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The multidimensional nature of social capital: An empirical investigation for older people in Europe

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Abstract

Social capital is a rapidly expanding research theme within economics and has become a popular concept with policy makers in both developed and developing countries. Despite this growth in popularity, social capital remains a controversial concept among economists. We argue that this is largely due to a fundamental mismatch between the theoretical coverage and the vast majority of empirical work. Utilising data from a large cross-Europe survey of older people we use principal components analysis to demonstrate that social capital has multiple dimensions, and then explore the extent to which these latent dimensions coincide with the theoretical constructs of social capital. We use the association between social capital and a number of measures of health and well-being to demonstrate the importance of taking account of the multiple dimensions of social capital in empirical work. As well as showing that all the underlying constructs of social capital are significantly associated with health and well-being, our results also reveal that while in general this association is positive, close bonding in the form of household ties is inversely related to health and well-being; this contradicts the implicit assumption, often made in the literature that, in relation to social capital, more is always better.

JEL Codes: Z13, I12, J14.

Key words: social capital, health, older people, principal components analysis

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I. INTRODUCTION

Social capital is a rapidly expanding research theme within economics and more broadly across the social sciences[i]; it has also become a popular concept with policy makers in both developed and developing countries (World Bank, 2011; OECD, 2002). Despite this growth in popularity, social capital remains a controversial concept among economists. In his comprehensive review Woolcock (1998) defines social capital as " ... *a broad term encompassing the norms and networks facilitating collective action for mutual benefit.*" (p.155). Durlauf and Fafchamps (2004) accuse social capital research of 'conceptual vagueness', Arrow (1999) has suggested that the term 'social capital' be abandoned, and Fine (2002) has called for wholesale rejection of the concept. Perhaps we should not be surprised that a concept that has emerged from sociological as well as economic traditions should be treated with suspicion by some economists. However, from within sociology itself Portes (1998) has also argued that the concept of social capital has been exported from sociological theory into everyday language, with an accompanying loss in precision and movement away from its original meaning.

We argue that the distaste for social capital that is being expressed here is largely a result of a fundamental mismatch between the theoretical coverage of this important concept and the vast majority of empirical work that has explored various proxies for social capital both as inputs to, and outputs from, social and economic processes. While both economic and sociological theories of social capital explicitly recognise it as a multi-dimensional concept, in most empirical applications the definition of social capital is largely data driven and limited by the very narrow range of proxies that the chosen data set contains; for example Alesina and La Ferrara (2000) use only membership in voluntary organisations, from the US General Social Survey and Kan (2007) uses only a measure of whether or not people think

there is someone living nearby that would help them in an emergency, from the US Panel Study of Income Dynamics. Collapsing social capital to these narrow empirical proxies is inadequate; at best it limits the conclusions that can be drawn from empirical work, and at worst it may lead to erroneous conclusions.

In this paper we contribute to the economic literature on social capital in three main ways. Firstly, we use principal component analysis (PCA) to demonstrate empirically that social capital does have multiple dimensions. Secondly, we aim to bring the empirical work closer to the theory by exploring the extent to which the underlying latent components coincide with the constructs of social capital that have been identified in the theoretical literature. Thirdly, we use the association between social capital and various measures of health and well-being as an example to demonstrate the importance of taking account of the multiple dimensions of social capital in empirical work. Our motivation is a belief that a closer match between theory and empirical measurement will improve the usefulness of social capital as a concept in both research and policy making.

We use rich data from two waves of the Survey of Health Aging and Retirement in Europe (SHARE); the survey covers around 38,000 individuals across 15 countries. Our data contain 20 possible proxies for social capital; including, for example, social participation, giving and receiving help and financial gifts within and outside the family, volunteering, religious behaviours and experience of trust and conflict. In section II we consider the sociological and economic literature on social capital to provide a framework for our empirical work, and to identify the different components of social capital that have been discussed in this literature. Section III outlines the data and our empirical approach. The results are presented in section IV and discussed in section V. Finally section VI summarises our main findings and includes some concluding remarks.

