Network size and support in old age: differentials by socio-economic status in childhood and adulthood

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ABSTRACT

This paper examines the impact of childhood and adulthood socio-economic status (SES) on personal network characteristics in later life. Data are derived from 2,285 married older adults (born between 1903 and 1937) who participated in face-to-face interviews for the Dutch survey on 'Living arrangements and social networks of older adults' conducted in 1992. Childhood and adulthood SES were indicated by the father's and own level of education and occupation. Multivariate analyses showed that SES in adulthood has more impact on network features in old age than father's SES. People with low lifetime SES or with downward SES mobility had small networks, low instrumental and emotional support from non-kin, but high instrumental support from kin, when compared with the up-wardly mobile or those with high lifetime SES. The level of education was a better indicator of network differences than occupational prestige. It is concluded that obtaining a high SES during life pays off in terms of having more supportive non-kin relationships in old age. The small networks and less supportive non-kin relationships of low-status older adults make them more vulnerable to situations in which kin are unavailable or less willing to provide support. This study underscores the distinction between types of support and types of relationships in the SES–network association. Further research on the social pathways of socio-economic inequality in health and wellbeing should take these distinctions into account.

KEY WORDS – socio-economic status, personal network, support, old age.

Introduction

More than two decades of network research has shown the beneficial effects of personal relationships for physical and mental wellbeing (Berkman *et al.* 2000). Although the positive aspects of relationships apply to all age groups, the number and content of personal relationships differ in old

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age. These variations are partly due to different structural opportunities in developing and maintaining a personal network, which in turn vary by gender, age and socio-economic status (SES) (*e.g.* Blau 1977; Allan and Adams 1989). Compared to gender and age, socio-economic differences in social relationships of older people have received relatively little attention. Yet, network studies of older people (Antonucci 2001; Smith and Baltes 1998; Wenger 1995) and the general population (Fisher 1982; Marsden 1987; Moore 1990) have consistently indicated SES differences in network size and composition: people with low SES (indicated by a low level of education, occupational level or income) have smaller networks with a larger proportion of kin relationships compared to those of higher status.

The availability and support potential of relationships is perhaps most important in late life. A supportive network facilitates the adjustment to negative life events, such as widowhood and declining health, that are characteristic of old age. More detailed information about the inequality in network relationships is needed to elucidate the social pathways that lead to SES inequalities in health (Kawachi and Berkman 2000; Seeman and Crimmins 2001), in loneliness (Dykstra and de Jong Gierveld 1999), and in subjective well-being (Pinquart and Sörensen 2000).

When studying SES differentials in social networks in old age, it should be borne in mind that 'old age is part of a long life journey' (Hagestad 2002: 135), and that both SES and the network may have undergone considerable changes during the lifecourse. In fact, SES differences in the late-life network may be better understood if the personal history of socio-economic status is taken into account. Having a low socio-economic status during one's entire life implies the accumulation of restricted or disadvantaged circumstances, which contributes to an increased risk of health problems in later life (Davey Smith *et al.* 1997). The benefits of upward socio-economic mobility during life have been proven for health outcomes, but there is no empirical evidence that shows that (positive) changes in SES during life are accompanied by (positive) changes in social resources such as the personal network. The lifespan view, as adopted in this study, will provide more insight into which older adults are socially at risk, and which particular features of the network are associated with lifetime socio-economic status. The present study examines three facets of the relationship between SES and the social network in later life: (1) SES differences in two types of support (instrumental and emotional) and in two types of relationships (kin and non-kin); (2) the relative impacts of childhood SES and adult SES, including upward and downward inter-generational mobility; and (3) variations in the

SES–network association for two different SES indicators: level of education and occupational prestige.

Socio-economic inequalities in personal network features

Most of the available information on the SES–network association refers to descriptive features such as size and composition. A positive association between SES and network size is particularly found for the partial network of non-kin: those with high status have more friends but the same number of kin relationships as those of low status (Campbell, Marsden and Hurlbert 1986; Johnson 1994). A possible explanation is that networks are 'social resources' (Coleman 1988; Kawachi and Berkman 2000; Lin 1982). High-status persons have relatively numerous 'weak ties' (Granovetter 1973) to individuals who have wide networks themselves and provide links to diverse information as well as additional ties. Deriving from their larger human capital (a higher educational level), those with high status are better equipped to make use of their network resources, resulting in, for example, a new job or private domestic care, but also in relatively large networks with non-kin.

