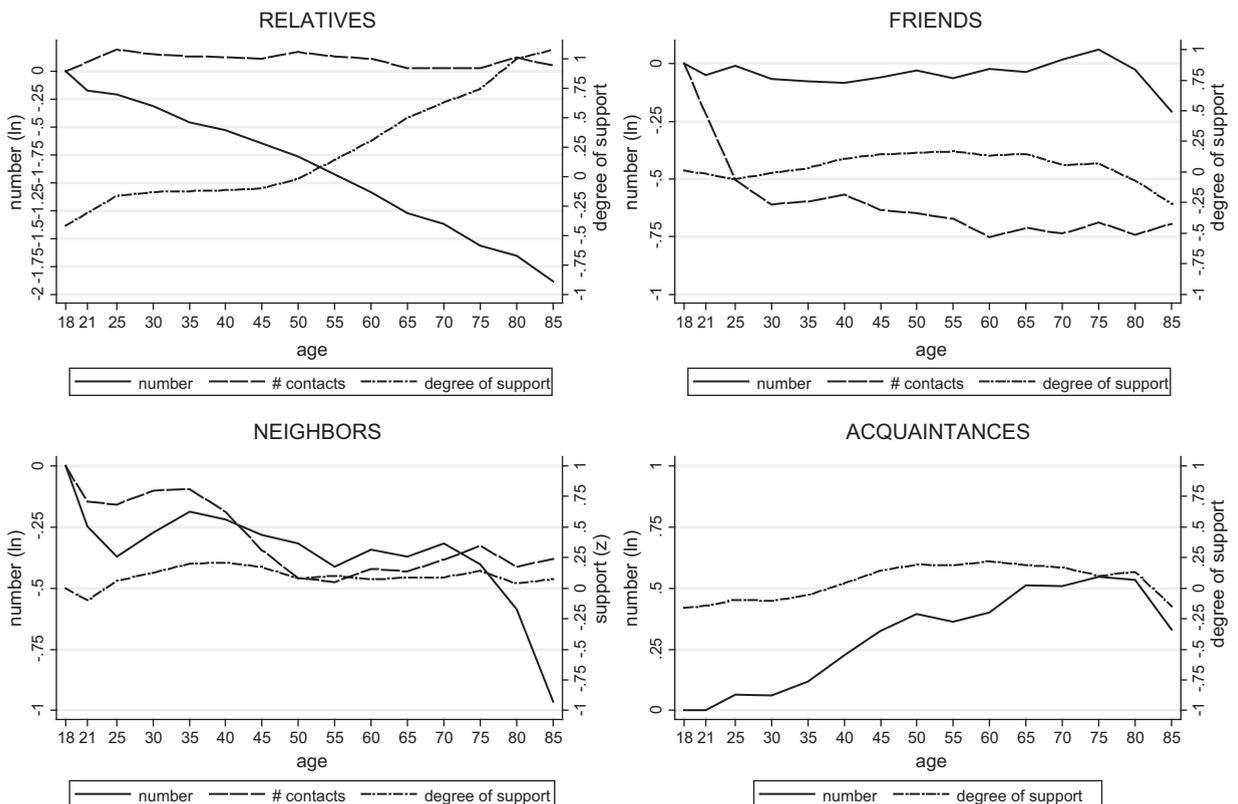


Fig. 2. Women's changes in networks (fixed effects estimates).

positive effects of parenthood on neighbors. After respondents become parents, they report more neighbors to whom they feel close and they report more frequent contact with and support from neighbors. These effects are especially strong for women. These findings may point to increased opportunities to meet neighbors after becoming a parent and to more need for support from people who live close by. Parenthood has no effects on relatives.

How do contacts change as children grow older? To examine this, we look at the variables for the youngest child being 5–12 and the youngest child being 13–18. The reference group for these variables is people who never had children. In general, we see that the negative effects on friends are more pronounced for the first stage of parenthood (0–4) than for the later years (5+). The positive effects of parenthood on the number of neighbors and the amount of contact with neighbors become somewhat weaker when the youngest child is 12 years and older. When people enter the empty nest stage, their contacts are again similar to the time when they did not have children yet.