II. THE CONCEPT OF SOCIAL CAPITAL

Social capital as a theoretical concept has emerged from within both economics and sociological traditions. It is a very old idea in sociology, and emerges naturally from a discipline that emphasises methodological collectivism and structure (as opposed to the individualism and agency of economics). Portes (1998) associates the first modern use of the term social capital to Bourdieu (1983) whose work suggests two distinct elements; firstly, social relationships themselves that give individuals access to the resources of other group members, and secondly, the amount and quality of those resources. Paxton (1999) also stresses two related, but slightly different, components of social capital; a 'quantitative' one that refers to the objective associations between individuals, and a 'qualitative' one that refers to the type of associations, which must be reciprocal and trusting. Chalupnicek (2010) has argued that a tension exists in sociology between social capital as an asset of an individual and the importance of its social context. Coleman (1990), for example, takes the former approach in his work on the role of social capital in the creation of human capital; whereas the latter approach is expounded by Putnam (2000) in his work on the decline of civic society in the US. Putnam (2000) stresses two different dimensions along which different forms of social capital can be compared: bonding (or exclusive), which is inward looking and reinforces strong ties among close and homogenous groups, such as those within families, and bridging (or inclusive), which is more outward looking and based on weaker ties between people from more diverse social groupings, such as groups of work colleagues or some religious movements. These dimensions are theoretically distinct but may not be empirically separable since many groups simultaneously fulfil a bonding and bridging function.

Sociological work has focused more on understanding social capital in a conceptual sense, rather than measuring it, indeed sociologists often point to the intangible nature of social capital (Coleman, 1990). However, there are exceptions to this and Putnam (2000) is a significant example, presenting as he does, a huge amount of empirical evidence for the US, which he offers as measures of social capital; these

include rates of joining voluntary associations, citizens' trust of one another and rates of voting. In a work that challenges Putnam's hypothesis of declining social capital, Paxton (1999) also presents evidence using twelve variables from the US General Social Survey, that measure different aspects of individuals' trust in each other, their trust in institutions and the nature of their associations.

Durlauf and Fafchamps (2004) identify three key ideas in the economic approach to social capital: (i) it generates positive externalities for members of a group; (ii) these externalities are achieved through shared trust, norms and values; (iii) shared trust, norms and values arise from informal forms of organisations based on social networks. However, they also point out that there appears to be some confusion in the literature as to whether all three of these ideas are necessary for social capital. Norms and trust, for example, could be based on formal institutions without social networks (see Knack and Keefer, 1997). These ideas have a long tradition in economics, for example Arrow (1972) shows how social connections can compensate for expensive formal structures in facilitating financial transitions, and Kreps et al (1982) show how increased interaction facilitates cooperation. Indeed Bruni and Sugden (2000) point out that, in his *Lectures on Jurisprudence,* Adam Smith (1763/1978) presents a theory of social capital that is quite similar to that of the modern theories of Granovetter (1985) and Putnam (1993). Smith argues that " … reputations for trustworthiness are transmitted through networks of trading relationships; the denser the network … the greater is the value of reputation and so … the greater is the degree of the trust." (Bruni and Sugden, 2000: 33). The theoretical emphasis of the economic social capital literature is on trust, and in particular how trust can improve the efficiency of social exchange (see for example Bellamare and Kroger, 2004; Bowles and Gintis, 2002).

The tensions that have emerged in sociology between social capital as an individual asset or as a societal resource are mirrored in the economic discussion. Glaeser et al (2002) consider individual social capital, constructing a model for social capital accumulation, which treats this largely as a standard investment decision, similar to investment in physical and human capital. This can be criticised for not taking