There is also empirical evidence of status differences in relationship content (contact frequency and support exchange). Most studies found a positive association between SES and network support (Marmot *et al.* 1998; Matthews, Stansfield and Power 1999), but the source of support seems important in this respect. Higher SES persons receive more support from friends and other non-kin (Krause and Borawski-Clark 1995; Pyke and Bengtson 1996), whereas lower SES persons receive more support from kin (Wenger 1995). With regard to type of support exchanged, negative associations were found between SES and both instrumental and emotional support in parent-child relationships (Antonucci, Ajrouch and Janevic 2003; Greenwell and Bengtson 1997; Merrill 1997), whereas positive associations were found for both types of support when the support covered relationships with both kin and non-kin (Matthews, Stansfield and Power 1999). These studies indicate that the type of relationship in which support is exchanged may be more related to SES than the type of support per se, yet information on the association between SES and types of support in different types of relationships is lacking.

In the present study we examine SES inequality in five network features: size, and instrumental and emotional support from kin and from non-kin. In line with previous network studies, we expected to find positive associations between SES and network size and (instrumental and

emotional) support from non-kin. A negative association was expected between SES and (instrumental and emotional) support from kin.

Lifetime socio-economic status

During the lifecourse the personal network operates as a 'convoy' of personal relationships (Kahn and Antonucci 1980), with fairly stable core relationships and more unstable relationships in the outer reaches of the network. The personal network in later life reflects opportunities and choices made earlier in life about developing and maintaining certain personal relationships. Changes in SES during the lifecourse, from childhood to late adulthood, represent such changing opportunities and may thus have an effect on the personal network. Childhood SES is a proxy for several aspects of the living situation in the early years of life. Besides health behaviour (eating, smoking and drinking habits) of the parents and the housing and neighbourhood characteristics (related to health and safety conditions) (Van de Mheen *et al.* 1997), the child incorporates cultural values regarding, among other things, communication and gender roles, and is trained in social skills. As a result of their upbringing, lower-status individuals may prefer that social relationships provide instrumental rather than emotional support exchanges. In such ways, childhood SES associates with features of the network in later life. Older people have had a lifetime to deal with their childhood experiences, however, and may develop other preferences and resources regarding personal relationships. A change in preferences is more likely to be the case when a person outgrows their childhood socio-economic status. Arising from the increasing opportunities for education in the twentieth century, many older people have attained a higher status compared with their parents. It is assumed that upward inter-generational mobility has changed the opportunities for developing networks and successive cohorts' network preferences. Downward mobility should have decreased the opportunities for networking.

It was expected that both childhood and adult status would be positively associated with network size and support, but that the influence of adult status would be greater. This led to the hypothesis that people with low SES in both childhood and adulthood would have the smallest networks, receive most support from kin and least support from non-kin; and that the low levels would, in rank order, contrast with people who have experienced downward SES mobility, those with upward SES mobility, and those with high SES in both childhood and adulthood.

Indicators of socio-economic status

There has been much debate as to what are the most appropriate in-
dicators of SES in late life (Grundy and Holt 2001). The most commonly
used are level of education, level or prestige of occupation, and income.
These three represent different dimensions of life that are assumed to affect
in different ways both health and social relationships (Lynch and Kaplan
2000; Mackenbach, Van de Mheen and Stronks 1994). Educational level
refers to the availability of cognitive resources and skills (as learning, col-
lecting information, knowing your way around) that are useful in de-
veloping social relationships. Occupational level or prestige indicates
working conditions but also the access to blue or white-collar colleagues
with whom social norms and values are exchanged. Income represents
the material component that indicates the ability to buy good food, live
in quality housing and to join clubs and organisations – all of which in-
crease social participation and the personal network. The use of all three
indicators is problematic in older populations (Grundy and Holt 2001).
Educational level is largely established early in life, which solves problems
of causality with respect to health status, but it is strongly age-related.
Today's older birth cohorts had fewer opportunities to reach high levels
of education compared with younger cohorts (Mayer and Wagner 1993).
Occupational level is more likely to indicate a life-long attribute, but gen-
der differences are problematic. Many older women did not develop pro-
fessional careers and left the labour market after marriage, resulting in a
'false' bias to lower levels of SES in late life (Arber and Ginn 1993). Using
household measures instead of individual measures of SES can circumvent
the invalid gender differential. Differentials in health for married women
were found greater using SES based on the husband's occupation than a
measure based on their own occupations (Grundy and Holt 2001). Many
older women are no longer married, however, and when the information
about the husband is missing, the SES of the single older women may
be underestimated. Income as an indicator of SES is strongly linked to
occupational level and has the same gender problems. In addition, income
indicates current material conditions and does not reflect the skills or assets
that were required during their lives.

