



Munich Personal RePEc Archive

Social participation and self-rated psychological health

Fiorillo, Damiano and Lubrano Lavadera, Giuseppe and
Nappo, Nunzia

University of Napoli Parthenope, University of Salerno, University of
Napoli Federico II

3 August 2016

Online at <https://mpa.ub.uni-muenchen.de/72879/>
MPRA Paper No. 72879, posted 05 Aug 2016 04:57 UTC

Social participation and self-rated psychological health

Damiano Fiorillo

Department of Business and Economics, Parthenope University
damiano.fiorillo@uniparthenope.it

Giuseppe Lubrano Lavadera

Department of Economics and Statistics, Salerno University
glubrano@unisa.it

Nunzia Nappo

Department of Political Science, Federico II University
nunzia.nappo@unina.it

Abstract

Although structural and cognitive social capital have been hypothesized to have positive influence on psychological health, few papers found positive correlation and causal relationship between social capital dimensions and psychological wellbeing. This longitudinal study investigates the effect of social participation in associations - member, active, member and active - on self-rated psychological health using five waves of the British Household Panel Survey that follows the same individuals between years 1991 and 1995. Self-rated psychological health is assessed by single items of the General Health Questionnaire (GHQ-12). Using ordered logit fixed effect methods the paper shows that being member and active in associations increases all “positive” items of self-rated psychological health and decreases two main “negative” items of psychological wellbeing.

JEL codes: C23, D71, I10, I31, Z1

Keywords: social capital, social participation, psychological health, ordered logit fixed effect, British Household Panel Survey

1. Introduction

In the last years, in the public health literature the number of empirical papers, which have tested the association among social interaction, social participation in various kinds of associations and social trust (grouped together under the common label of social capital), and psychological health has been increasing.

Defined by Putnam (Putnam 1995, 65) as “features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit”, the concept of social capital is described as characterized by a structural and a cognitive dimension (Uphoff 1999). Structural social capital deals with individuals’ behaviors and mainly takes the form of networks and associations that can be observed and measured through surveys. Cognitive social capital derives from individuals’ perceptions, resulting in norms, values and beliefs that contributes to cooperation (Fiorillo and Sabatini 2011). Psychological health is “a state of wellbeing in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (Ding et al. 2015). The General Health Questionnaire (GHQ) (Craig 2007) provides the most common assessment of psychological wellbeing. The GHQ makes available a self-reported measure of mental health and consists of questions regarding the respondent’s emotional and psychological health over the past few weeks that precede the interview. It captures mental health problems that are current in an individual’s life (Lordan and Pakrashi 2014). Available in a variety of versions using 60, 30, 28 or 12 items, the 12-item version (GHQ-12) is the most broadly used screening instrument for common mental disorders, in addition to being a more general measure of psychological wellbeing (del Pilar Sánchez-López and Dresch 2008).

Structural and cognitive social capital have been hypothesized to have positive effect on psychological health for three reasons. Firstly, social capital increases the dissemination of positive health messages, health behaviors norms and access to resources, i.e. greater availability and use of prevention services. Secondly, it deters socially “deviant” behaviors (i.e. alcohol consumption, smoking and crime), which are precursors of worsen psychological wellbeing. Finally it increases social ties and community integration (see Giordano and Lindström 2011; Lindström and Giordano 2016).

Although some papers found a positive associations between cognitive social capital and self-rated psychological health (Bassett and Moore 2013; Giordano and Lindström 2011; Ahnquist et al. 2012; Lindström and Giordano 2016), and few papers showed a positive

correlation between structural social capital and self-rated psychological health (McCulloch 2001; Lindström 2004). There is not yet enough evidence that supports the causal association between social capital dimensions and psychological health. This is due to some problems such as cross-sectional data, omitted variables, diverging methodologies and psychological health measures (McKenzie et al. 2002; Henderson and Whiteford 2003; De Silva et al. 2005; Lindström and Mohseni 2009; Basset and Moore 2011).

The aim of this paper is to study the effect of structural social capital on self-rated psychological health over a five-year period. For this purpose, we use longitudinal data from 1991 to 1995 of the British Household Panel Survey (BHPS). We select those who are member, active, and member and active in associations, as measures of structural social capital; the 12-item General Health Questionnaire (GHQ-12) individually as measure of self-rated psychological health, and fixed effect model specifications with a dependent categorical variable as implemented by Baetschmann et al. (2015). The paper adds all these contributions to the existing body of research showing that being member and active in associations matters for psychological health.

The paper is structured as follows. Section 2 reviews the literature. Then section 3 describes data and methodology. Sections 4 and 5 present and discuss the empirical results. The last section concludes.