adequate account of social capital as a group level phenomenon. However, it is hard to operationalise measures of social capital that fully incorporate the externalities and other group effects that are central to the theoretical discussion (Durlauf and Fafchamps, 2004). Measures of generalised trust such as that from the World Values Survey (WVS) are used by, for example, Carlson (2004) and Huang et al (2009). Measures of organisational membership from the British Household Panel Survey are used by Smith (2010); and measures of social interaction are used by Sirven and Debrand (2008; 2012); Barr (2000) uses information on entrepreneurial networks in her study of manufacturing sector performance in Ghana. DiPasquale and Glaeser (1999) consider a number of measures including organisational membership, church attendance, knowledge and involvement in local politics, and concern for local problems. Generally in these studies there is rarely any attempt to link these variables to the broader theoretical constructs. Two exceptions are Sabatini (2008, 2009) who uses his own data set of around two hundred measures of four main social capital dimensions (strong family ties, weak informal ties, voluntary organisations, and political participation) to explore the relationship between bonding and bridging social capital and the quality of economic development in Italian regions; and Bjornskov (2006) who uses data from the WVS to explore Putnam's (1993, 2000) definitions of social capital using PCA.

A large number of empirical studies have considered the relationship between social capital and health; and Scheffler and Brown (2008) set out four (mutually reinforcing) mechanisms on which this relation is based. Firstly, social capital makes information available to group members and this can improve their health decision making and behaviours. Secondly, social capital impacts on social norms within groups, which can have particular influence on health behaviours such as diet and smoking. Thirdly, social capital can enhance the accessibility of health care services within a community. Finally, social capital can offer psychosocial support networks to improve the physical and mental health of group members. It is likely that two-way causality exists between social capital and health, because as well as these mechanisms working from social capital to health; health may also have direct links to social capital via, for example determining an individual's ability to participate in various groups or activities.

Islam et al. (2006) systematically review the empirical evidence on the health/social capital relationship and show that both individual and area level (community) social capital contribute positively to health. Using data from the Health Survey for England, Petrou and Kupek (2008) show that low stocks of social capital across the domains of trust, perceived social support and civic participation are associated with lower levels of individual health. Sirven and Debrand (2008; 2012) and Van Groezen et al. (2011) use the SHARE data that we analyse in the empirical section of this paper. The former authors use social participation as a proxy for social capital and show that this is positively related to health for older people in Europe; additionally they argue that differences in social capital can exacerbate health inequalities. The latter study uses data on trust and civic participation, and finds that while civic participation has a similar positive effect on health across all ten countries they consider, trust only seems to significantly contribute to health in Sweden and Germany.

In the analysis that follows we consider the relationship between social capital and health as an illustration of the importance of recognising the multidimensional nature of social capital. Unlike the studies reviewed above, instead of selecting particular proxies for social capital we use all of the possible social capital measures in the SHARE data, employing PCA to reduce these correlated variables to set of independent factors that reflect the underlying latent components of social capital. We then explore the construct validity of these factors by considering their association with 5 different measures of health and well-being.

III. DATA AND EMPIRICAL APPROACH

We use data from the 2004/5 and 2006/7 waves of the SHARE survey; a cross-national sample including around 38,000 older Europeans in 15 countries[ii]. The main focus of the SHARE survey are individuals aged 50 and over; their spouses can be younger but for this analysis, to maintain the focus on

older people, we use data only for those respondents who are at least 50 years of age. The data comprises rich information on health, socioeconomic characteristics, housing, and social support. SHARE has been used in a number of economic studies; for example Christelis et al (2010) investigate cognitive abilities and portfolio choice, and Kalwij and Vermeulen (2007) consider the health and labour force participation of older people. SHARE includes 20 variables that can be used to proxy for the components of social capital. These are listed in Appendix Table A1; they cover: social participation in various organisations, giving help (outside and inside the family), receiving help, giving financial gifts (outside and inside the family), religious affiliation and participation, and experience of trust and conflict.

Using these proxy variables we derive the latent constructs of social capital using PCA, a data reduction technique that aims to reduce a large set of variables into a smaller number of underlying latent components. The essence of PCA is that the data are reduced into correlations from combinations of all variables and these patterns of correlations are assumed to be indicative of the underlying latent constructs.