   This study has examined the impact of both childhood and adulthood
SES on the personal network. The dataset holds information on the level
of education and on occupational prestige for both the respondent and his
or her father. There is no information on the level of income during child-
hood, so income could not be used as an SES indicator, and the father's
level of education and occupational prestige are surrogates for childhood
SES. The available data allowed us to explore whether educational level

or occupational level was a better indicator of network differences in late life. As both SES indicators are strongly related to age, the interaction effects were examined. Because gender and marital status differences in SES distort a thorough examination of the associations between age, childhood SES, adulthood SES and network features in late life, SES was measured at the household level and the study was limited to married men and women.

Methods

The study sample

The data derive from a survey of the *Living Arrangements and Social Networks of Dutch Older Adults* (Knipscheer *et al.* 1995). In 1992, face-to-face interviews were conducted with 4,494 respondents in The Netherlands, a stratified random sample of men and women born during 1903 to 1937. The sample was drawn from the population registers of 11 municipalities.[1] The response rate was 62 per cent. People from ethnic minorities constituted less than one per cent of the sample. The oldest, and particularly oldest men, were over-sampled. As indicated earlier, the sample was homogenised by only including married men and women living with their spouse (n = 2,543). Respondents with missing data on personal network size (n = 119), supportive exchanges (n = 13), or adulthood (n = 10) or childhood socio-economic status (n = 116) were excluded, leaving 1,378 men and 907 women. The usual reason for missing data was that an abridged version of the questionnaire had been used for respondents who were too physically or cognitively frail to cope with the full questionnaire (n = 121).[2]

Measurements and indicators

For *adult SES* the level of education of the respondent was assessed by the question 'What is the highest level of education that you completed (*i.e.* received a diploma)?' The answers ranged from elementary school not completed (coded 1) to university level (coded 9). Questions were asked on the type of occupation for current and earlier employment status, *e.g.* 'What is your current occupation?', 'What was your last occupation before retirement?'. The occupations have been coded according to the Occupational Classification 1992 of *Statistics Netherlands*, and then converted to an ordinal prestige scale developed by Sixma and Ultee (1983). Scores range from 0 (low) to 100 (high). For example, a 'cleaning person' scores 20 on the scale, and a 'university tutor' has a prestige score of 75. When there was more than one prestige score available, the highest was taken. The same questions were asked about the educational level and occupational

prestige of the spouse. The partner's score was taken if the respondent's score was lower. For education, this occurred for 15 per cent of men and 49 per cent of women. For prestige, this occurred for 13 per cent of men and for 60 per cent of women. An additional 12 per cent of the women had never been employed and consequently their husband's score was taken.

For *childhood SES*, questions were asked about the educational level of both parents and on the last occupation of the father. To obtain one score for the parents' education, the highest score was taken; for six per cent of the respondents, father's education was replaced by mother's education. Upward and downward inter-generational mobility was assessed by dichotomising the SES indicators. A low level of education was defined as elementary school or less; a low occupational prestige was defined by the lowest quartile (a score of 33 or less). For descriptive analyses only, four sub-groups were formed by combining father's and respondents' SES: lifetime low SES (father low, respondent low), downward mobility (high-low), upward mobility (low-high) and lifetime high SES (high-high). In the multivariate analyses the continuous scores of level of education and occupational prestige were used.

