The effect of retirement on social relationships: new evidence from SHARE data.

(Preliminary version. Please do not quote)

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Abstract

We analyze the causal effect of retirement on social relationships - in terms of size, composition and intensity - using the 4th and 6th waves of SHARE data for 11 European countries. Our empirical strategy exploits the different retirement eligibility ages as instruments for the endogenous individuals' retirement decisions. We show evidence that retirement has a positive effect on the share of family members in the network – but not in terms of absolute size of the network-, while the effect is negative on colleagues and friends. Changes in the composition are associated with stronger relationships, especially for family members. We interpret the above findings as indication of an ongoing substitution between weak (friends or colleagues) and strong ties (family), along with an increase in the intensity of the surviving ties.

Keywords: retirement, social relationships

JEL Classification: J26; I10; C26

1. Introduction

Over the life-cycle individuals rely on each other to perform a large number of social activities, whether it be interactions with colleagues at the workplace, spending leisure time with friends and other acquaintances, or exchanging information, affection and help with family members. These social relationships typically evolve with the aging process in terms of size, composition and intensity of the relationship. Early studies of social relationship and ageing found that older adults typically have smaller networks (Cumming and Henry 1961), partly because in late life people are more likely to be widowed or have friends who had already died, and partly because they are more likely to live alone (Hobbs and Stoop 2002). While smaller social network place older adults at risk of isolation, social exclusion and dissatisfaction with their social lives (Van Tilburg 1995), there is evidence that the social interactions that are maintained throughout older age are rated as more satisfying and emotionally fulfilling (Lansford, Sherman and Antonucci 1998). Older adults also report experiencing more positive emotions when interacting with their social partners as compared to younger adults (Charles and Piazza 2007), and perceptions of social support are increasing with age (Field and Minkler 1988; Schnittker 2007). The above patterns are also consistent with the extensive findings from the literature on happiness showing a U-shaped relationship in age for self-reported satisfaction (Clark et al. 1996; Charles and Piazza 2007), with older adults reporting better quality ties with their children, more positive marriages, closer friendships, and an overall greater proportion of positive versus problem-ridden relationships as compared to middle-aged adults (Fingerman, Hay, and Birditt 2004; Rook 2003). Social networks also bear important implications over the ageing process for several other reasons ranging from individuals' socio-economic stability to their health and well-being (Pinquart and Sorensen, 2000). Larger social networks are associated with better employment prospects and lower inequality (Calvo-Armengol and Jackson 2004), they exhibit better health conditions (House et al. 1988), enhanced utilization of health and social services (Bowling, Farquhar and Browne 1991; Litwin 2004) and greater longevity (Brown, Consedine, and Magai 2005). Moreover, older individuals characterized by larger social network and a more active social life are found to have a better knowledge of healthy behaviors, are more likely to take preventive measures and better endowed to self-manage chronic diseases (Ellwardt et al., 2013). Most of the above studies characterize the association between social network and ageing as a gradual process that unfolds over time as individuals get older. What has received less attention is whether sudden changes in the economic status of individuals over

the life course, such as it happens with retirement decisions, have any effect on social networks and what are the implications for individuals' well-being. Despite the fact that the age of retirement is a fairly predictable event, many empirical studies have reported significant shifts around the age of retirement in consumption patterns, lifestyles, as well as in the health status of individuals (Banks et al. 1998, Coe and Zamarro 2011). In this context, also the size and the composition of social relationship are expected to change when individuals retire: for example, the opportunity to meet new people at work and interact with colleagues diminishes, while the amount of time to create new relationships outside work and strengthen the already existing ones rises. Among the few studies that have investigated the association between retirement and social network results are mixed. Fletcher (2014) used SHARE data for European countries and found no evidence of changes in social network due to retirement, while Börsch-Supan and Schuth (2016), using the same data, found a reduction in the size of the networks associated with the exit from the labour market that contributed to a reduction in cognitive health. Finally, using data for the US, Patacchini and Engelhardt (2016) found that retirement significantly reduces the size of the networks for women and the more educated.