For a given set of *j* response variables, *x* (i.e. our proxy variables, like participation in voluntary work, or giving financial gifts to family) $x_1,\ldots,x_j$, the aim is to estimate a set of *k* latent components (or factors) $z_1,\ldots,z_k$, where k<j, that contain essentially the same information, so that $x \in z$. The latent components will account for the dependencies among the response (Jöreskog & Sörbom, 1979). This can be estimated as:

$$E(x_{ij} \mid z_{i1}, z_{i2}, \ldots z_{ik}) = \lambda_{j1} z_{i1} + \lambda_{j2} z_{i2} + \ldots + \lambda_{jk} z_{ik} \qquad (1)$$

Where λ is the loading (correlation between variable and factor) on each of the k latent factors z for each individual i, constructed from j number of response variables, x. The correlations are represented by:

$$\rho_{k,k+1} = \sum_{k=1}^{K} \lambda_k \lambda_{k+1} \qquad (2)$$

The eigenvalue measures the variance in all the variables which is accounted for by that factor. If a linear pattern is assumed, then the standard correlation method is that of Pearson correlations. However, this assumes that both the response variables and the latent components are normally distributed with zero means and unit variances. In our case the response variables are binary or ordinal, and standard PCA is extremely sensitive to non-normality. To overcome this we estimate polychoric correlations using the *polychoricpca* procedure in Stata v.12 (Kolenikov and Angeles, 2009)[iii]. The estimation takes account of the fact that we have repeated observations across two waves of data for some individuals. A general rule of thumb is to retain factors with an eigenvalue greater than or close to 1 (Pugno and Verme, 2011). In general, the factor with the largest eigenvalue has the most variance.

To further explore the validity of the factors that emerge from our PCA, and which we hypothesise represent the underlying latent components of social capital, we consider their relationship with a number of health and well-being measures. Our general estimating equation is:

$$H_i = \alpha + \sum_k \beta_k z_{k,i} + \sum_l \theta_l y_{l,i} + \varepsilon_i \qquad (3)$$

Where z represents each of the k latent factors of social capital and y are a set of l control variables. Estimation takes account of the fact that the errors (ε) are clustered by individual, since some individuals appear in both waves of the data. We consider alternative measures of health (H): *self-assessed health* on a 5 point scale from very poor to excellent; a measure of daily health limitations measured as a binary

variable if a person has *limitations in daily activities (*coded so that 1 is no limitations); the Euro-D *depression* scale, a measure of depression, recoded so that higher levels indicate less depressed (Prince et al., 1999); *life satisfaction*, measured on a scale of 1 to 4; the CASP (Control, Autonomy, Self-realisation, Pleasure) measure of *quality of life* in older people (Hyde et al., 2003). Control variables (*y*) include age, gender, marital status, household income and labour force status. Given that we use data from 15 countries we also use the typology of Esping-Andersen (1999) to control for different welfare regimes, classified as Central (the baseline category), Nordic and Southern European[iv]. Albertini et al (2007) have studied intergenerational transfers of time and money in European countries and find important differences between the welfare regimes. Descriptive statistics and definitions of all variables are provided in Tables A1 and A2.

IV. RESULTS

In Table A1 all of the social capital variables are coded so that they increase in social capital. For example for the first variable 'volunteering' the possible values are based on frequency of the activity in the past month; 0 represents no volunteering, 1 is less than weekly, 2 is weekly and 3 is daily. Similarly for the dichotomous 'conflict' variables, 1 represents rarely or never experiencing of conflict, whereas 0 represents more frequent experience of conflict. In terms of social participation, the highest frequency is for clubs, followed by volunteering, education and training, and finally political and community organisations. 57% of respondents have a religious affiliation, but most respondents have not participated in a religious organisation in the past month. The mean values show that helping family (outside the household) is more frequent that helping non-family. In contrast the prevalence of giving and receiving help within the household is relatively low, at 5.6% and 3.8% respectively. However, 31% of respondents have looked after grandchildren in the past year. 20% of respondents have given a financial gift of more than 250 Euros to a family member in the last year, and only 1.7% have given to non-family members. Receipt of financial gifts is much lower than this; 4% from family and only 0.4%

from non-family. 88% rarely or never experience conflict with family members, and 74% rarely or never experience conflict with non-family.

In Table A2 the mean age of individuals in the sample is 64, 30% are employed and 76% are married or living as a couple. Average self-assessed health is rated at 3 on the 1 to 5 scale; however, 58% of respondents have some limitations in daily activities. The average quality of life (CASP) and depression (EURO-D) scores are similar to those found for comparable samples (Castro-Costa et al 2077; Sim et al 2011), showing relatively high quality of life and low prevalence of depression.