2. Related literature

2.1. Social capital

The concept of social capital gained popularity in the Nineties by means of Putnam et al. (1993), but it is traced back to the works of Bourdieu (1980) and Coleman (1988). According to Coleman, while the concept of “social” refers to relations among people, the conception of “capital” implies that relationships are economic resources (Coleman 1988, S98; 1990, 302 and 305)¹. A concept used in a similar way was found, according to Coleman, in Bourdieu (1980) (Coleman 1990, 300)². Thus, Coleman, as well as Bourdieu, uses the concept in functional terms, focusing on the benefits that individuals derive from participation in a social network. Putnam and colleagues regard social capital as “features of social organisation such

¹ Social capital is defined by its function. It is not a single entity but a variety of different entities with two elements in common: they all consist of some aspects of social structure, and facilitate certain actions of agents – both people and firms – within the structure (Coleman 1988, S98; 1990, 302).

² Bourdieu defines social capital as “the sum of actual or potential resources linked to possession of a durable network of relationships of mutual understanding and recognition more or less institutionalized” (Bourdieu and Wacquant 1992, 119, expanded from Bourdieu, 1980, 2).

as trust, norms and networks that can improve the efficiency of society by facilitating coordinated actions” (1993, 167). With Putnam the concept leaves the characteristic of individual resource to become a resource which is capable of solving problems of collective action (Portes 1998, 181). These perspectives have highlighted that social capital can be both an individual and a collective attribute (Kawachi 2006; Portinga 2006a,b; Islam et al. 2008; Murayama et al. 2012). It can be operationalised as social participation/social networks and trust (Lindström 2004; Fujiwara and Kawachi 2008; Giordano and Lindström 2010; Giordano et al. 2012) representing, respectively, the structural and cognitive dimension of social capital (Uphoff 1999). Social participation/social networks is an empirically directly observable aspect of social capital that can be measured by asking respondents to what extent they are engaged in formal and informal social activities. Trust represents a more immaterial aspect of social capital that is objectively measurable to a lesser extent (Lindström 2004).

In this paper, we focus on the individual structural dimension of social capital and refer to the definitions of Bourdieu (1980) and Coleman (1988) according to whom social capital is an individual resource that individuals can access through social participation/social networks. We adopt the indicator (available in BHPS dataset) that most closely fits with the above definitions, i.e. social participation in associations. This approach has the advantage of simplifying the analysis and the interpretations of the results but the disadvantage of losing the multidimensionality of the concept.

2.2. Social capital and psychological health

A number of empirical papers have estimated the link between individual social capital and psychological health. Some authors provide interdisciplinary reviews of primary evidence (Almedon 2005; De Silva et al. 2005). Some studies adopt a cross-section perspective and look at the association between alternative measures of social capital and self-rated psychological health, at individual level. McCulloch (2001) utilizes the BHPS, years from 1998 to 1999, to study if neighbourhood problems, as measure of social capital, are correlated to the 12-item General Health Questionnaire (GHQ) (Golderberg and Williams 1988) as measure of morbidity. Logistic regressions show that people in the lowest categories of social capital have highest probability to report risk of psychiatric morbidity than people in the highest social capital category. Lindström (2004) studies the association between social capital (social participation and trust) and self-reported psychological health in Southern Sweden for the year 2000. Logistic estimations find that both higher trust and social

participation are positively associated with self-reported psychological health. Ahnquist et al. (2012) also analyse, for Sweden, social and economic determinants of psychological distress, employing the 12-item General Health Questionnaire (GHQ-12) for the year 2009. Logistic regressions find a negative association between trust and psychological distress for men and women, and a negative correlation between social participation and psychological distress only for men. Finally, Bassett and Moore (2013) investigate the association among the psychological and the network dimensions of social capital and depressive symptoms obtained from the 10-item Depression Scale (CES – D Scale) (Radloff 1977). Logistic regressions show that individuals with high levels of trust were less likely to have depressive symptoms.

Other evidences use longitudinal data to study the effect of structural and cognitive dimension of social capital on self-rated psychological wellbeing. Giordano and Lindström (2011) investigate on the link between social capital, measured by interpersonal trust, active social participation, frequency of talking with neighbours, and changes in self-rated psychological health obtained by means of the 12-item General Health Questionnaire (GHQ-12) (Golderberg and Williams 1988) with the BHPS from 2000 to 2007. Using generalized estimating equations with an autoregressive working correlation structure, the authors show that trust is the only social capital variable to maintain a positive and highly significant effect on self-rated psychological health. Lindström and Giordano (2016) employ data from BHPS pre - and immediately post – the 2008 crisis to compare the buffering effects of generalised trust and social participation against worse psychological wellbeing (GHQ-12) during and after the 2008 financial crisis. By using logistic models the authors found that individuals with low levels of trust had an increased risk of worse psychological wellbeing in 2008 compared to 2007, while social participation was not associated with psychological health.

2.3. The present study

In the light of the studies surveyed above, we aim to test the longitudinal relationship between social participation in associations and self-rated psychological health in the UK. In particular, our original contribution to the literature is analyzing whether being member, active, and member and active in associations, we accounted for within the study, are effectively beneficial for perceived psychological health using single item of GHQ-12 between years 1991 and 1995 and ordered fixed effect model specifications. Previous studies on the UK have found no association between social participation and indexes of self-rated

psychological health obtained from the GHQ-12 (Giordano and Lindström 2011; Lindström and Giordano 2016).

