Social Interaction and Labour Market Outcomes

Xin, Guangyi

University of Leicester

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Guangyi Xin[1]

University of Leicester

Abstract

This paper studies the effect of social interaction on employment status and employment quality by using longitudinal data from BHPS (British Household Panel Survey). Active community membership is employed as the measurement of social Interaction. Various identification strategies provide robust evidence that a higher level of social interaction results in increased probability of being full-time employed. The effect of social interaction on employment status is also investigated among different gender groups and at different age stages. Moreover, three indices of social interaction have been constructed to capture the different dimension effect of social interaction on labour market outcome. As a result, active group memberships in professional organisations and sport clubs have the largest effect. Regarding employment quality, social interaction leads to a positive and significant effect on wages. This social interaction effect is also studied among different gender and occupation groups.

Keywords: Social Capital; Social Interaction; Labour Market Outcome

JEL Classification: J64; J21; J31; L14

[1] Address: School of Business, Division of Economics, University of Leicester, Astley Clarke Building, University Road, Leicester LE1 7RH, UK. Email: gx7@le.ac.uk

1 Introduction

Social interaction has been viewed as an important information resource in the job searching process. According to the 2004 Spring Report of the UK Labour Force Survey, approximately 30% of individuals who start their jobs over the previous three months learned about the job from social acquaintances who used to work for the employer. A number of early studies emphasise the important information transmission function of social interaction for job seekers (Montgomery 1991; Granovetter 1995; Ioannides and Loury 2004).

Social interactions might influence an individual's labour market outcomes through various mechanisms.

First, an individual's cognitions about the value of spending time in a job or out of a job are impacted by his or her surrounding social networks. Earlier theoretical studies suggest that the better the employment status of an individual's connections, the better his or her employment prospects (Calvo-Armengol 2004; Calvo-Armengol and Jackson 2004; Bramoulle and Saint-Paul 2010). Cappellari and Tatsiramos (2015) also empirically illustrate that a high employment rate in a person's social network would lead to a higher probability of that individual entering the job market. However, some researchers such as Cox (1997) and Portes (1998) note that some types of social interactions might induce negatively affect the labour market supply. Specifically, some individuals may be surrounded by social networks in which the social norm is being out of the job market. The individual could join non-work ethnic organisations. In addition, an intergenerational welfare system may demotivate some individuals to actively join the labour market, as is occurring in the United States (Murray 1994).

Second, from the labour demand perspective, employers always treat a potential employee endowed with rich social networks more favourably. This preference is mainly because those rich social networks would enhance one's productivity in the workplace, which will benefit the firm. Holzer (1988) claims that referrals from employees have always been used as a cheap screening and signalling device for the employer and that employers believe they can get more information from referrals

than direct applications. Rees (1966) defends the notion that only competent staff would be recommended to the employer from the existing employee since the existing employee does not want to affect his or her own reputation with the employer. The empirical evidence of employers focusing more on potential employees with higher social capital has been found in some European countries (Barbieri *et al*. 1999).

Finally, job information through social interactions can qualify the job searching process by relaying information about job opportunities to potential job seekers and conveying information about an employee's productivity and the quality of the work-job match. The job searching process is complicated by the asymmetric information between employees and employers. With the coordination of social interaction, the job searching process could be more efficient and effective (Stone *et al.* 2003). Similarly, Burt (1992) suggests that social ties could effectively encourage the mobility of individuals and the sharing of knowledge. Using a theoretical model, Calvo-Armengol and Zenou (2005) illustrate that social networks indeed impact an individual's economic success. In their paper, they emphasise that social networks can help to spread job information within one's social groups and can be a useful complementary method to formal job searches.