For *the personal network*, relationships were identified using a domain-specific approach (Van Tilburg 1995). With respect to seven role types (household members including spouse, children and their partners, other kin, neighbours, contacts through work and school, members of voluntary organisations, and others), the respondents were asked to 'name the persons (*e.g.* in your neighbourhood) with whom you have frequent contact and who are important to you'. Only people above the age of 18 years could be included. The total number of named persons was taken as the size of the total network. For all identified relationships the frequency of contact was asked. Because of time constraints, the information on support was collected for only the 11 relationships (excepting with spouse) with the highest contact frequency.[3] For each of the (maximum) 11 network members, two questions were asked on the receipt of support. The question asked about instrumental support received was, 'How often in the past year did … help you with daily chores in and around the house, such as preparing meals, cleaning the house, transport, small repairs, or filling in forms?' The question on emotional support received was 'How often in the past year did you tell … about your personal experiences and feelings?' The answer categories were: 'never' (1), 'seldom', 'sometimes' and 'often' (4). For the present analyses, kin and non-kin relationships were distinguished. For support received by the respondent, we calculated the sum across the kin and non-kin relationships for each respondent and assigned a zero to respondents with no network members of that type. The aggregate scores ranged from 0 to 44.
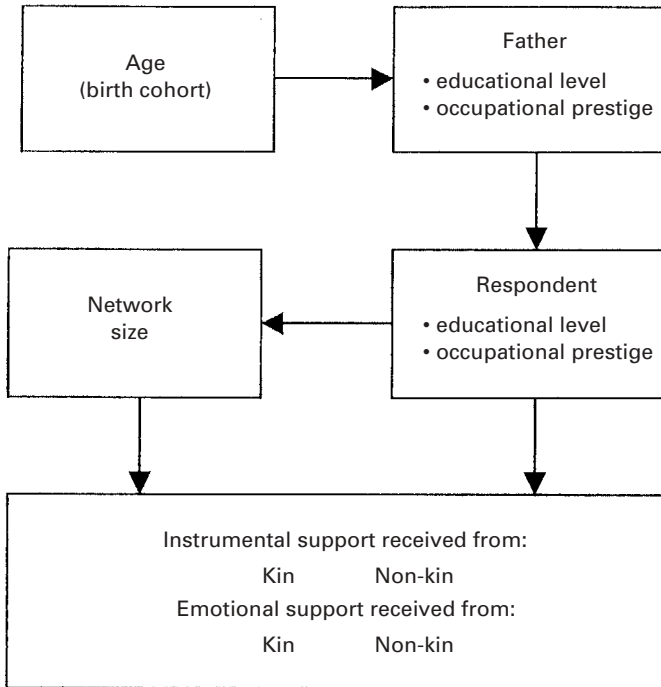
Figure 1. Model of linear structural regression of personal network characteristics on respondent's and father's socio-economic status.

Analyses

First, analysis of variance (ANOVA) was used to examine birth cohort and sex differences in the father's and respondent's levels of education and occupational prestige. In addition, cross-tabulations were used to examine the distribution of men and women in various birth cohorts over the four sub-groups of lifetime SES. Further ANOVA tests examined the age- and sex-adjusted differences between the four sub-groups in mean network size and in instrumental and emotional support from kin and non-kin. All these descriptive analyses were conducted separately for educational level and occupational prestige. Third, a linear structural regression equation was developed with a causal direction that father's SES preceded respondent's SES, and the latter preceded the network characteristics. Educational level and occupational prestige were both included in these multivariate analyses to examine their relative impact on network features. The four support scores included the number of (supportive) kin and non-kin relationships and were dependent on the network size. Age, indicating the birth cohort, was treated as an independent variable (Figure 1). Gender

T A B L E 1. *Lifetime socio-economic status by birth year and sex*

	Birth years					
	1903–1917		1918–1927		1928–1937	
	Men	Women	Men	Women	Men	Women
Educational Level (1–9)						
Father (Mean)	2.5	2.5	2.6	2.5	2.8	2.8
Respondent (Mean)	3.8	3.7	3.9	3.9	4.6	4.3
Father–Respondent (%)						
Low-Low	32	36	21	29	8	15
High-Low	2	3	2	2	3	1
Low-High	43	39	50	42	51	51
High-High	23	22	28	27	38	33
	$\chi^2_{(3)} = 1.6$		$\chi^2_{(3)} = 8.4^*$		$\chi^2_{(3)} = 11.5^{**}$	
Occupational Prestige (13–82)						
Father (Mean)	36.5	35.4	36.4	36.2	35.1	36.2
Respondent (Mean)	44.3	42.8	42.5	42.0	45.7	43.2
Father–Respondent (%)						
Low-Low	15	13	13	15	10	13
High-Low	7	12	11	16	6	14
Low-High	22	21	23	22	28	26
High-High	55	54	54	47	55	48
	$\chi^2_{(3)} = 5.8$		$\chi^2_{(3)} = 6.2$		$\chi^2_{(3)} = 15.5^{**}$	
Sample sizes	558	193	417	307	403	407

Significance levels: * $p < 0.05$; ** $p < 0.01$.

differences were examined by the multigroup method of analysis in the LISREL programme (Jöreskog and Sörbom 1993). This tests whether the equality of coefficients among men and women should be rejected. Model fit was evaluated by the significance of the chi-squared statistic and was improved in several steps by adding parameters to the model or by releasing the equality of coefficients across gender.