Table 1 reports the results of the PCA. The first four factors identified have an eigenvalue greater than 1; the fifth factor has an eigenvalue of 0.65, hence only the first four factors are retained. These results suggest that there are four linearly independent factors onto which all 20 input variables load; these factors can be thought of as representing the underlying latent components social capital. The weights for the four factors show that together they contribute 93% of the total variance; and the relative weights show that, for example, Factor 1 explains 33% of the total variance, Factor 2, 27% and so on.

Table 1 here

To explore which variables are most strongly associated with each factor we consider the factor loadings for the PCA; these results are reported in Table 2 and they enable us to relate the four factors to the underlying components of social capital. Essentially the loadings can be interpreted as the correlation between the observed variable and the underlying component, thus the higher the loading, the stronger the correlation between that variable and the factor.

Table 2 here

Taking the factors in reverse order; the greatest loadings on Factor 4 are for giving and receiving *help in the household* and *personal care for others*. This suggests that Factor 4 is representative of *close household ties* and specific personal help, which can be thought of as a particularly close, or exclusive, form of bonding social capital. Factor 3 relates most strongly to the *trust* and *conflict* variables, which can be interpreted as measuring the quality of relationships, as opposed to simply quantity measures like social participation and the act of giving or receiving help. Measures of trust are central to the economics of social capital, since they reflect the potential for positive externalities. *Minding grandchildren*[v] also loads to Factor 3, and while at first sight this appears not to fit easily alongside trust and conflict, it is however the case that parents willingness to leave their children in the grandparents care will be heavily affected by how well they trust them and get on with them (Wheelock & Jones, 2002). The greatest loadings for Factor 2 are from *religious affiliation* and *praying* (however note that *religious participation* loads with Factor 1, see below). Religion can be interpreted as contributing to both bridging (inclusive) and bonding (exclusive) social capital, depending on the extent to which it provides support within a community based on shared beliefs, or reaches outwards via an ethos of service to others. Finally, Factor 1 (by definition) accounts for the largest proportion of the variance (see Table 1), the highest loadings are from a heterogeneous set of variables, which include helping people outside the household, volunteering, social participation and group membership, as well as giving and receiving financial gifts. With the possible exception of volunteering (which can involving providing support to diverse groups), this factor seems to largely reflect bonding, rather than bridging, social capital.

The relationship between the derived factors (underlying components of social capital) and the alternative health measures is explored via estimation of equation (3); the results are reported in Table 3, and all of the health measures are coded to be increasing in health. The general finding is that all four underlying components are significantly associated with all five health measures. For the first three components the association is positive, suggesting that better health is associated with higher levels of these aspects of social capital; but for Factor 4 (which is a latent measure of *close household ties and personal*

care) the relationship with all of the health measures is negative. The relative importance of the four components differs depending on which health measure we consider. For self-assessed general health and daily limitations Factor 1, which represents largely bonding social capital, has the largest effect. For quality of life (CASP) and life satisfaction Factors 3 (*trust and conflict*) and 1 have similar sized effects. For depression (Euro-D) Factor 3 is the most important. For all of the health measures Factor 2 (*religious affiliation and praying*) is least important, but for quality of life and depression the effect is still relatively large.

The effects of the conditioning variables are all as expected. There is a positive association between income and health for all measures except daily limitations. Being married or living as a couple is associated with better health; and so is being employed. Health is a declining non-linear function of age; which varies in form depending on the health measure in question. On average residents of Nordic (Southern) welfares regimes have better (worse) health than residents of the Central region, except for daily limitations which are worse (better).