Essentially, social interactions can effectively reduce the job search cost and promote coordination between potential employees and employers, which can eventually prompt a suitable job match. Nevertheless, the empirical studies of the influence of social interactions on labour market outcomes are very rare. Aguilera (2002) explores the correlation between social interactions expressed by friendship ties and labour force participation represented as employment and hours worked based on the 2000 Social Capital Benchmark Survey. He suggests that social interaction is generally positively associated with increased job market participation. Stone *et al.* (2003) investigate how the social interactions with family, friends and civic ties affect an individual's labour market outcomes in a survey sample of 1500 Australians. Cappellari and Tatsiramos (2015) examine the social network effect on job finding rates and job match quality based on the British Household Panel Survey (BHPS) by using the employment of friendship ties as the social network proxy.

The above literature stresses how social interactions with strong ties (such as within families and close friends) facilitate the individual's labour market outcomes.

However, an earlier study of Granovetter (1973), who raises the hypothesis of "the strength of weak ties", suggests that the "cohesive power of weak ties" plays a significant role in facilitating information diffusion, social mobility and community organisations. Kavanaugh *et.al* (2007) also demonstrate that weak ties among people across groups lead to higher levels of collective efficacy. Furthermore, it has been argued that having weak ties can effectively accelerate knowledge sharing within an organisation. (Constant *et al*. 1996; Hansen 1999; Levin and Cross 2003) In terms of the labour market, Montgomery (1992) uses a theory model to claim that weak ties can be more effective in labour market outcomes since job information offered from weak ties is more frequent than information offered by strong ties, meaning that weak ties have better job information distribution.

In this paper, I focus on the influence of social interactions among weak ties. Specifically, the social interaction index is proxied by active group membership, which counts the sum number of groups in which individuals currently are active based on their responses to a series of survey questions about a range of groups from the British Household Panel Survey (BHPS). In previous studies, researchers use the level of civic engagement and group membership as measures of social interactions (Narayan and Pritchett 1999; Glaeser *et al*. 2002; Stone *et al*. 2003). However, they did not consider the intensity of each individual's participation in the organisation.

Substantial evidence (Healy and Cote 2001) reveals that social capital can be easily achieved in the process of joining and interacting in organisations. These organisations could be sports groups, environmental groups or religious groups. These groups can help to mitigate the social distance between members; furthermore, trust, loyalty, altruism and cooperation can gradually emerge within them. Information will also flow within the groups, which could benefit the members.

The main goal of this chapter is to examine the effect of social interactions on individuals' employment status. I also investigate how this social interaction effect can be heterogeneous for different gender groups and at different ages. Moreover, I build three social interaction indices (each reflecting active group membership in certain type of groups) to explore how the social interactions embedded in different set of groups have different effects on labour market outcomes. Furthermore, I extend my study by measuring the effect of social interactions on wages. In addition, I capture

the difference in this effect for different gender groups as well as different types of occupations.

The remainder of this paper is organised as follows. Sections 2 and 3 describe the data and identification strategies, respectively. Section 4 covers the main results of the influences of social interactions on individuals' labour market outcomes. Section 5 presents the three social interaction indices and how these indices relate to an individual's employment status. The influence of social interaction on wages is addressed in section 6. Section 7 offers the conclusion, which summarises the main findings and limitations.

2 Data and descriptive statistics

2.1 Data

To examine how social interactions and labour market outcomes are related, I exploit longitudinal data from the British Household Panel Survey (BHPS). The BHPS is an annual panel survey covering various aspects of an individual's life including measures that broadly constitute social interactions and labour market outcomes. The BHPS is conducted by the Institute for Social and Economic Research and comprises a cross-section of approximately 10,000 British households drawn from 250 areas of Great Britain beginning in 1991.

The social interaction index (active group membership) is gathered from the BHPS questionnaire section named "social and interest group activity". Survey participants are asked to report information about whether they are active in a list of groups. The groups in this survey are as follows: political parties, trade unions, environmental groups, parents' associations, tenants'/residents' groups, religious groups, voluntary service groups, pensioner organisations, Scout/Guides organisations, other community groups, other social groups, sport clubs, women's institutes, professional organisations, and any other groups. The social interaction index is the sum of the number of groups in which an individual is active and ranges from 0 to 9.