Following the literature, we argue that structural aspects of social capital, i.e. being a member, active, and member and active in associations may affect psychological wellbeing through:

1) *Social influence*. It regards to the way by which members of social organizations obtain normative guidance about health relevant behaviors, such as physical activity, alcohol consumption or cigarette smoking, which in turn may have positive influence on mental health (Kawachi and Berkman 2001; Han 2015).

2) *Social integration*. Integration in social organizations may have direct positive effect on psychological states through a sense of purpose, belonging and security as well as recognition of self-worth and self-esteem (Brunner and Marmot 1999; Cohen et al. 2000; Schultz et al. 2008).

3) *Social location*. Location in social organizations enhances the likelihood of accessing to various forms of support, such as access to health appropriate information and/or informal health care, which, in turn, protect against psychological distress (Lin et al. 1999; Phongsavan et al. 2006).

4) *Buffering effect*. Social interactions in organizations provide morale and affective support which may reduce either negative emotional reaction to a stressful event or dampen the psychological responses to stress (Kawachi and Berkman 2001; Harpham et al. 2002).

3. Data e methodology

3.1. Data

The British Household Panel Survey (BHPS) is a longitudinal survey of randomly selected private households in Great Britain. Individuals within selected households have been annually interviewed with a view of identifying social and economic change inside the British population. The BHPS data contain information on various domains of the respondents' lives, ranging from income to jobs, household consumption, education, health, social and political values. We use the waves 1-5 (years from 1991 to 1995) because our variable of interest related to social participation in associations is continuously present in those waves.

3.2. Dependent variables

The dependent variables in this study are self-rated psychological health, obtained using the 12-item General Health Questionnaire (GHQ-12). The twelve items are all ordinal variable varying from 1 to 4. These variables are:

- 1) *ghqa: concentration. Have you recently been able to concentrate on whatever you are doing?*
- 2) *ghqb: loss of sleep. Have you recently lost much sleep over worry?*
- 3) *ghqc: playing a useful role. Have you recently felt that you were playing a useful part in things?*
- 4) *ghqd: capable of making decisions. Have you recently felt capable of making decisions about things?*
- 5) *ghqe: constantly under strain. Have you recently felt constantly under strain?*
- 6) *ghqf: problem overcoming difficulties. Have you recently felt you could not overcome your difficulties?*
- 7) *ghqg: enjoy day-to-day activities. Have you recently been able to enjoy your normal day-to-day activities?*
- 8) *ghqh: ability to face problems. Have you recently been able to face up to problems?*
- 9) *ghqi: unhappy or depressed. Have you recently been feeling unhappy or depressed?*
- 10) *ghqj: losing confidence. Have you recently been losing confidence in yourself?*
- 11) *ghqk: believe in self-worth. Have you recently been thinking of yourself as a worthless person?*
- 12) *ghql: general happiness. Have you recently been feeling reasonably happy, all things considered?*

The 12-item GHQ-12 comprises six “positive” and six “negative” items concerning the past few weeks (Hu et al. 2007). Positive items include 1, 3, 4, 7, 8 and 12 listed above. The remainders are negative items. Positive items having as responses: “Better than usual”, “Same as usual”, “Less than usual” and “Much less than usual”. Responses to negative items are: “Not at all”, “No more than usual”, “Rather more than usual” and “Much more than usual”. All items are rescored so that a low score is indicative of endorsement of these items (i.e. Better than usual/Not at all) while higher scores indicate greater difficulty of these items (i.e. Much less than usual/Much more than usual). Table 1 illustrates descriptive statistics.

3.3. Social participation

Social participation within organizations is measured by asking the respondent the following questions: i) “are you currently a member of any of the kinds of organizations on this card?”; ii) “are you currently active in any of the kinds of organizations on this card?”.

We consider the following kinds of organizations: environmental group, parents association, tenants group, religious group, voluntary group, other community group, social group, sports club, women institute, women group, other organizations.

We build three binary independent variables. *Member* equal to 1 whether the respondent is a member at least of one of the organizations listed above. *Active* equal to 1 if the respondent is active at least in one of the organizations listed above. *Member*Active* equal to 1 if the respondent is a member and active at least in one of the organizations listed above.