In this paper we provide new evidence on the relationship between retirement and social network size and composition. We contribute to the existing literature in a number of ways. First, we address the endogeneity of retirement decisions providing evidence on the causal effect of retirement on various patterns of social relationship. Since retirement decisions are likely to depend on individual characteristics (partly unobservable) and on time-varying shocks (i.e., affecting the decision to retire early), we use a fixed-effect IV model. In particular, we focus on EU countries and exploit the panel dimension of Survey of Health, Ageing, and Retirement in Europe (SHARE) with information on labor market status, network characteristics and a wide range of socioeconomic and demographic characteristics. The empirical strategy exploits the different retirement eligibility ages (early and ordinary retirement ages) to instrument individuals' retirement decisions (Coe & Zamarro, 2011). Second, we investigate different dimensions of social relationship, such as its size (i.e. number of individuals in the network), composition (i.e. family members, friends, or colleagues) and intensity of the relationship (i.e. frequency and closeness). Third, we specify the effect of retirement both with a retirement dummy, and the number of years spent in retirement to account for the fact that social relationships may take time to adjust. Fourth, we investigate several heterogeneous effects of retirement by gender, education and different patterns of working time and pro-social behavior (i.e., individuals doing voluntary work).

Our results suggest that retirement has a positive effect on the share of family members in the network – but not in terms of absolute size of the network-, while the effect is negative on colleagues and friends. Changes in the composition are associated with stronger relationships, more frequent contacts and a higher closeness, which increases especially for family members. Although most of the above effect are the results of short-run adjustments which occur around retirement, we also find evidence that some adjustment takes place gradually with the number of years in retirement namely in terms of lower daily overall and family contacts, and higher closeness within the family. We find little evidence of heterogeneous effect by gender, education or pro-social behaviors. The above results are shown to be robust to a number of specification changes and estimation methods. Overall, our findings suggest that most of the changes occurring in social relations at retirement can be explained in terms of substitution between weak (friends or colleagues) and strong ties (family), along with an increase in the intensity of the surviving ties.

The paper is structured as follows. Data and some descriptive statistics are described in Section 2. Section 3 presents our empirical strategy. Section 4 presents our results, while concluding remarks are provided in Section 5.

2. Data and descriptive statistics

We use data from Release 4 of the fourth and sixth waves (2011 and 2015) of the Survey of Health, Ageing and Retirement in Europe (SHARE), a multidisciplinary and cross-national bi-annual household panel survey coordinated by the Munich Center for the Economics of Aging (MEA) with the technical support of CentERdata at Tilburg University. The survey collects detailed information on socio-economic status, health, social and family networks for nationally representative samples of elderly people in the participating countries. SHARE is designed to be cross-nationally comparable and is harmonized with the U.S. Health and Retirement Study (HRS) and the English Longitudinal Study of Ageing (ELSA). The baseline (2004) survey covers 11 countries, representing different regions of continental Europe, from Scandinavia (Denmark, Sweden) through Central Europe (Austria, Belgium, France, Germany, the Netherlands, Switzerland) to Mediterranean countries (Greece, Italy, Spain), it was subsequently extended to include EU27 countries in 2015. The target population consists of individuals aged 50+ who speak the official language of each country and do not live abroad or in an institution, plus their spouses or partners irrespective of their age. The countries that we

include in the analyses are: France, Germany, Austria, Belgium, Denmark, Netherlands, Spain, Sweden, Switzerland, Italy, Czeck Republic, Estonia, Slovenia, Poland and Portugal. Our working sample consists of people aged 50 to 70 at the time of their first interview, who classified themselves as employed, unemployed or retired, and participated to both wave 4 and 6 of SHARE. These selection criteria, result in a balanced panel of 18,727 individuals, each interviewed twice.

In wave 4 and 6 SHARE gathered information about egocentric social networks for each individual. Each respondent (the "ego") was asked to name members (the "alters") of his/her social network, using the following script:

"*Now I am going to ask some questions about your relationships with other people. Most people discuss with others the good or bad things that happen to them, problems they are having, or important concerns they may have. Looking back over the last 12 months, who are the people with whom you most often discussed important things? These people may include your family members, friends, neighbors, or other acquaintances. Please refer to these people by their first names.*"