Furthermore, I construct three other social interaction indices to capture the different sets of the aforementioned groups in which individuals are active, and I then

explore how these three indices affect an individual's job market outcomes. Methodologically, principal component analysis (PCA) is applied to produce the three indices based on the correlation of the distribution of each active group membership throughout the sample.

Since the BHPS is a longitudinal dataset, the impact of social interaction on job market outcomes can be measured over an individual's lifetime. The BHPS provides information in "social and interest group activity" surveys in waves 1-5, 7, 9, 11, 13, 15, and 17. However, some groups, such as professional organisation, pensioners organisations and Scout/Guides organisations, are excluded in the first two surveys and were thus not introduced until wave 3. Since I focus on job market outcomes, I choose respondents aged 18-65 who are not in full-time education at waves 3-5, 7, 9, 11, 13, 15, and 17 as my sample.

Given the previous selection criteria, I use 71,082 observations. Among these, approximately 94% of the respondents are employed; approximately 80% of those are full-time workers and 20% are part-time workers. Among the part-time workers, more than 87% are female. I only concentrate on whether social interactions can influence the probability of being a full-time worker. After dropping the part-time workers, I have a sample of 54,405 observations. I consider an individual's employment status as the outcome rather than his or her transition status from unemployed to employed. I have two reasons for this approach. First, focusing on the transition will significantly reduce the sample, given that the majority of the respondents are employed. Second, concentrating on the transition from unemployment to employment will potentially generate endogeneity issues due to unobserved heterogeneity. Indeed, as Heckman (1981) notes, the issue of initial conditions[2] can arise since being non-employed can be serially correlated with the employment process.

2.2 Descriptive statistics

Appendix 1 presents the sample's summary statistics. First, I report statistics concerning the employment status of the respondents. The full sample consists of 54,405 observations. Of those observations, approximately 93.4% are in full-time

[2] If the error terms are serially correlated, the initial conditions would not exogenous.

employment. The remaining 6.6% of observations are unemployed. The mean age of the respondents in this sample is approximately 38 years old, and 38.5% of participants are females. I also report respondents' characteristics such as ethnicity, education level, family structure, health, and region of residence. The social interaction index of the full sample is 0.691 on average. The sports clubs have the highest average active membership (0.229). They are followed by social groups with an average active membership of 0.091, which suggests that approximately 9% of respondents in the sample are involved in a social group. Note that the average level of social interactions 0.708 for employed individuals and 0.464 for unemployed ones. This is perhaps the first indication of a link between the extent of social interactions and employment status – a link that I will explain systematically by means of the joined econometric approach that I summarise below.

3 Methodology

The correlation between social interaction and employment status will be investigated by means of the following econometric model:

$$Y_{i,t} = F\left(X_{i,t}, SI_{i,t}\right) \quad (1)$$

where $Y_{i,t}$ stands for the individual i's employment status at time t, which is a binary variable. It takes the value one if the individual is in paid full-time employment and zero otherwise. The variable $SI_{i,t}$ represents the social interaction index for individual i at time t. The vector $X_{i,t}$ summarises the individual characteristics that would affect the probability of having full-time employment for individual i at time t. These characteristics include age, age squared, splines of six education levels (higher degree, 1st degree, hnc, a level, o level, cse), and dummies for gender, race, current marital status, having a child, health status and region of residence. The time variable t takes year values 1993, 1994, 1995, 1997, 1999, 2001, 2003, 2005, and 2007. F (.) denotes the function form, which can be either linear or logistic.