Table 1. Twelve items GHQ descriptive statistics

	mean	sd	min	max
1) ghqa : concentration	2.162	0.549	1	4
2) ghqb : loss of sleep	1.856	0.787	1	4
3) ghqc : playing a useful role	2.017	0.587	1	4
4) ghqd : capable of making decisions	1.957	0.507	1	4
5) ghqe : constantly under strain	2.117	0.789	1	4
6) ghqf : problem overcoming difficulties	1.812	0.716	1	4
7) ghqg : enjoy day-to-day activities	2.130	0.589	1	4
8) ghqh : ability to face problems	2.021	0.493	1	4
9) ghqi : unhappy or depressed	1.919	0.824	1	4
10) ghqj : losing confidence	1.645	0.744	1	4
11) ghqk : believe in self-worth	1.393	0.650	1	4
12) ghql : general happiness	2.013	0.570	1	4
# <i>Observation</i>	45168			

3.4. Control variables

In order to control for other factors that might influence simultaneously psychological health and social participation, we include in the analysis a full set of socio-demographic variables (see Giordano and Lindström 2011).

At the individual level, we account for age (c_age)³, marital status (*married*), the number of individuals living in the household (*hsize*), the number of children in household (<16 years) (*children*), educational level (*o_cse*, *hnd_a*, *degree*, with no qualification as reference category), the equivalent uninflated income (in logarithm), self-defined current economic status (*employed*, *unemployed*, *retired*, *otheremp*), and the number of visits to GP or family doctor (*hl2gp*). Regional and year fixed effects are also included (with Inner London and year 1991 as reference categories). Table 2 reports summary statistics.

3.5. Methodology

Riedl and Geishecker (2014) report the absence of a consistent estimator for fixed effect ordered dependent variable. They list six estimation strategies adopted to circumvent this problem for ordered logit. They find that the smallest biased and more efficient estimator for

³ Introducing at the same time a variable and its square in a regression can induce a relative high level of collinearity (Chatterjee and Hadi 2015). To avoid this problem we centered the variable age and its square subtracting their average.

the ordered logit with fixed effects is implemented by Baetschmann et al. (2015). Even if this is a recent estimation strategy it was already used in other studies (Brown and Gray 2015; Dickerson et al. 2014; Frijters and Beaton 2012; Geishecker et al. 2012; Mujcic and Frijters 2015).

Table 2. Descriptive statistics of social participation and all control variables

		mean	sd	min	max
Member	= 1 if member of at least one of the organizations	0.515	0.500	0	1
Active	= 1 if active in at least one the organizations	0.478	0.500	0	1
Member*Active	= 1 if member and active	0.413	0.492	0	1
C_age	= demeaned age = age-mean(age)	-0.315	18.26	-29.01	52.99
Married	= 1 if married	0.569	0.495	0	1
Hsize	= number of household members	2.880	1.355	1	11
Children	= number of children in the household	0.592	0.947	0	9
Degree	= 1 if graduated	0.0879	0.283	0	1
Hnd_a	= 1 if higher school	0.302	0.459	0	1
O_cse	= 1 if lower than lower school	0.109	0.312	0	1
Lnincome	= logarithm of equivalised real income, adjusted using the Retail Price Index and McClement's scale to adjust for household size and composition	9.219	0.716	-0.524	12.04
Employed	= 1 if works in the year	0.588	0.492	0	1
Unemployed	= 1 if unemployed in the year	0.333	0.471	0	1
Retired	= 1 if retired in the year	0.0376	0.190	0	1
Otheremp	= 1 if nor employed nor unemployed either retired	0.0412	0.199	0	1
Hl2gp	= number of visits to GP: 1 = none, 5 = more than ten	2.375	1.188	1	5
# Observation		45168			

All strategies to estimate the fixed effects ordered logit simplify the problem transforming the ordered into a binary problem. As we know, it does exist a logit fixed effect estimator (Chamberlain 1980), assuming the independence of the dependent variable from the fixed effect, it makes the fixed effect disappear. For all those methods, the observations that do not change their original order value do not contribute at coefficient estimation.

Baetschmann et al. (2015) suggest an approach in two stages: “Blow Up and Cluster” (Hereafter BUC). In the first stage, BUC replaces each observation with k-1 observations (k are the number of ordered categories) and dichotomises each observation obtained. In the second stage, the fixed effect logit is used over the entire sample. Observations are dependent by construction and to overcome this problem, estimation uses the individual cluster.

We implement BUC estimation in following way. We use the twelve items individually (*ghq-12*) as dependent variables to understand if *member*, *active*, and *member*active* are linked to single *ghq*, controlling for all other variables (*Z*);

$$ghq_{it} = \alpha + \beta_1 member_{it} + \beta_2 active_{it} + \beta_3 member_{it} * active_{it} + \gamma Z_{it} + u_i + \varepsilon_{it} \quad (1)$$

4. Results

In this section, we present the estimations of the empirical models described in previous section. Table 3, Columns (1-6), and Table 4, Columns (7-12), report the results of the fixed effects ordered logit models, using the longitudinal dataset previously described, for the single items of the GHQ-12. In all columns, we show all the predictors. For each item, we present coefficients and standard errors (in parentheses), which are corrected for heteroskedasticity through individual cluster level. Overall, our data highlight three major findings.