Few information about "the alters" are gathered, mainly the type of relationships with the ego, their gender and age. Survey participants were permitted to list up to seven name and reported information about the satisfaction of the relationships[1], the strength of the relationships (closeness)[2] and the frequency of the contact[3]. These data are known as egocentric social network data and more specifically, they can be defined as "discussion" networks. Using these variables, we characterize the networks' structure and intensity. To gauge changes in the composition of the network we use the size (*snsize*)[4], percentage of family members (*percfam*), percentage of friends (*percfriend*) and percentage of colleague (*perccol*). We then define "closeness" (*strenght*) as the average strength of the ego-alter ties divided by network size to make the range of this index 0 to 1. We compute the percentage of alters the ego has a very close relationship with (*percveryclose*), the average closeness with alters belonging to the ego's family (*family_clo*s) and the average closeness with friends (*friend_clos*). We use the information about the frequency of the contact with the alter to compute the percentage of alters (*percdaily*), the number of family members (*fam_daily*) and the number of friends

[1] From 0 to 10.
[2] From 1 "not very close" to 4 "extremely close"
[3] From 1 "never" to 7" daily"
[4]The size of the social network is usually called *degree*.

(*friend_daily*) interacting daily with the ego. Finally, we computed the frequency of contacts with the most contacted alter within the network (*most_con*) and used the information about satisfaction (*snsatis*) and a dummy equal to 1 if the ego is very satisfied (*very_satis*).

In order to explore how different individuals deal with the transition from work to retirement, we consider their gender and whether they have a tertiary educational level. Other behaviors can affect the changes in network associated with retirement, and we focus in particular on pro-social attitude and active social life. In SHARE, a range of activities done during the year before the interview are documented and we use this information to define a dummy variable, *voluntaryjob,* based on how individual answered in wave 4. This variable takes the value one if the individual has done voluntary jobs or charity, and can be used to proxy pro-social behavior.

Panel A of Table 1 shows the average size and composition of the networks. The size is rather small on average and slightly higher in the second wave. These egocentrics networks are mainly composed by family members, very few friends, colleagues and others. In Panel B we report some sample means. In our operative sample, about 54 percent of the individuals are female, the average age is 60 but it rises to 64 years later. About one out of four has a tertiary degree and 18 percent have done a voluntary job during the year before wave 4. Finally, 48 percent of the sample is already retired in wave 4, while this percentage rises to 61 percent four years later.

TABLE 1 ABOUT HERE

3. Empirical Strategy

The empirical strategy exploits the panel dimension of SHARE, which has the important advantage of allowing us to control for time-invariant characteristics of the respondents, such as gender, birth cohort, and educational attainment.

Our baseline specification estimates the association between the characteristics of social relationships and retirement, as follows:

$$SR_{it} = \alpha_i + \beta Retired_{it} + \delta X_{it} + \varepsilon_{it} \quad (1)$$

where SR_{it} is an indicator for social network characteristics, such as size, closeness and frequency of contact (as described in the previous section) for individual *i* in wave *t*, $Retired_{it}$

is a binary indicator for retirement, while X_{it} contains a function of our running variable, age_{it} which is the age of the individual at the time of the interview. Finally ε_{it} is the idiosyncratic error term, which is potentially correlated with $Retired_{it}$.

It is widely recognized that estimating equation (1) by OLS would be biased by the correlation between retirement choices and unobservable time invariant and time variant factors, or by reverse causality because for example those individuals that retire earlier might be those with poorer health. Fixed effect estimation would solve the problem of unobserved heterogeneity due to individual time invariant characteristics. In this case, to identify the effect of retirement on social relationships we would need enough individuals switching from employment to retirement between the two waves.

Fixed effect estimations are not sufficient to identify a causal effect of retirement on social relationships, because time varying individual unobservables or reverse causality may still bias our estimates, such as for example an health shock that hits the respondent between waves causing retirement. We take advantage of the panel dimension of SHARE and address this problem using a FE instrumental variable strategy. Our instruments are based on the legislated early and normal ages of eligibility for a public old-age pension (EligE and EligN), two variables that are arguably exogenous and easily shown to be relevant for the actual retirement age. We define these two variables as two dummies, equal to one if the individual age is higher than the statutory age for early retirement and the mandated age for normal retirement at the time of the interview. In doing so, we are using variations between countries and in time within the same country of eligibility to retire as an exogenous shift. We run some sensitivity analysis around the threshold, both in term of the specification of the running variable and in term of the bandwidth (TBD). It turns out that the best specification includes a country-specific linear trend in age, and our results are not sensitive to changes in the bandwidth, thus throughout the paper we use stick to the 50-70 sample and include country-specific linear trends in age.