Results

Lifetime socio-economic status

The educational level and occupational prestige of the father and the respondent are described for men and women of different birth cohorts (Table 1). The youngest birth cohort had a higher educational level than the oldest birth cohorts ($F_{(2,2281)} = 23.8$, $p < 0.001$), and an equivalent difference was found for the father's educational level ($F_{(2,2281)} = 7.8$, $p < 0.001$). Gender differences in the mean level of respondent's and father's education were almost absent ($F_{(1,2281)} = 4.7$, $p < 0.05$ and $F_{(1,2281)} = 0.6$, $p > 0.05$, respectively). On average, the father's level was always lower than

the respondent's level. The proportions with low lifetime educational level were largest in the oldest birth cohorts (32% of the men and 36% of the women) and smallest in the youngest cohorts (8% of the men and 15% of the women). In all age groups there were relatively large proportions (39% to 52%) with upward socio-economic mobility (as measured by the educational level). Only a few respondents experienced downward mobility. The proportion of persons with lifetime high SES ranged from about one-quarter in the oldest age-group, to about one-third in the youngest. With the exception of the oldest age-group, women were more likely than men to have had low lifetime SES and were less likely to have experienced upward mobility. These findings clearly reflect restricted educational opportunities in the first half of the last century. From Table 1 we can see that such educational limitations have been greater for women than for men, despite the fact that we used household SES and limited our sample to married persons. The respondents' occupational prestige scores were lowest for those born during 1918–1927, followed by the oldest cohort and highest for the youngest cohort ($F_{(2,2281)} = 4.8$, $p < 0.01$). Women had lower status than males ($F_{(1,2281)} = 6.0$, $p < 0.05$). No significant differences in father's status by birth cohort ($F_{(2,2281)} = 0.6$, $p > 0.05$) or gender ($F_{(1,2281)} = 0.0$, $p > 0.05$) were observed. The majority of the older adults had an occupational status similar to their fathers. Reflecting the findings for the educational level, only a small minority of the respondents had lifetime low occupational prestige, but a larger proportion had experienced downward mobility and a lower proportion upward mobility. Gender differences were once again not found in the oldest age group, and were most apparent in the youngest age group. A relatively large proportion of women had experienced downward mobility (14% *versus* 6% of the men), and a smaller proportion had high lifetime occupational prestige (48% *versus* 55% of the men).

Inequality in network characteristics

Table 2 shows that older persons with low lifetime SES had smaller networks, received more instrumental support from kin, and less instrumental and emotional support from non-kin, compared with those who were upwardly mobile or had high lifetime SES. No differences were found regarding the receipt of emotional support from kin. A series of *a priori* contrasts (not shown here) revealed that there were significant differences between, on the one hand, those with low lifetime SES and, on the other, those with upward mobility and high lifetime SES. The few persons with downward mobility had even smaller networks and received less support from kin than those with low lifetime SES, but the differences

T A B L E 2. *Age- and sex-adjusted means of network features in four combinations of childhood and adulthood SES*

Network feature	Childhood-adulthood status combinations				$F_{(3,2279)}$
	Low-Low	High-Low	Low-High	High-High	
Educational level (N)	517	46	1069	653	
Network size	14.0	12.4	15.0	16.1	5.8*
Instrumental support from kin	10.9	10.2	9.7	8.9	9.0**
Instrumental support from non-kin	3.7	2.8	4.6	5.7	21.6**
Emotional support from kin	15.0	14.9	14.9	14.3	0.9
Emotional support from non-kin	5.9	4.8	7.7	10.0	33.2**
Occupational prestige (N)	304	235	548	1198	
Network size	14.0	13.7	15.0	15.6	4.0*
Instrumental support from kin	10.9	10.5	9.4	9.5	5.4*
Instrumental support from non-kin	3.9	3.9	4.8	5.0	7.3**
Emotional support from kin	15.3	15.3	14.0	14.9	2.3
Emotional support from non-kin	6.0	6.3	7.9	8.7	14.9**

Significance levels: * $p<0.001$; ** $p<0.0001$.

between these two groups were not statistically significant. All these SES differentials were replicated for both educational level and occupational prestige.