The main identification issue is the potential endogeneity of social interactions. Since the active group memberships of each respondent are not randomly assigned, some unobserved individual characteristics affecting the individual's active group memberships might also determine his or her employment status; therefore,

endogeneity may arise. For example, a sociable individual (unobserved individual characteristic) who might have a higher probability of being employed could also have more active group memberships. This would result in an upwardly biased social interaction effect. This also has the potential for reverse causality between social interaction and an individual's job market prospects. Therefore, I use the fixed effects estimation to eliminate unobserved individual heterogeneity bias. Additionally, the instrumental variable approach is applied to solve the issue of reverse causality by employing an average level of social interaction among a population with the same occupation who live in the same region and respond to the survey in the same year as the instrumental variable of the social interaction index.

3.1 Logistic estimator

Since the dependent variable is a binary variable, the typical method of logistic estimation is applied in the following function form:

$$Y_{i,t} = \frac{\exp\left(X_{i,t}, SI_{i,t}\right)}{1+\exp\left(X_{i,t}, SI_{i,t}\right)} \quad (2)$$

where exp stands for the exponential form. The specifications of $SI_{i,t}$ and $X_{i,t}$ are the same as those used in equation (1). However, a logistic estimation cannot effectively address endogeneity issues that are a result of unobserved heterogeneity and potential reverse causality. The conditional logistic model is used to eliminate unobserved heterogeneity, while this procedure captures the social interaction effect on employment transition rather than employment status.

3.2 Fixed effects estimator

To address unobserved heterogeneity, I apply the fixed effects estimation method. The data sample contains 54,405 observations of 13,071 individuals who participated in the survey for more than one wave, which can help to capture the within-individual variation in social interaction over time and across different respondents. At the same time, this approach can effectively eliminate time-invariant unobserved heterogeneity, which might be correlated with individual social interactions. To apply the fixed effects estimation, I employ the following estimation equation:

$$Y_{i,t} = \alpha + \beta X_{i,t} + \gamma SI_{i,t} + a_i + \varepsilon_{i,t} \quad (3)$$

where $\varepsilon_{i,t}$ is the idiosyncratic error term and should be uncorrelated with each explanatory variable across all time periods. Additionally, $\varepsilon_{i,t}$ is homoscedastic and serially uncorrelated. The term a_i captures the unobserved effect that describes unobserved heterogeneity characteristics influencing the individual *i*'s employment status. The specification of $X_{i,t}$ and $SI_{i,t}$ are again the same as those explained in equation (1).

3.3 Instrumental variables (IV) estimator

The fixed effects estimator can be biased if the social interaction index is not strictly exogenous and depends on past values of the dependent variable, such as $SI_{i,t}$ being affected by $Y_{i,t}$ and/or $Y_{i,t-1}$. To address the endogeneity problem for $SI_{i,t}$, the average value of social interaction for the endogenous variable is considered to be the instrumental variable. For example, $\widetilde{SI_{\iota,t}}$ can be the instrumental variable for $SI_{i,t}$, and $\widetilde{SI_{\iota,t}}$ is estimated by averaging the social interaction level of the population who live in the same region, work in the same occupation and respond to the survey questions in the same year.

There are two critical conditions that must be met for a variable to be considered a valid instrumental variable. First, the instrumental variable must be correlated with the endogenous variable ($SI_{i,t}$). Second, the instrumental variable must not be correlated with the dependent variable ($Y_{i,t}$) or the error term ($\varepsilon_{i,t}$). Here, it is apparent that $\widetilde{SI_{\iota,t}}$ is correlated with $SI_{i,t}$. The only issue is verifying that $\widetilde{SI_{\iota,t}}$ is uncorrelated with $Y_{i,t}$ or $\varepsilon_{i,t}$, even though an individual's current employment status $Y_{i,t}$ might affect his or her current social interaction level $SI_{i,t}$. The occupational regional average level of social interaction cannot possibly be decided by one's employment status. Therefore, $\widetilde{SI_{\iota,t}}$ is a valid instrumental variable for $SI_{i,t}$. The econometric model for applying the instrumental variable can be written as:

First stage:

$$\widehat{SI}_{i,t} = \alpha' + \beta' x_{i,t} + \gamma' \widetilde{SI_{\iota,t}} + a_i' + \vartheta_{i,t} \quad (5)$$

And the second stage:

$$Y_{i,t} = \alpha + \beta x_{i,t} + \gamma \widehat{SI}_{i,t} + a_i + \mu_{i,t} \quad (6)$$

where ϑ, μ are composite error terms that are uncorrelated with $x_{i,t}, \widehat{SI}_{i,t}$.