We test also for the presence of asymmetry and, following Mazzonna and Peracchi (2015), we estimate a more flexible specification that allows us to disentangle the jump at the threshold from a change in the slope of the outcomes using this model:

$$SR_{it} = \alpha_i + \beta Retired_{it} + \gamma DistR_{it} + \delta X_{it} + \varepsilon_{it} \qquad (2)$$

where the variables are defined as in equation (1), but we add the term $DistR_{it}$ which is the number of years spent in retirement (equal to zero if the individual has not retired yet at wave *t*). We use the same estimation methodology and based on our eligibility data, we construct four

instruments: two binary indicators of eligibility, respectively for early and normal retirement (EligE and EligN) as before, and two variables that measure the distance of the respondent's age at the time of the SHARE interview from the eligibility ages for early and normal retirement (DistE and DistN). By analogy with DistR, the last two instruments are constructed as the positive part of the difference between the actual age of individual *i* at time *t* and the eligibility ages for early and normal retirement that are relevant for individual *i*.

Lastly, we explore some heterogeneity in the effect of retirement by gender splitting the sample, but also explore the presence of different effects of retirement by educational level and by proxies for pro-social behavior. In this case, we estimate a fully interacted model, in which we interact with the treatment variable and the instruments, our time invariant variables.

4. Results

In this section we report the results from our fixed effects IV estimation of the effect of retirement on several indicators of social relationships using the identification strategy presented in the previous section.

4.1 Main results

Table 2 shows the results from the first-stage regression of our endogenous variable (Retired) on the exogenous regressors and the excluded instruments. As discussed in the previous Section, we use two instruments: two binary indicators of eligibility for early and normal retirement (EligE and EligN). A first model includes a linear age term (column 1), next we experiment with a specification with an additional quadratic age term (column 2) and finally we allow the linear age term to differ across countries (column 3). This last specification add to the regressors a set of interactions between the linear age term and the country indicators. The Table also shows number of observations, the regression R-squared and the F-statistics for the joint significance of the excluded instruments.

TABLE 2 ABOUT HERE

Results confirm that eligibility rules are important determinants of retirement decisions: all instruments are strong predictors of our endogenous variable, showing positive and statistically significant coefficients. In particular, we notice that our estimates are unaffected by the introduction of a quadratic age term (column 2) or a country-specific linear trend in age (column 3).

TABLE 3 ABOUT HERE

Table 3 shows the estimated coefficients on being retired for our set of indicators of social relationships for the model shown in equation (1). Retirement has a positive effect on the percentage of family members in the network, while has a negative effect on the composition of the network in terms of colleagues and friends, even though not statistically significant for the latter. However, no effect is found in terms of the size of the network. Our findings would suggest a short run effect of retirement that results into a substitution between weak and strong ties (family vs. colleagues or friends in general see Granovetter, 1973[5]). Role-guided relationships, such as those with colleagues, can be important and affectionate, but they are primarily tied to the role setting, which might limit them in terms of duration and strenght (Van Tilburg, 2013). One possible explanation could be that, once retired they disengage from peripheral relationships, because emotional engagement with core network relationships might be more rewarding. Results are robust to the inclusion of age and age squared (columns 5 to 8) and country specific age trends (columns 9 to 12). From now onwards our preferred specification will be the one including country specific age trends.

TABLE 4 ABOUT HERE

In Table 4 we present results for a set of outcomes measuring the strength, the closeness and frequency of contacts in the network. We find that changes in the composition due to retirement are also associated with a higher overall strength of the relationships in the network (*strength*'s coefficient is positive and statistically significant). Moreover we find an increase in the percentage of alters the ego has a very close relationship with (*percveryclose*). Closeness increases especially with respect to family member of the ego's network (*family_clos* bear a positive and highly statistically significant coefficient).

In terms of frequency of contacts we find that daily overall contacts increase, being *percdaily* positive and statistically significant. In addition, the frequency of contacts with the most contacted alter within the network increases substantially (*most_con*). Finally, no effect is found in terms of satisfaction with the network.