Associations between childhood SES, adulthood SES and age

The correlations that served as input for the LISREL analysis are presented in Table 3.[4] The first part of the model tests the associations between age, father's educational level and occupational prestige and respondent's educational level and occupational prestige (Figure 1). The regression coefficients of the associations between both SES-indicators and age in the final LISREL model are shown in Table 4. Most of the hypothesised effects were found in the data as indicated by a good fit of the model ($\chi^2_{(55)} = 68.3$, $p = 0.11$). The equality of coefficients among men and women was rejected only for one parameter: among women a correlated error between respondent's and father's occupational prestige was added to the model, indicating that there was a latent unknown factor related to both variables. Consequently, all regression coefficients were estimated as equal for men and women. Both respondent's and father's prestige depended on their educational level ($\beta = 0.58$ and 0.47, respectively). Furthermore, respondent's prestige depended on father's prestige ($\beta = 0.17$ for the direct effect in addition to an indirect effect of 0.09 from the respondent's education). Respondent's educational level depended on father's prestige ($\beta = 0.16$) and father's educational level ($\beta = 0.38$ for the direct effect and 0.08 for the indirect effect from father's prestige). Congruent with the results presented

TABLE 3. *Pearson correlation coefficients among variables used in the LISREL model*

Variable		Variable number (label in second column)									
No.	Label	1	2	3	4	5	6	7	8	9	10
Males (*N*=1378)											
1	Age	1.00									
2	Father's educational level	−0.08*	1.00								
3	Father's occupational prestige	0.03	0.45**	1.00							
4	Respondent's educational level	−0.14**	0.43**	0.32**	1.00						
5	Respondent's occupational prestige	−0.01	0.35**	0.36**	0.61**	1.00					
6	Network size	−0.18**	0.08*	0.06	0.16**	0.12**	1.00				
7	Instrumental support received from kin	0.00	−0.11**	−0.07*	−0.15**	−0.14**	0.18**	1.00			
8	Instrumental support received from non-kin	−0.15**	0.14**	0.08*	0.21**	0.16**	0.46**	−0.10**	1.00		
9	Emotional support received from kin	−0.09**	−0.07	−0.01	−0.03	−0.04	0.27**	0.69**	−0.14**	1.00	
10	Emotional support received from non-kin	−0.16**	0.22**	0.11**	0.26**	0.22**	0.50**	−0.18**	0.77**	−0.07*	1.00

Females ($N = 907$)

		1	2	3	4	5	6	7	8	9	10
1	Age	1.00									
2	Father's educational level	−0.08	1.00								
3	Father's occupational prestige	−0.02	0.49**	1.00							
4	Respondent's educational level	−0.10*	0.50**	0.37**	1.00						
5	Respondent's occupational prestige	0.00	0.37**	0.27**	0.63**	1.00					
6	Network size	−0.14**	0.06	0.03	0.07	0.10*	1.00				
7	Instrumental support received from kin	−0.04	−0.07	−0.04	−0.13**	−0.10*	0.28**	1.00			
8	Instrumental support received from non-kin	−0.11**	0.12**	0.09*	0.21**	0.16**	0.39**	−0.14**	1.00		
9	Emotional support received from kin	−0.17**	0.03	−0.01	−0.01	0.00	0.33**	0.66**	−0.19**	1.00	
10	Emotional support received from non-kin	−0.17**	0.17**	0.13**	0.27**	0.21**	0.41**	−0.22**	0.76**	−0.11*	1.00

Significance levels: * $p < 0.01$; ** $p < 0.001$.

T A B L E 4. *Standardised regression coefficients of the associations between SES and age*

	Father		Respondent	
Variable	Educational level	Occupational prestige	Educational level	Occupational prestige
Respondent's educational level				0.58***
Father's occupational prestige			0.16***	0.17***
Father's educational level		0.47***	0.38***	
Age	−0.08***	0.04*	−0.09***	0.06***

Note: Coefficients are equal for men and women. Among women, a correlated error of −0.11 between respondent's and fathers occupational prestige was added to the model.
Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

T A B L E 5. *Standardised regression coefficients of the associations between personal network characteristics and SES and age*

		Instrumental support received from		Emotional support received from	
Network characteristic	Network size	Kin	Non-kin	Kin	Non-kin
Respondent's occupational prestige	0.07***	−0.06**	0.03	−0.01	0.04
Respondent's educational level	0.06***	−0.07***	0.14***	0.00	0.13***
Father's occupational prestige					
Father's educational level					0.06***
Age	−0.16***			−0.10***	

Note: Coefficients are equal for men and women. Associations among personal network characteristics are not shown.
Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

above, the educational level increased across successive birth cohorts. When controlled for educational level, however, occupational prestige decreased across successive birth cohorts.