First, the estimates of the parameters associated to $member_{it}$ and $active_{it}$ are not statistically significant in almost all the GHQ-12 items with the exception of *believe in self-worth* (ghqk), *concentration* (ghqa) and *loss of sleep* (ghqb). In particular, our results indicate that being a member of at least one association increases the likelihood of reporting “better than usual” in *believe in self-worth* (ghqk) (statistically significant at 5%, $p < 0.05$). Furthermore, individuals who are active at least in one associations have higher probability to declare, respectively, “better than usual” in *concentration* (ghqa) ($p < 0.05$) and “much more than usual” in *loss of sleep* (ghqb) ($p < 0.05$). The evidences on the other GHQ-12 items seem in line with Giordano and Lindström (2011) and Lindström and Giordano (2016) who did not find for the whole UK population an association between being active in associations and indexes of self-rated psychological health obtained from GHQ-12.

The second point to underline is that the estimates of the parameters associated to $member_{it} * active_{it}$ are statistically significant in most of the GHQ-12 items with the exception of *loss of sleep* (ghqb), *constantly under strain* (ghqe), *problem overcoming difficulties* (ghqf) and *unhappy or depressed* (ghqi). Hence, being member and active rises the likelihood of declaring “better than usual” in the following “positive” item: *concentration* (ghqa) ($p < 0.01$), *playing a useful role* (ghqe) ($p < 0.001$), *capable of making decisions* (ghqd) ($p < 0.10$), *enjoy day-to-day activities* (ghqg) ($p < 0.001$), *ability to face problems* (ghqh) ($p < 0.001$) and *general happiness* (ghql) ($p < 0.05$). Moreover, being member and active decreases the probability of declaring “much more than usual” in the “negative” items: *losing confidence* (ghqj) ($p < 0.05$) and *believe in self-worth* (ghqk) ($p < 0.05$).

Table 3. Self-rated psychological health estimations: items from 1 to 6

	(1)	(2)	(3)	(4)	(5)	(6)
	ghqa	ghqb	ghqc	ghqd	ghqe	ghqf
Member	-0.064 (0.061)	0.043 (0.052)	-0.038 (0.058)	-0.067 (0.062)	0.044 (0.050)	0.006 (0.052)
Active	-0.149* (0.067)	0.113* (0.057)	-0.068 (0.066)	-0.028 (0.069)	0.086 (0.054)	0.004 (0.056)
Member*Active	-0.147** (0.048)	0.019 (0.042)	-0.153*** (0.046)	-0.086+ (0.049)	0.026 (0.040)	-0.033 (0.042)
C_age2	0.001+ (0.000)	-0.000 (0.000)	0.000 (0.000)	0.001+ (0.000)	-0.001*** (0.000)	-0.000 (0.000)
C_age	-0.020 (0.071)	-0.068 (0.060)	0.006 (0.000)	-0.094 (0.073)	0.034 (0.058)	0.075 (0.061)
Married	-0.205* (0.089)	-0.295*** (0.077)	-0.257*** (0.085)	0.034 (0.089)	-0.216** (0.076)	-0.239** (0.081)
hhsz	0.018 (0.029)	-0.030 (0.028)	-0.030 (0.029)	0.039 (0.030)	-0.020 (0.026)	-0.005 (0.027)
Children	0.009 (0.041)	-0.117** (0.036)	-0.052 (0.040)	-0.089* (0.041)	-0.014 (0.034)	-0.052 (0.035)
Degree	0.039 (0.268)	-0.153 (0.254)	0.010 (0.225)	-0.240 (0.238)	-0.279 (0.224)	-0.469* (0.233)
Hnd_a	0.004 (0.119)	-0.065 (0.102)	0.013 (0.110)	-0.089 (0.116)	-0.173+ (0.100)	-0.219* (0.102)
O_cse	-0.417* (0.184)	-0.081 (0.176)	-0.030 (0.195)	0.030 (0.176)	-0.246 (0.166)	-0.232 (0.170)
Lnincome	-0.049 (0.036)	-0.056+ (0.033)	0.083* (0.035)	0.031 (0.035)	-0.038 (0.030)	-0.034 (0.031)
Employed	-0.215* (0.089)	-0.135+ (0.081)	-0.713*** (0.090)	-0.461*** (0.092)	-0.111 (0.078)	-0.126 (0.081)
Unemployed	-0.060 (0.082)	-0.012 (0.074)	-0.025 (0.082)	-0.178* (0.085)	-0.073 (0.071)	0.070 (0.075)
Retired	-0.097 (0.118)	0.017 (0.100)	-0.000 (0.013)	-0.288* (0.128)	-0.302** (0.098)	-0.000 (0.013)
hl2gp	0.208*** (0.018)	0.141*** (0.015)	0.119*** (0.017)	0.161*** (0.018)	0.147*** (0.015)	0.119*** (0.017)
Region	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	45159	45142	45128	45162	45164	45150
Obs Buc	32873	47050	36307	30048	49536	45577
Individuals	5377	7189	5749	5070	7729	7298
pseudo <i>R</i> ²	0.013	0.012	0.015	0.012	0.009	0.010
<i>AIC</i>	24143.0	35228.5	26558.5	22013.9	37210.8	34188.1
<i>BIC</i>	24453.8	35552.6	26873.0	22321.4	37536.8	34511.0
ll	-12034.5	-17577.3	-13242.2	-10970.0	-18568.4	-17057.0
chi2	211.8	272.5	263.5	194.2	229.9	221.6