TABLE 5 ABOUT HERE

In Table 5 we present our estimates including a term for number of years spent in retirement also (DistR) and estimate a model as defined in equation (2). Results with respect to the

[5]

immediate short run effect measured by the dummy for being retired are not affected by the inclusion of the additional variable measuring years spent in retirement. We find a negative and statistically significant effect for DistR only in the case of daily overall and family contacts, and a positive and statistically significant coefficient with respect to family closeness. Overall, results seem to suggest that short run effects in terms of retirement decisions do affect social network outcomes, while long run effects are less clear-cut.

4.2 Heterogeneity

Our next step is to investigate whether the evidence found in the Tables 3 to Table 5 is homogeneous by gender (Table 6a and Table 6b, for female and male respectively), by education (Table 7) and by prosocial behavior (Table 8).

Social relationship is an important aspect of ageing for both men and women. The gender differences in social network's characteristics observed in younger adults, with women reporting larger social networks than men, may diminish with increasing age (Ajrouch, Blandon, & Antonucci, 2005). Continuity of social roles and routines generally influence the behavior of men in late life who are more likely to maintain schedules characteristic of earlier life stages (Barer, 1994), making it less likely that differences in network size, proximity, and contact frequency will occur as compared to women. Table 6a shows the estimated coefficients on Retired for our set of indicators for social relationships for females, while Table 6b for males. No substantial difference can be found with respect to gender as compared to our baseline analyses. Estimates for the female sample (Table 6a) show somehow less precise estimates as compared to male (Table 6b), the only differences being females more satisfied with their network of contacts, while only for males there is a decrease in the percentage of colleagues in their network. Our results seem to support the evidence suggesting that gender differences in social interactions disappear in late adulthood (de Jong et al., 2009; Gurung et al., 2003).

TABLE 6 ABOUT HERE

Network studies extensively documented that more educated people have an advantage in social ties with respect to less educated. In fact, the better educated are more likely than the less educated to retain or initiate a network tie (Kohli, Hank, & Künemund, 2009). The better educated tend also to have more supportive networks and a higher frequency of contact with important associates with respect to less educated people, a differences that increases also later

in life (Fisher et al, 2018). One possible explanation of this evidence is that having a tertiary degree implies having better social skills and probably more resources, useful means to sustains strong relationships with nonkin.

In our sample, we observe that, on average, more educated people tend to have larger networks (2.97 vs 2.48 in wave 4) with a lower percentage of kin (.68 vs .75) and higher closeness (.77 vs .75)[6]. In Table 7 we compare the effect of retirement according to the educational level of the ego. We find that the percentage of kin in the network increases of about 10 percentage points for both tertiary and non-tertiary educated egos. Conversely, we observe that retirement is associated with a statistically significant reduction in the percentage of friends for the more educated and a reduction in the percentage of colleagues for the less educated. These changes in the structure of the network are associated with an overall increase in contact frequency, closeness and satisfaction for the less educated, while we do not observe many changes for the more educated, with the exception of an increase in closeness towards kin. Our results seems to tentatively point in the direction of a decrease in the inequality is socialization through the life course between more educated people and less educated people.

TABLE 7 ABOUT HERE

Older persons' participation in pro-social activities have increased dramatically in the last decades, particularly among the young-old (Windsor, Anstey, & Rodgers, 2008; Wilson, 2000). Volunteering may represents an opportunity for older adults to engage their social networks. The literature proposes two potential pathways by which network changes are related to volunteerism: either through "bridging" or "bonding" (Paik & Navarre-Jackson, 2011). Change in composition, not size, holds the most potential to shape volunteer activity in later life. Findings hint at the significance of non-family intergenerational relationships for volunteerism in older adults' social networks, indicating that over time who is in one's network matters more than how many are in the network.

TABLE 8 ABOUT HERE

In Table 8 we compare the effect of retirement by volunteering activity, and we find that the percentage of family members in the network increases of about 9 percentage points for both those involved and not in pro-social activities. Interestingly, we observe that retirement is associated with a statistically significant increase in the satisfaction with the network only for

[6] These averages are statistically significantly different between the two groups.

those involved in pro social activities, also family daily contacts become more frequent in this case.