What are the effects of separation? We first observe a decline in the number of relatives after separation for women. There are no changes in contact and support from relatives. The effect on the size of this subnetwork is probably due to the removal of in-laws from the network. The effect is only significant for women. Why there is no negative effect of separation on men's relatives is unclear (the entry into a union did have a positive effect on the number of relatives for men). The effects of separation on friendship networks are more or less the opposite of the effects of union formation: after separation, people have more frequent contact with friends (men and women) and they receive more support from friends (men). However, the positive separation effect on friendship contact for women is weaker than the negative union formation effect. Hence, for women, there is no return to the stage of being single. The transition to separation has few effects on neighbors and acquaintances, with the exception of a positive effect of separation on support from acquaintances for men. Colleagues and club members are apparently an important source of support for separated men.

What are the effects of widowhood? And are these effects comparable to those of separation? We see that there are both parallels and differences. After the death of a spouse, men' and women's contacts with friends increase. For women, there are also effects of widowhood on support. After becoming a widow, women receive more support from relatives, from friends, and from neighbors. Although these findings clearly reflect the need for such support, it is noteworthy that separation, which may also increase the need for support, did not have such broad effects on support. We come back to this in the conclusion.

What are the effects of repartnering on contacts? Since the effect coding is cumulative, the effects in [Tables 3 and 4](#) represent the contrast between the situation after repartnering and during separation. For men we hardly see effects of repartnering but for women, effects of repartnering are often negative. When separated women repartner, they have less contact with relatives and friends

and receive less support from relatives and neighbors. The effects of separation after repartnering are not consistently pointing in one direction. Perhaps the small number of cases plays a role here.

What are the effects of age when life course transitions are taken into account? To answer this question, we discuss the effects of age in the multivariate models. To simplify matters, we include a linear and quadratic term for age. The quadratic term is only included when it is significant. We calculated the inflection point of the non-linear effect to facilitate the interpretation. These effects are listed at the bottom of [Tables 3 and 4](#). Note that a curvilinear effect does not always mean that the age effect changes direction, this depends on where the inflection point is located. For that reason, we also present the 'dominant tendency' of the age effect. For example, support from relatives has a U-shaped age-pattern with an inflection point at age 19; this means that support increases all through the observed age range (although at an increasing rate).

The age effects on relatives are similar to those observed in [Figs. 1 and 2](#). The number of relatives and contact with relatives (for men) decline with age but support increases. We also observe strong negative effects of aging on men's friendships. For women, these effects are not so clear. For both men and women, we see a curvilinear pattern of neighborhood contact: a decrease up to age 56–65 and an increase after those ages. The age effects on acquaintances are positive for women: as they age, they have more acquaintances and also receive more support from them. For men, these effects are less clear.

Finally, we discuss the most relevant effects of the employment transitions. For men, we see a negative effect of retirement (compared to being employed) on contacts with friends and a positive effect on contacts with neighbors. This suggests a shift toward more local ties after retirement, which is plausible. Becoming unemployed, however, reduces the number of neighbors in the network while it increases the number of friends. Hence, unemployment has a very different effect than retirement. Transitions out of the labor force are most common for women and these only appear to reduce the amount of support from acquaintances. Since these include colleagues, this is an obvious effect. For women's retirement, we also see a positive effect of retirement on neighbors (size) and also a negative effect on support from acquaintances, but not the negative effect on contacts with friends that we found for men. Hence, for women, there is also a shift toward local ties but friendships do not suffer.

5. Conclusion

Using a large nationally representative survey, this paper has analyzed life course changes in social contacts and social networks. The focus was on the role of age and the role of marital and parental status transitions. Although previous studies have also analyzed such effects, few studies were based on (large-scale) panel data. Moreover, many studies have focused on specific segments of the life course (the old, the young) or on specific life course transitions (divorce, children). This paper has

examined the full age range and has covered all transitions, from entering a union and having children, to separation and widowhood. Fixed-effects regression models were used so that we essentially observe changes in social contacts and networks *within* persons. Although the network indicators have some limitations, the nationally representative scope of the data, the consistent year-to-year measurement, and the relatively long duration of the panel (12 years) make the SHP data a unique source of information on change and stability in social contacts.