Notes: Standard errors in parenthesis and + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 4. Self-rated psychological health estimations: items from 7 to 12

	(7)	(8)	(9)	(10)	(11)	(12)
	ghqg	ghqh	ghqi	ghj	ghqk	ghql
Member	-0.040 (0.057)	-0.108 (0.066)	-0.034 (0.051)	-0.046 (0.054)	-0.128* (0.064)	-0.046 (0.059)
Active	-0.066 (0.062)	-0.050 (0.070)	0.047 (0.055)	0.027 (0.059)	0.060 (0.068)	-0.076 (0.061)
Member*Active	-0.154*** (0.046)	-0.175*** (0.051)	-0.029 (0.040)	-0.098* (0.044)	-0.103* (0.050)	-0.112* (0.046)
C_age2	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
C_age	-0.004 (0.065)	0.074 (0.076)	0.017 (0.059)	0.028 (0.063)	-0.045 (0.075)	-0.033 (0.067)
Married	-0.147+ (0.084)	-0.016 (0.095)	-0.360*** (0.077)	-0.377*** (0.084)	-0.337*** (0.098)	-0.314*** (0.083)
hhsz	0.012 (0.029)	0.024 (0.033)	-0.000 (0.026)	0.001 (0.029)	-0.019 (0.033)	-0.012 (0.028)
Children	-0.056 (0.039)	-0.061 (0.044)	-0.123*** (0.035)	-0.067+ (0.038)	-0.070 (0.044)	-0.060 (0.038)
Degree	0.095 (0.240)	0.122 (0.260)	-0.176 (0.229)	-0.086 (0.241)	0.248 (0.293)	-0.038 (0.234)
Hnd_a	-0.089 (0.110)	0.036 (0.120)	-0.095 (0.098)	-0.029 (0.107)	0.003 (0.123)	-0.003 (0.012)
O_cse	0.068 (0.173)	-0.086 (0.179)	-0.182 (0.159)	-0.361* (0.170)	0.187 (0.177)	0.037 (0.169)
Lnincome	0.028 (0.034)	-0.040 (0.039)	-0.051 (0.031)	-0.007 (0.033)	-0.062+ (0.037)	-0.002 (0.035)
Employed	-0.139+ (0.084)	-0.335*** (0.091)	-0.282*** (0.077)	-0.399*** (0.086)	-0.440*** (0.097)	-0.318*** (0.087)
Unemployed	0.011 (0.077)	0.002 (0.086)	-0.054 (0.071)	0.025 (0.079)	0.005 (0.088)	-0.069 (0.080)
Retired	-0.091 (0.112)	-0.097 (0.126)	-0.033 (0.101)	-0.043 (0.109)	0.016 (0.124)	-0.163 (0.124)
hl2gp	0.194*** (0.017)	0.136*** (0.019)	0.164*** (0.015)	0.144*** (0.016)	0.122*** (0.018)	0.100*** (0.017)
Region	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	45174	45177	45169	45162	45147	45177
Obs Buc	36810	28292	51030	43413	34567	35732
Individuals	5939	4674	7563	6709	5317	5776
pseudo <i>R</i> ²	0.012	0.010	0.014	0.013	0.012	0.007
<i>AIC</i>	27087.9	20654.8	38292.4	32430.4	25690.5	26345.3
<i>BIC</i>	27402.9	20960.1	38619.5	32751.5	26003.2	26650.8
ll	-13507.0	-10290.4	-19109.2	-16178.2	-12808.3	-13136.7
chi2	218.1	138.2	346.0	270.4	189.9	122.2

Notes: Notes: Standard errors in parenthesis and + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

5. Discussion

The aim of this longitudinal panel study was to analyse whether being a member, active, and member and active in associations in the UK has positive effect on self-rated psychological health over time using single items of the GHQ-12, ordered logit fixed effects models and controlling for socioeconomic characteristics.

Our first main evidences indicate marital and employment status increase psychological wellbeing. These results support previous research demonstrating that marriage and employment protect against worse psychological health over time (see Giordano and Lindström 2011; Lorant et al. 2003; Wyke and Ford 1992). Our results also indicate that education is only important in overcoming difficulties (ghqf) mirroring previous studies regarding socioeconomic status and mental health outcomes (Wang et al. 2010).

After considering socioeconomic characteristics, our findings on membership and active participation, with few exceptions, show no effect on single items of the GHQ-12. These evidences are in line with previous empirical investigations conducted on the UK with BHPS data (Giordano and Lindström 2011; Lindström and Giordano 2016)

Our original results add to the increasing volume of research demonstrating that being member and active in associations has a longitudinal positive effect on most items of the GHQ-12 psychological health. Our findings indicate that being member and active in associations affect health outcomes via psychological pathways.