5. Discussion and conclusions

In this paper, we provide new evidence of a causal impact of retirement on social network size and composition. We show that retirement alters the composition of the network increasing the share of family members in the network, while decreasing that of colleagues, acquaintances and friends. No effects are detected in terms of network absolute size. The above changes in the composition are associated with stronger relationships, more frequent contacts and a higher closeness, especially for family members. Although most of the above effect are the results of short-run adjustments which occur at the time of retirement, we find evidence that along with the number of years spent in retirement there is a decrease in daily contacts while closeness within the family increases. Although our identification strategy does not allow us to disentangle the effect of the different mechanisms; we argue that most of the changes occurring in social relations at retirement can be explained in terms of substitution between weak (friends or colleagues) and strong ties (family), along with an increase in the intensity of the surviving ties. The implications of the above findings for policy initiatives are twofold. First, early retirement may trigger a reduction in individuals' social relations with the people outside the family negatively affecting availability of social support and social inclusion later in life. Second, the strong reliance on family ties after retirement may be taken as an indication of insufficient public support in the development of social relationship thus calling for a stronger engagement of public policies in community services and other measure targeted at promoting social relations and inclusion of individuals after retirement.

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Table 1: Network Characteristics for Individuals Ages 50-70. By wave.

	Wave 4	Wave 6
PANEL A		
Network structure		
Network Size (Number of Alters)	2.60 (1.62)	2.76 (1.60)
Percentage with no relationships	.034 (.18)	.024 (.15)
Percentage of Family relationships	.73 (.34)	.77 (.32)
N° of friends	.17 (.28)	.16 (.27)
Other network measures		
Average closeness (strength)	.76 (.22)	.80 (.19)
Network Satisfaction	8.88 (1.24)	8.94 (1.27)
Percentage of very satisfied	.39 (.49)	.44 (.49)
Percentage of alters contacted daily	.13 (.25)	.52 (.37)
Contact frequency of most contacted alter	5.75 (1.6)	6.58 (1.2)
Percentage of very close alters	.79 (.33)	.84 (.29)
Family closeness	3.00 (1.18)	3.17 (1.09)
N° of Family alters contacted daily	.26 (.58)	1.12 (.89)
Friends closeness	.94 (1.36)	.94 (1.38)
Friends contact frequency	.06 (29)	0.6 (.28)
PANEL B		
Retired	.48 (.49)	.61 (.48)
Age	60.7 (5.58)	64.7 (5.58)
Female	.54 (.49)	.54 (.49)
Tertiary education	.25 (.43)	.25 (.43)
Has done a voluntary job before Wave4	.18 (.38)	.18 (.38)
N° of observations	18727	18727

Note: Standard deviations in parenthesis

TABLE 2: First stage fixed effect estimates of the Impact of Social Security Eligibility on Retirement. Individuals aged 50-70.

VARIABLES	(1)	(2)	(3)
EligE	0.178***	0.172***	0.179***
	(0.0205)	(0.0205)	(0.0205)
EligN	0.142***	0.147***	0.140***
	(0.0205)	(0.0202)	(0.0202)
Observations	37,454	37,454	37,454
R-squared	0.855	0.855	0.855
Only age	YES	NO	NO
Age and age2	NO	YES	NO
Country specific age trends	NO	NO	YES
F-test	80.81	80.70	79.60

Clustered SE by age-country cluster in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 3: Estimates of the Impact of Retirement on Social Networks structure. Individuals aged 50-70.

VARIABLES	(1) snsize	(2) percfam	(3) Percfrien	(4) Perccol	(5) snsize	(6) percfam	(7) percfrien	(8) perccol	(9) snsize	(10) percfam	(11) percfrien	(12) perccol
Retired	0.137	0.0889***	-0.0249	-0.0210**	0.144	0.0884***	-0.0250	-0.0210**	0.0923	0.0961***	-0.0290	-0.0209**
	(0.157)	(0.0280)	(0.0230)	(0.0106)	(0.157)	(0.0279)	(0.0232)	(0.0107)	(0.143)	(0.0250)	(0.0222)	(0.0102)
Observations	37,454	37,454	37,454	37,454	37,454	37,454	37,454	37,454	37,454	37,454	37,454	37,454
R-squared	0.684	0.690	0.705	0.579	0.684	0.690	0.705	0.579	0.687	0.691	0.706	0.581
Only age	YES	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO
Age and age2	NO	NO	NO	NO	YES	YES	YES	YES	NO	NO	NO	NO
Country specific age trend	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES	YES	YES

Clustered SE by age-country cluster in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 4: Estimates of the Impact of Retirement on Social Networks intensity. Individuals aged 50-70.