Associations between childhood SES, adulthood SES and network features

Table 5 shows a positive but weak association between the SES indicators and network size ($\beta = 0.07$ for occupational prestige and $\beta = 0.06$ for educational level). Consistent with the bivariate associations reported in Table 2, the LISREL analysis showed that high SES respondents received less instrumental support from kin relationships ($\beta = -0.06$ for prestige and $\beta = -0.07$ for educational level), but more instrumental support from non-kin relationships ($\beta = 0.14$ for educational level). Regarding emotional

support, the results confirm the expected positive association between SES and emotional support from non-kin ($\beta = 0.13$ for educational level), but do not reveal the expected association between SES and emotional support from kin. The associations with network characteristics were stronger for the respondent's SES than for the father's SES. There were no interaction effects with respondent's or father's educational level or occupational prestige (analysis not shown). To improve the model's fit, however, the direct effect of father's educational level on emotional support received from non-kin relationships ($\beta = 0.06$) was added. It should be noted that the effects of educational level and occupational level were comparable, except upon support from non-kin relationships. In addition the direct effects of age on network size ($\beta = -0.16$) and on emotional support received from kin relationships ($\beta = -0.10$) were added. There was no interaction effect of age on the association between SES and network size and support. Despite a relatively high level of SES among the younger birth cohorts, there was no difference between the young and the old in the associations of SES with network characteristics. Age had a direct effect on educational level, occupational prestige, network size and emotional support from kin.

Discussion

The first objective of this study was to describe socio-economic status differences in the personal networks of older adults. In accordance with other studies (Antonucci 2001; Moore 1990), our results find that those with lower status have smaller networks than those of higher-status persons, and that they rely more on kin than non-kin relationships. Moreover, our study provides further information about the association between SES and support associations in later life (Antonucci, Ajrouch and Janevic 2003; Krause and Borawski-Clark 1995): there is a positive association between SES and support (both instrumental and emotional) from non-kin relationships, a negative association between SES and instrumental support from kin, and no significant association between SES and emotional support from kin. The inequality in network size and support from non-kin relationships corroborates the idea that high-status individuals have larger opportunities as well as personal capacities to develop and utilise 'weak ties' with non-kin. The inequality in instrumental support from kin reflects either the cultural preferences for kin of the lower educated or the greater financial means of the relatively highly educated – who can buy instrumental support from other sources (Merrill 1997). The lack of inequality in emotional support in kin relationships reveals that both

low- and high-status individuals have close emotional bonds with their children, siblings and other kin.

The rather weak association between SES and both network size and support suggests that these social conditions play only a modest role in the explanation of SES differences in health (*cf.* Matthews, Stansfield and Power 1999). Our results, however, underscore the differences in types of support from kin and non-kin relationships when SES is involved. The influence of socio-economic status through social pathways on inequalities in health and wellbeing may be greater when support from non-kin and kin is considered separately than when support from the aggregate network is examined. It is possible that kin and non-kin relationships affect health and wellbeing differently in lower and higher status groups. Status differences may be present, for example, in the feelings of embeddedness provided by non-kin relationships, or in the provision of material resources and goods by kin (Kawachi and Berkman 2000). Further research on the social pathways of socio-economic inequality in health and wellbeing should distinguish between different types of support in different types of relationship.

The second objective of the study was to examine the relative impact of childhood and adulthood SES on network size and support. The results clearly show that adulthood SES is more important than childhood SES for all the network features under study. The rather weak associations between father's and respondent's SES (total effects of 0.46 for educational level and 0.26 for occupational prestige) illustrate that both downward and upward mobility are present. As shown in Table 1, the majority of the respondents were better educated and reached a higher occupational level than their parents, and the effect was strongest in the younger birth cohorts. These results reflect changes in western societies during the 20th century, when through modernisation, technological developments and individualisation, class boundaries became less strict and opportunities for socio-economic mobility increased. The absence of interaction effects indicated that the impact of childhood and adulthood SES was additive (Table 2). In other words, respondents with a low childhood and low adulthood status had smaller networks compared with respondents who had low childhood status but higher adulthood status. The upward mobility of the majority of the respondents may reflect the accompanying change in opportunities and preferences for social relations, and have resulted in larger networks and more support from non-kin relationships. Those with downward mobility (high childhood and low adulthood status) had network features that are comparable to people with low lifetime SES, which corroborates the finding that adult SES is more influential than childhood SES.