V. DISCUSSION

The PCA has reduced the 20 proxy variables from the SHARE data to four underlying components. These components relate to the theoretical constructs of social capital in that they appear to reflect four different aspects: Factor 1 – mainly bonding; Factor 2 - religious participation and affiliation; Factor 3 - largely trust and conflict; Factor 4 – close bonding, via strong household ties and personal care. Our finding that all four of the underlying components of social capital are significantly associated with a number of different health and well-being measures, provides some measure of validity for the factors and also adds weight to the argument that social capital is a multidimensional concept and it is not adequate to reduce it to simple measures of social participation or generalised trust, as so often happens in empirical studies. Further, it is not the case, as so much of the literature seems to imply, that more

social capital is always better. Our results show that while three of the components are positively related to health and quality of life, the fourth component (strong family ties) has a negative association.

These results find support in the existing literature. In his exploration of social capital across Italian regions, Sabatini (2008) found that strong family ties were a particular form of social capital network, which were negatively correlated with civic awareness and social participation. Durlauf (1999) has argued that social capital can lead to adverse outcomes given there is no guarantee that the behaviours that sustain all forms of social capital are socially desirable. He points to the fact that strong group ties can have negative consequences for the treatment of others. Durlauf and Fafchamps (2004) also point out that strong social ties can lead to negative externalities; and it seems reasonable that helping within the household and providing personal care, while contributing to a particularly close form of bonding, may also detract from other aspects of social capital that require more outward looking behaviour. Further, religious beliefs and behaviour have been identified previously as having a specific role in social capital formation. For example, Scheffler and Brown (2008) argue that religion can play multiple roles in sustaining health by bonding communities, affecting social norms and conveying information on health related behaviours. The fact that experience of trust and conflict has a strong association with quality of life and depression finds support from the systematic review of the evidence on the relationship between social capital and mental health carried out by De Silva et al (2005).

Both Durlauf and Fafchamps (2004) and Sobel (2002) stress that the empirical literature on social capital often confuses cause and effect; and many empirical applications with social capital as both an input and an output variable are characterised by endogeneity. Like Glaeser et al (2002), our work is not exempt from this issue, but we abstract from it here because the regressions we estimate above are not causal models. We simply measure the association between the underlying components of social capital and a range of health variables. This is useful as a test of the multidimensional of social capital, and to provide

support for the validity of the underlying constructs we derive from the PCA via their associations with the measures of health and well-being.

VI. CONCLUSION

We have contributed to the social capital literature in three ways. Exploration of a relatively large number of proxy variables via PCA demonstrates empirically that social capital has a number of underlying latent components. These components relate to the constructs of social capital that have been identified in the theoretical literature; independent factors relating to bonding, religious behaviour, trust and conflict, and strong household ties are derived. Finally, we use the association between these constructs and a number of alternative measures of health and well-being, for older people in 15 European countries, to demonstrate the importance of taking account of the multiple dimensions of social capital in empirical work. All four of the underlying components are significantly associated with our health measures, and while three of these have a positive association, for one the relationship is negative.

The existing literature has often neglected the negative aspects of social capital, arguing largely that where social capital is concerned more is better. Our results run counter to this because they show that while the three factors reflective of bonding, religious behaviour, and experience of trust and conflict are positively associated with all of our health measures, the fourth, relating to strong household ties and the provision of personal care, is inversely related to health and well-being. Further work is needed to disentangle the causal mechanisms underlying these relationships. However, we emphasise the need to incorporate a full range of proxy indicators of social capital into the analysis of health outcomes, and not simply indicators of social participation or measures of generalised trust. We also caution against the assumption that more social capital is always better, and call for further work into the potential negative aspects of social capital.

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Table 1: Principal Component Analysis of all social capital proxy variables from SHARE

	Eigenvalue	Proportion of variance	Cumulative proportion of variance
Factor 1	2.3888	0.3320	0.3320
Factor 2	1.9173	0.2665	0.5985
Factor 3	1.2527	0.1741	0.7726
Factor 4	1.1262	0.1565	0.9291
Factor 5	0.6544	0.0910	1.0201

Notes: Factors with eigenvalues greater than 1 are retained. 93% of the variance in SCI is explained by the first 4 factors. n=27,636