VARIABLES	(1) strength	(2) percdaily	(3) verysat	(4) snsatis	(5) most_con	(6) percveryclose	(7) family_clos	(8) fam_daily	(9) friend_clos	(10) friend_daily
Retired	0.0527***	0.109**	0.0748	0.174	0.446**	0.0635**	0.285***	0.134	-0.0639	-0.0152
	(0.0187)	(0.0547)	(0.0479)	(0.119)	(0.189)	(0.0308)	(0.103)	(0.0897)	(0.118)	(0.0267)
Observations	37,454	37,454	37,454	35,666	28,832	37,454	37,130	37,454	37454	37454
R-squared	0.633	0.669	0.629	0.624	0.614	0.611	0.652	0.695	0.720	0.605
Country specific age trend	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Clustered SE by age-country cluster in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 5: Estimates of the Impact of Retirement and Distance from Retirement on Social Networks. Individuals aged 50-70.

VARIABLES	(1) snsize	(2) Percfam	(3) percfrien	(4) perccol	(5) percother	(6) strength	(7) percdaily	(8) verysat	(9) snsatis	(10) most_con	(11) percveryclose	(12) family_clos	(13) fam_daily	(14) friend_clos	(15) friend_daily
Retired	0.0878	0.0872***	-0.0213	-0.0181*	-0.0170	0.0482**	0.0856	0.0640	0.136	0.425**	0.0508*	0.274***	0.0685	-0.0489	-0.0136
	(0.140)	(0.0247)	(0.0219)	(0.0101)	(0.0123)	(0.0188)	(0.0553)	(0.0481)	(0.119)	(0.188)	(0.0302)	(0.102)	(0.0889)	(0.116)	(0.0260)
Dist	0.0131	-1.31e-05	0.00121	0.000195	9.07e-05	0.00158	-0.0131***	-0.000853	-0.00604	-0.00535	0.00211	0.0151**	-0.0488***	-0.00237	0.00199
	(0.0104)	(0.00211)	(0.00161)	(0.000694)	(0.000920)	(0.00137)	(0.00462)	(0.00333)	(0.00827)	(0.0144)	(0.00209)	(0.00743)	(0.00696)	(0.00807)	(0.00186)
Observations	37,454	37,454	37,454	37,454	37,454	37,454	37,454	37454	35,666	28,832	37,454	37,130	37,454	37,454	37,454
R-squared	0.686	0.692	0.706	0.581	0.576	0.633	0.669	0.629	0.624	0.614	0.612	0.651	0.689	0.720	0.605
Country specific age trend	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Clustered SE by age-country cluster in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 6a: Estimates of the Impact of Retirement on Social Networks characteristics. Female aged 50-70.

VARIABLES	(1) snsize	(2) percfam	(3) percfrien	(4) perccol	(5) percother	(6) percdaily	(7) Verysat	(8) snsatis	(9) most_con	(10) percveryclose	(11) family_clos	(12) fam_daily	(13) friend_clos	(14) friend_daily
Retired	-0.0741	0.100***	-0.0380	-0.0107	-0.0149	0.0136	0.118*	0.250	0.167	0.0365	0.289**	-0.0136	-0.0638	-0.0393
	(0.187)	(0.0325)	(0.0313)	(0.0122)	(0.0198)	(0.0514)	(0.0631)	(0.167)	(0.166)	(0.0380)	(0.127)	(0.135)	(0.188)	(0.0406)
Observations	20,248	20,248	20,248	20,248	20,248	20,248	20,468	19,502	17,112	20,248	20,072	20,468	20,398	20,468
R-squared	0.680	0.701	0.721	0.579	0.558	0.662	0.633	0.623	0.608	0.613	0.642	0.687	0.727	0.622
Country specific age trend	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Clustered SE by age-country cluster in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 6b: Estimates of the Impact of Retirement on Social Networks characteristics. Male aged 50-70.