The third objective was to examine the different results regarding educational level and occupational prestige. The bivariate analyses revealed that educational level and occupational prestige differentiated network features to the same degree (Table 2). Nonetheless the LISREL analysis showed that occupational prestige was largely dependent on educational level, and that occupational differences in network features were weakened when educational level was also taken into account. It can be concluded from these findings that educational level is a more important indicator of network differences in late life. These results support the notion that educational level and occupational level tap different aspects of socio-economic status (Grundy and Holt 2001; Lynch and Kaplan 2000). As education is the knowledge component of SES, while occupational prestige is the social-cultural element, our results show that the former has had most influence on the development and maintenance of personal networks.

Our results inform the debate about which measures are valid and sensitive indicators of lifetime SES. We found that the associations between childhood SES and adulthood SES were stronger for educational level than for occupational level. This is partly because downward mobility was more prevalent for occupational prestige than for educational level. These findings reflect the changed occupational careers of families, and that occupations are more sensitive to external influences such as economic hardships and restrictive labour markets. Marriage and family formation have hampered the professional careers of women and forced many to leave the labour market permanently or to re-enter at a lower occupational level. This lifetime instability in occupational level may explain the smaller differentials in health or networks in later life, but it also hinders the understanding of these occupational differences. Additional information on inter- and intra-generational occupational mobility and accompanying changes in work and family conditions may further our understanding of the impact of occupational level on networks in later life. For now, we conclude that educational level is a better measure of the lifetime SES of older adults than occupational prestige.

The present study has focused on socio-economic history as a factor for differences in late-life network features. The findings indicate that living in a low socio-economic status during one's entire life increases the risk in late life of social isolation and consequently for poor health and wellbeing. Other mechanisms may however provide additional and alternative explanations of *the reasons for* SES inequalities in network features. Other studies have evinced a psychological pathway: SES differences are found in self-esteem, extraversion and self-efficacy (Cattell 2001), and these personality characteristics are related to network size and support (Lang,

Staudinger and Carstensen 1998). SES differences also exist in environmental conditions, as in neighbourhood quality (Krause 1993) and the geographic proximity of kin relationships (Greenwell and Bengtson 1997; Thomése and Van Tilburg 2000), which may also affect the constellation of the personal network. Future research will have to examine to what degree SES inequalities in networks are explained by SES differences in personal, cultural and environmental resources.

Socio-demographic projections indicate a large increase in health problems and the use of care facilities in the coming decades as a result of the ageing of the population. On the other hand, the future generations of older adults will have a higher level of education than the current older population, and this will significantly diminish the predicted effects of ageing on health problems and use of care (Joung *et al.* 2000). The findings reported here suggest that, given their rising educational level, the risks for social isolation will be diminished for a large proportion of the older population. Still, the dominance of kin relationships in the network of low status adults requires attention. As a consequence of demographic change, with the increase of single older adults and the decreased number of children per family, kin become less available or willing to provide support to their older relatives (Bengtson, Rosenthal and Burton 1990). These trends most affect low-status older adults, since they rely more on their kin for instrumental support and are less able to expand their network with non-kin relationships. Despite the optimistic picture of future generations of more educated and socially-embedded older people, therefore, those with a (lifelong) low socio-economic status should remain the centre of policymakers' and practitioners' attention.

Acknowledgements

NOTES

1 The selected municipalities were one city and four rural districts in the east, one city and two rural areas in the south, and Amsterdam and two rural areas in the west. These three regions can be taken to represent differences in religion and urbanisation in the Netherlands.

2 There was an almost equal proportion of excluded men (11%) and women (9%; $\chi^2_{(1)} = 4.4$; $p < 0.05$). Excluded respondents were older (M = 74.7 years; s.d. = 10.1)

than the respondents (M=69.2 years; s.d.=9.2; $t_{(2,541)}$=9.0; p<0.001). To check whether the exclusion of non-married persons distorted our findings on the SES–network associations, Pearson correlation coefficients were calculated separately for the married and non-married samples (not shown). The direction and the magnitude of the SES–network associations were comparable, so it was concluded that the selection of married persons did not affect the results for SES differentials in network features.

3 It should be noted that this selection procedure is not equal for all respondents. For those with a small network, all members are included in the questions, whereas for those with a large network the selection will include for example relationships with only daily contact. As frequent contact is more likely to exist with children and neighbours, these types of relationships may dominate the support networks of persons with large networks. To correct for this bias, network size is included in the analyses on support.

4 For introductions to LISREL analysis see Long 1983 *a*, 1983 *b*.

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