Table 2: Factor loadings from Principal Components Analysis

Proxies for Social Capital	[1] Factor 1	[2] Factor 2	[3] Factor 3	[4] Factor 4
Volunteering	**0.5694**	-0.1645	0.0889	-0.0733
Education/training	**0.4453**	-0.2019	0.1050	-0.0582
Political or community organisation	**0.4370**	-0.1875	0.0700	-0.1130
Religious participation	**0.4346**	0.2412	-0.0409	-0.0572
Helping friends/neighbours	**0.4042**	-0.1944	-0.1075	0.0053
Financial gifts to non-family	**0.3972**	-0.1127	-0.2223	-0.1539
Club participation (sport, social, other)	**0.3727**	-0.2362	0.1853	-0.0802
Helping family (outside household)	**0.3705**	-0.2014	0.0514	0.2430
Financial gifts to family	**0.3573**	-0.1347	-0.0077	0.0497
Financial gifts from non-family	**0.3205**	-0.0876	-0.2908	-0.0037
Financial gifts from family	**0.2146**	-0.0657	-0.0700	0.1070
Praying frequency	0.3682	**0.8856**	-0.1406	-0.0297
Having a religious affiliation	0.3903	**0.8272**	-0.0387	-0.0465
Conflict with family	0.1037	0.1338	**0.6270**	0.3133
Conflict with others	0.0623	0.1502	**0.5975**	0.2852
Experience of Trust	0.0684	0.0688	**0.1961**	0.0361
Minding grandchildren	0.0964	-0.0086	**0.1750**	0.0776
Giving help in the household	-0.0532	0.0433	-0.3045	**0.6486**
Personal care for others	0.4313	-0.2063	-0.2481	**0.5119**
Receiving help in the household	-0.3275	0.1456	-0.2122	**0.3547**

Notes: Bold indicates strongest factor loading for each variable.

Table 3: Regressions between Health Indicators and Social Capital Factors from PCA

	Self-Assessed Health	Daily Limitations	Quality of Life CASP	Depression EURO_D	Life Satisfaction
Factor 1	0.5888***	0.3811***	1.4164***	0.5749 ***	0.3638***
	(0.0184)	(0.0233)	(0.0698)	(0.0338)	(0.0198)
Factor 2	0.0542***	0.0405***	0.4712***	0.3693***	0.0907***
	(0.1047)	(0.0128)	(0.0433)	(0.0211)	(0.0113)
Factor 3	0.2873 ***	0.2286***	1.5789***	0.9402***	0.3304***
	(0.0201)	(0.0246)	(0.0846)	(0.0408)	(0.0217)
Factor 4	-0.2940***	-0.2416**	-0.8182***	-0.5779***	-0.1387***
	(0.0222)	(0.0275)	(0.0920)	(0.0461)	(0.0242)
Household income	0.0112***	-0.0006	0.1329***	0.0473***	0.0252***
	(0.0034)	(0.0040)	(0.0143)	(0.0076)	(0.0037)
Living with spouse/partner	0.1312***	0.0715***	1.3686***	0.6397***	0.4650***
	(0.0211)	(0.0255)	(0.0910)	(0.0481)	(0.0229)
Male	0.0327**	0.1079***	0.0087	0.7065***	0.0023
	(0.0137)	(0.0167)	(0.0551)	(0.0270)	(0.0149)
Age	0.0211**	0.0793***	0.3026***	0.1989***	0.0290***
	(0.0093)	(0.0116)	(0.0372)	(0.0198)	(0.0099)
Age squared	-0.0003***	-0.0007***	-0.0024***	-0.0015***	-0.0002**
	(0.0001)	(0.0001)	(0.0003)	(0.0001)	(0.0001)
Employed	0.5126***	0.5259***	1.1249***	0.5816***	0.2713***
	(0.0189)	(0.0232)	(0.0732)	(0.0358)	(0.0202)
Nordic	0.3574***	-0.1020***	0.2251***	0.0032	0.1241***
	(0.0208)	(0.0249)	(0.0714)	(0.0353)	(0.0215)
Southern	-0.0601**	0.2136***	-2.4764***	-0.4089***	-0.2261***
	(0.0164)	(0.0202)	(0.0684)	(0.0343)	(0.0175)
N=	26,722	26,720	25,228	26,486	26,241

Notes:*, **, *** denotes significance at p=0.10, p=0.05, p=0.01,
Coefficients from OLS models for CASP and EURO_D, probit for Daily Limitations, and ordered probit for SAH and Life Satisfaction. Sample sizes vary due to missing values.