VARIABLES	(1) snsize	(2) percfam	(3) percfrien	(4) perccol	(5) percother	(6) percdaily	(7) verysat	(8) snsatis	(9) most_con	(10) percveryclose	(11) family_clos	(12) fam_daily	(13) friend_clos	(14) friend_daily
Retired	0.175	0.0779**	-0.0119	-0.029*	-0.0164	0.0569	0.0332	0.0923	0.454*	0.0755*	0.261	0.123	-0.0256	-0.00798
	(0.220)	(0.0371)	(0.0330)	(0.0166)	(0.0165)	(0.0492)	(0.0708)	(0.171)	(0.269)	(0.0447)	(0.159)	(0.0880)	(0.152)	(0.0331)
Observations	17,206	17,206	17,206	17,206	17,206	17,206	17,650	16,164	11,720	17,206	17,058	17,650	17,616	17,650
R-squared	0.678	0.678	0.675	0.583	0.593	0.707	0.620	0.623	0.627	0.610	0.663	0.710	0.685	0.571
Country specific age trend	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Clustered SE by age-country cluster in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE 7: Estimates of the Impact of Retirement on Social Networks characteristics by Education. Individuals aged 50-70.

VARIABLES	(1) snsize	(2) percfam	(3) percfrien	(4) perccol	(5) percother	(6) strength	(7) percdaily	(8) verysat	(9) snsatis	(10) most_con	(11) percveryclose	(12) family_clos	(13) fam_daily	(14) friend_clos	(15) friend_daily
Retired*nontertiary	0.0737	0.0935***	-0.0156	-0.0252**	-0.0173	0.0626***	0.128**	0.101*	0.216	0.380*	0.0748**	0.300***	0.104	0.00249	-0.0108
	(0.151)	(0.0282)	(0.0236)	(0.0103)	(0.0144)	(0.0205)	(0.0586)	(0.0547)	(0.137)	(0.200)	(0.0339)	(0.111)	(0.0971)	(0.118)	(0.0282)
Retired* tertiary	0.107	0.0994***	-0.0557*	-0.0162	-0.0173	0.0303	0.0685	0.0263	0.0711	0.573**	0.0463	0.225*	0.192*	-0.250	-0.00553
	(0.199)	(0.0342)	(0.0305)	(0.0162)	(0.0144)	(0.0231)	(0.0546)	(0.0590)	(0.145)	(0.225)	(0.0422)	(0.133)	(0.102)	(0.174)	(0.0364)
Observations	37,454	37,454	37,454	37,454	37,454	37,454	37,454	37454	35,666	28,832	37,454	37,130	37454	37454	37454
R-squared	0.687	0.691	0.706	0.580	0.576	0.632	0.669	0.629	0.624	0.614	0.611	0.652	0.695	0.719	0.605
Country specific age trend	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Clustered SE by age-country cluster in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 8: Estimates of the Impact of Retirement on Social Networks characteristics by Pro-Social behaviour. Individuals aged 50-70.

VARIABLES	(1) snsize	(2) percfam	(3) percfrien	(4) perccol	(5) percother	(6) strength	(7) percdaily	(8) verysat	(9) snsatis	(10) most_con	(11) percveryclose	(12) family_clos	(13) fam_daily	(14) friend_clos	(15) friend_daily
Retired*volunteering	0.232	0.0877***	-0.0147	-0.0228**	-0.0130	0.0605***	0.0909*	0.0900*	0.221*	0.479***	0.0648**	0.303***	0.163*	0.0160	-0.00985
	(0.147)	(0.0256)	(0.0227)	(0.0106)	(0.0127)	(0.0183)	(0.0530)	(0.0474)	(0.118)	(0.183)	(0.0308)	(0.101)	(0.0874)	(0.120)	(0.0270)
Retired*no volunteering	0.0491	0.0978***	-0.0341	-0.0215**	-0.0156	0.0484**	0.118**	0.0653	0.151	0.427**	0.0611*	0.266**	0.137	-0.0974	-0.0163
	(0.146)	(0.0252)	(0.0224)	(0.0102)	(0.0129)	(0.0190)	(0.0552)	(0.0489)	(0.121)	(0.193)	(0.0312)	(0.105)	(0.0911)	(0.118)	(0.0269)
Observations	37,454	37,454	37,454	37,454	37,454	37,454	37,454	37454	35,666	28,832	37,454	37,130	37454	37454	37454
R-squared	0.686	0.691	0.706	0.581	0.576	0.633	0.669	0.629	0.624	0.614	0.611	0.652	0.695	0.720	0.605
Country specific age trend	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

Clustered SE by age-country cluster in parentheses

*** p<0.01, ** p<0.05, * p<0.1