These evidences are in line with the hypotheses according to which individual with strong structural social capital, i.e. with strong social ties in associations, are likely to have more promoting behaviours (*social influence*), stress reducing responses to challenging situations (*buffering effect*), sense of purpose, belonging and security (*social location*) and multiple resources based on their social relationships (*social integration*) that enable them to maintain better overall psychological health.

Indeed, being member and active increase the likelihood of declaring “better than usual” in concentration, playing a useful role, capable of making decisions, ability to face problems and decreasing the probability of reporting “much more than usual” in losing concentration and believe in self-worth. These findings highlight the protective role of structural social capital against poor psychological health outcomes.

References

- Ahnquist J., Wamala S. P., Lindstrom M. (2012). Social determinants of health – A question of social or economic capital? Interaction effects of socioeconomic factors on health outcomes. *Social Science & Medicine*, 74, 930-939.
- Almedom, A. M. (2005). Social capital and mental health: An interdisciplinary review of primary evidence. *Social Science & Medicine*, 61, 943-964.
- Baetschmann, G., Staub, K.E., Winkelmann, R. (2015). Consistent estimation of the fixed effects ordered logit model. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 178, 685-703.
- Bassett E., Moore, S. (2013). Social capital and depressive symptoms: The association of psychosocial and network dimensions of social capital with depressive symptoms in Montreal, Canada. *Social Science & Medicine*, 86, 96-102.
- Brown, S., Gray, D. (2015). Household finances and well-being in Australia: An empirical analysis of comparison effects. *Journal of Economic Psychology*, 53, 17-36.
- Brunner, E., Marmot, M., (1999). Social organization, stress, and health. In: Marmot, M., Wilkinson, R.G. (Eds.). *Social determinants of health*. Oxford: Oxford University Press, pp. 17–43.
- Bourdieu, P. (1980), Le capital social, *Actes de la Recherche en Sciences Sociales*, 31, 2-3.
- Bourdieu, P., Wacquant, L. (1992). *An Invitation to reflexive sociology*. Cambridge: Polity.
- Chamberlain, G. (1980). Analysis of covariance with qualitative data. *The Review of Economic Studies*, 47, 225-238.
- Chatterjee, S., Hadi, A.S. (2015). *Regression analysis by example*. John Wiley & Sons.
- Cohen, S., Underwood, L.G., Gottlieb, B.H. (2000). *Social support measurement and intervention. A guide for health and social scientists*. New York: Oxford University Press.
- Coleman, J. (1990), *Foundations of Social Theory*, Cambridge: Harvard University Press.
- Coleman, J. (1988), Social Capital in the Creation of Human Capital. *The American Journal of Sociology*, 94, S95-S120
- Craig, J. (2007). The general health questionnaire. *Occupational Medicine*, 57, 79.

- De Silva, M. J., McKenzie, K., Harpham, T., Huffy S. R.A. (2005). Social capital and mental illness: A systematic review. *Journal of Epidemiology and Community Health*, 59, 619-627.
- del Pilar Sánchez-López, M., Dresch, V. (2008). The 12-item general health questionnaire (GHQ-12): Reliability, external validity and factor structure in the Spanish population. *Psicothema*, 20, 839-843.
- Dickerson, A., Hole, A.R., Munford, L.A. (2014). The relationship between well-being and commuting revisited: Does the choice of methodology matter? *Regional Science and Urban Economics*, 49, 321-329.
- Ding, N., Berry, H. L., O'Brien L.V. (2015). One-year reciprocal relationship between community participation and mental wellbeing in Australia: A panel analysis. *Social Science & Medicine*, 128, 246-254.
- Fiorillo, D., Sabatini, S. (2011). Quality and quantity: The role of social interactions in self-reported individual health. *Social Science & Medicine*, 73, 1644-1652.
- Frijters, P., Beaton, T. (2012). The mystery of the U-shaped relationship between happiness and age. *Journal of Economic Behavior & Organization*, 82, 525-542.
- Fujiwara, T., Kawachi, I. (2008). A prospective study of individual-level social capital and major depression in the United States. *Journal of Epidemiology and Community Health*, 62, 627-633.
- Geishecker, I., Riedl, M., Frijters, P. (2012). Offshoring and job loss fears: An econometric analysis of individual perceptions. *Labour Economics*, 19, 738-747.
- Giordano, G.N., Lindström, M. (2010). The impact of changes in different aspects of social capital and material conditions on self-rated health over time: A longitudinal cohort study. *Social Science & Medicine*, 70, 700-710.
- Giordano, G.N., Lindström, M. (2011). Social capital and change in psychological health over time. *Social Science & Medicine*, 72, 1219-1227.
- Giordano, G.N., Björk, J., Lindström, M. (2012). Social capital and self-rated health – a study of temporal (casual) relationships. *Social Science & Medicine*, 75, 340-348.
- Golderberg, D., Williams, P. (1988). *A user's guide to the general health questionnaire*. NFER-Nelson, Windsor, UK.