Our models first show that union formation does not affect the weaker ties that people have while it does change the nature of the stronger ties that people have. After union formation, friends become less important and relatives become more important. Second, parenthood entails a shift toward more local ties. After becoming a parent, friends and acquaintances become less important and neighbors become more important, especially for women. Third, separation and widowhood often have positive effects on contact and support.

Theoretically, we combined ideas from the sociology of networks (Marsden, 1990), social gerontology (Antonucci, 2001), and the social psychology of close relationships (Milardo & Duck, 2000). Three mechanisms were assumed to play a role in changing social networks during the life course: changing needs to have contact, changing opportunities for contact, and alternatives for contact. What are our findings saying about these three notions?

The role of alternatives is very clear from the analyses. The entry into a union has negative effects on the closest segment of the network (friendships), but not on neighbors and acquaintances. Since friends serve similar functions as the spouse, whereas neighbors and acquaintances do not, this is in line with the mechanism of alternatives. To some extent, we can also see the role of alternatives in the reverse effects: after separation and widowhood, support from and contact with friends increase again. However, these latter effects can also be due to increases in the need for support. After all, the loss of a spouse can be a traumatic experience which creates a need for emotional and practical support from others.

There is also more direct evidence for the mechanism of need because the positive effects of widowhood on support (at least for women) are generally stronger in an absolute sense than the negative effects of entering a union on support. Moreover, the positive effects of widowhood also apply to weaker ties such as neighbors, ties that were not (negatively) affected by entering a union.

The role of opportunities is also reflected in the results. The best evidence for this is an increase in the importance of neighbors after becoming a parent, especially for women. Parenthood increases the amount of time women (and to a lesser extent men as well) are at home, it generally leads to migration to neighborhoods where other parents live and where neighboring is more common, and it creates opportunities to meet adults through the networks of one's children (Munch et al., 1997). The mechanism of opportunities can also be seen in the effects of union formation (positive) and separation (negative) on

the number of relatives. These transitions lead to the addition and removal of in-laws from that segment of the network.

Finally, we looked at the effects of age. Although the age effects are complex, two patterns seem to be emerging. One pattern is that during most of the life course, the sizes of the various subnetworks tend to decline. Women's network of colleagues and acquaintances from clubs is an exception, this subnetwork increases with age. That the general pattern is toward smaller networks is consistent with most social gerontological studies. We also note that this finding is not likely to be biased by panel attrition; attrition would lead to larger networks over time. For men, the most interesting finding here is the strong decline in the number of friends, even when life course changes are taken into account. A second age pattern is that support from relatives increases as people become older, while support from other types of contacts does not change so much and support from friends even declines (for men). These effects have been observed before and have been regarded as consistent with socioemotional selectivity theory which argues that people increasingly invest in fewer contacts that yield more emotional or practical benefits (Carstensen, 1992; Shaw et al., 2007). We note, however, that this interpretation depends on the assumption that relatives are the most intimate ties that people have. For many people, friends would be just as close as relatives but we do not see an increase in support from friends as people age. In our view, more research and other theories are needed to understand why relatives become more important *than* friends as people become older.

We abstained from testing gender differences but the effects appear broadly similar, with some exceptions. Especially interesting is that for women, there are more significant effects of widowhood on support received from the network. This may be due to the small number of widowhood transitions for men but the effect sizes are also quite modest for men. One interpretation lies in the principle of reciprocity: if men offer less support to others while being married, they may receive less support when they need it while they are on their own (Ha, Carr, Utz, & Nesse, 2006). Another interpretation is that men are more likely to frame support in terms of contact. For example, losing a spouse has no effect on the support that men receive but it did have a positive effect on men's contacts with friends and neighbors.

Finally, we found that the (negative) effects of age on friendships only apply to men. This difference may be understood in terms of gender roles. When gender roles are traditional, it is not only the case that men invest more in their human capital, it may also be the case that men invest less in their social ties (Smith-Lovin & Miller McPherson, 1993; Umberson, Chen, House, Hopkins, & Slaten, 1996). Because continued investments are an important requirement for the stability of friendships (Rusbult, Martz, & Agnew, 1998), this may explain why men gradually lose friends as they become older. Future research is needed to replicate the interaction between gender and age on friendships and new data are needed to test the hypothesis explaining the interaction.

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