Table A1: Definitions and Summary Statistics for of Social Capital Proxy Variables

Proxy Variable	Definition	Mean	Min.	Max.
Volunteering	Volunteering in the last month	0.2191	0	3
Education/training	Attended an education/training course in the last month	0.1138	0	3
Political or community organisation	Taken part in a political or community-related organization in the last month	0.0637	0	3
Club participation (sport, social, other)	Gone to a sport, social or other kind of club in the last month	0.3686	0	3
Religious participation	Taken part in a religious organization in the last month	0.2195	0	3
Having a religious affiliation	Attached to a religion	0.5705	0	1
Praying frequency	Frequency of praying	1.7611	0	6
Helping people within the household	Given help to person in the household in last 12 months	0.0560	0	1
Receiving help within the household	Receiving help from person in the household in the last 12 months	0.0382	0	1
Helping family (outside household)	Given help to family member outside household in last 12 months	0.6259	0	4
Personal care for others	Cared for sick or disabled adult in the last month	0.1581	0	3
Minding grandchildren	During the last twelve months, regularly or occasionally looked after grandchildren without the presence of the parents	0.3111	0	1
Helping friends/neighbours	Given help to friend or neighbour in last 12 months	0.2536	0	4
Financial gift to family	Given any financial or material gift or support amounting to 250 euro (in local currency) or more, to non-family	0.2033	0	1
Financial gift from family	Receipt of financial or material gift or support as above, from family	0.0403	0	1
Financial gifts to non-family	Given any financial or material gift or support as above to non-family	0.0169	0	1
Financial gift from non-family	Receipt of financial or material gift or support as above from non-family	0.0043	0	1
Conflict with family	Experience of (low) conflict with family	0.8807	0	1
Conflict with others	Experience of (low) conflict with non-family	0.7367	0	1
Experience of trust	Level of trust in people	2.9506	0	5

Table A2: Definitions and Descriptive Statistics for Variables in the Regressions Models

Variable	Definition	Mean	Min	Max
Self-Assessed Health	1 to 5, 5=excellent	3.0196	1	5
Limitations in daily activities	1 if…., 0 otherwise	0.5796	0	1
Quality of life (CASP)	Measure of quality of life among older people	34.52	15	48
Depression (Euro-D)	Measure of Depression 1=Very depressed 12=Not depressed	9.697	0	12
Life Satisfaction	Measure of life satisfaction	3.3140	1	4
Age	Age in years	64.3	50	99.8
Marital Status	1 if married/living with spouse, 0 otherwise	0.7575	0	1
Log equivalised household Income	annual household income (in euros)	5.61	-9.21	15.40
Employed	1 if employed, =0 otherwise	0.2951	0	1
Welfare regimes[1]:	1 if in that regime, 0 otherwise			
Nordic,		0.1385	0	1
Central,		0.5907	0	1
Southern		0.2723	1	1

Notes: [1] Welfare regimes defined according to Esping-Andersen (1999); Nordic: Denmark, Sweden; Central: Austria, France, Netherlands, Switzerland, Portugal, Czech Republic, Ireland, Germany, Belgium; Southern: Greece, Italy, Spain, Israel.

Endnotes

[i] A search of the SCOPUS database shows 33 papers with 'social capital' in the title from 1960 to 1990, and 5,327 from 1991 to May 2014.

[ii] The SHARE countries are classified as *Nordic*: Denmark, Sweden; *Central European*: Austria, France, Netherlands, Poland, Czech Republic, Ireland, Switzerland, Germany, Belgium; *Southern European*: Greece, Italy, Israel, Spain. (www.share-project.org)

[iii] Polychoric PCA is computationally intensive; however it produces consistent estimates of the proportion of explained variance, whereas other procedures produce estimates that are biased downwards.

[iv] See Note ii.

[v] It is worth stressing here that our sample of SHARE respondents are all aged 50 and over.