- Han, S. (2015). Longitudinal association between social capital and self-esteem: A matter of context. *Psychiatry Research*, 226, 340-346.
- Harpham, T., Grant, E., Thomas, E. (2002) . Measuring social capital within health surveys: Key issues. *Health Policy and Planning*, 17,106–111.
- Henderson, S., Whiteford, H. (2003). Social capital and mental health. *Lancet*, 362, 505-506.
- Hu, Y., Stewart-Brown, S., Twigg, L., Weich, S. (2007). Can the 12-item general health questionnaire be used to measure positive mental health? *Psychological Medicine*, 37, 1005-1013.
- Islam M. K., Gerdtham U., Gullberg B., Lindström M., Merlo J., (2008), Social capital externalities and mortality in Sweden. *Economics & Human Biology*, 6, 19-42.
- Kawachi I., (2006), Commentary: social capital and health: making the connections one step at the time. *International Journal of Epidemiology*, 35, 989-993.
- Kawachi I., Berkman L. F. (2001). Social ties and mental health. *Journal of Urban Health*, 78, 458-467.
- Lin, N, Ye, X, Ensel, W. M. (1999). Social support and depressed mood: A structural analysis. *Journal of Health and Social Behavior*, 40(4), 344-59.
- Lindström M. (2004). Social capital, the miniaturisation of community and self-reported global and psychological health. *Social Science & Medicine*, 59, 595-607.
- Lindström M., Giordano, G.N. (2016). The 2008 financial crisis: Changes in social capital and its association with psychological wellbeing in the United Kingdom – A panel study. *Social Science & Medicine*, 153, 71-80.
- Lindström, M., Mohseni, M. (2009). Social capital, political trust and self-reported psychological health: A population based study. *Social Science & Medicine*, 68, 436-443.
- Lorant, V., Deliège, D., Eaton, W., Robert, A., Philippot, P., Anseau, M. (2003). Socioeconomic inequalities in depression: A meta-analysis, *American Journal of Epidemiology*, 157, 98-112.
- Lordan, G., Pakrashi, D. (2014). Make time for physical activity or you may spend more time sick! *Social Indicators Research*, 119, 1379-1391.

- McCulloch A. (2001). Social environments and health: cross sectional national survey. *BMJ*, 232, 308-309.
- McKenzie, K., Whitley R., Weich, S. (2002). Social capital and mental health. *British Journal of Psychiatry*, 181, 280-283.
- Mujcic, R., Frijters, P. (2015). Conspicuous consumption, conspicuous health, and optimal taxation. *Journal of Economic Behavior & Organization*, 111, 59-70.
- Murayama, H., Fujiwara, Y., Kawachi, I. (2012). Social capital and health: A review of prospective multilevel studies. *Journal of Epidemiology*, 22, 179-187.
- Phongsavan, P., Chey, T., Bauman, A., Brooks, R., Silove, D. (2006). Social capital, socio-economic status and psychological distress among Australian adults. *Social Science & Medicine*, 63, 2546-2561.
- Portes A., (1998), Social capital: its origins and applications in modern sociology. *Annual Review of Sociology*, 24, 1-24.
- Poortinga, W. (2006b). Social relations or social capital? Individual and community health effects of bonding social capital. *Social Science & Medicine*, 63, 255–270.
- Poortinga, W. (2006a). Social capital: an individual or collective resource for health? *Social Science & Medicine*, 623, 292–3020.
- Putnam, R.D., Leonardi, R., Nanetti, R.Y. (1993). *Making democracy work: Civic traditions in modern Italy*. Princeton University Press, Princeton.
- Putnam, R.D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy*, 6 (1), 65–78.
- Radloff, L.S. (1977). The CES-D scale: A self-reported depression scale for research in general population. *Applied Psychological Measurement*, 1, 385.
- Riedl, M., Geishecker, I. (2014). Keep it simple: estimation strategies for ordered response models with fixed effects. *Journal of Applied Statistics*, 41, 2358-2374.
- Schultz, J., O'Brien, A. M., Tadesse, B. (2008). Social capital and self-rated health: Results from US 2006 social capital survey of one community. *Social Science & Medicine*, 67, 606-617.

Uphoff, N. (1999). Understanding social capital: learning from the analysis and experience of participation. In: Dasgupta, P., Serageldin, I. (Eds.), *Social Capital: A Multifaceted Perspective*, The World Bank, Washington, DC.

Wang, J. L., Scmitz, N., Dewa, C. S. (2010). Socioeconomic status and the risk of major depression: The Canadian national population health survey, *Jornal of Epidemiology and Community Health*, 64, 447-452.

Wyke, S., Ford, G. (1992). Competing explanations for associations between marital status and health, *Social Science & Medicine*, 34, 523-532.