4 Estimation results

This section formally presents the results of the empirical investigation. Furthermore, it extends the analysis by investigating the possibility of heterogeneous social interaction effects according gender difference as well as differences in an individual's stage of life. This is justified because the type of organisations that women prefer to join could be very different than those that men join. Similarly, an individual would prefer to join different organisations at different ages according to their preferences and needs. Therefore, the social interaction effect could be heterogeneous for different gender groups and at different ages.

4.1 Logistic estimator

Regarding the binary dependent variable model, I begin with the logistic estimation to investigate the social interaction effect on labour market participation. The first column of Table 1.A shows that social interaction is positively and significantly associated with being employed full time. The second column implies that an additional active group membership results in a 1.1% higher probability of being engaged in full-time employment[3]. The coefficients of the conditional logistic and the conditional logit margins models are positive yet not statistically significant. Nevertheless, the coefficients of these two models capture the influence of social interaction on the individuals who undergo employment transition, which means that the social interaction effect is positively related to the probability of transitioning from unemployment to employment for an individual but is not statistically significant.

[3] The estimation results from the logistic model only suggest the direction of the correlation between employment status and all the controls, while the estimation results from logistic margins reveal not only the direction but also the magnitude of the effect.

Table 1. A. Correlation between social interaction and employment status in the nonlinear model

	(1) Logistic model	(2) Logistic margins	(3) Conditional logit model	(4) Conditional logit margins
Social interaction	0.231***	0.011***	0.025	0.00002
	(0.026)	(0.001)	(0.048)	(0.000048)
Age	0.171***	0.008***	0.381***	0.00035
	(0.011)	(0.001)	(0.032)	(0.00024)
Age2	-0.002***	-0.000***	-0.004***	-3.68e-06
	(0.000)	(0.000)	(0.000)	(2.53e-06)
Higher degree	1.542***	0.041***	1.131	0.001
	(0.146)	(0.002)	(0.877)	(0.001)
1st degree	1.425***	0.045***	-0.116	-0.0001
	(0.074)	(0.002)	(0.549)	(0.0005)
Hnd, hnc,	1.318***	0.040***	0.347	0.0003
teaching	(0.088)	(0.002)	(0.553)	(0.0005)
A level	1.320***	0.047***	0.406	0.0003
	(0.059)	(0.002)	(0.426)	(0.0004)
O level	1.048***	0.042***	0.494	0.0004
	(0.051)	(0.002)	(0.447)	(0.0004)
Cse	0.806***	0.028***	0.014	0.00001
	(0.077)	(0.002)	(0.734)	(0.0006)
Married	0.938***	0.055***	0.390***	0.0003
	(0.045)	(0.003)	(0.116)	(0.0003)
Ethnic	0.671***	0.043***		
	(0.087)	(0.007)		
Anychild	-0.537***	-0.028***	-0.361***	-0.0003***
	(0.049)	(0.003)	(0.117)	(0.0002)
Female	0.191***	0.009***		
	(0.039)	(0.002)		
Region	-0.016	-0.001	-0.245*	-0.0002
	(0.013)	(0.001)	(0.139)	(0.0003)
Health	-0.975***	-0.070***	-0.616***	-0.0006
	(0.066)	(0.007)	(0.139)	(0.0004)
Sample Size	49227	49227	6857	6857
LR chi2	2280.104		291.106	
prob > chi2	0.000		0.000	

* p<0.10, ** p<0.05, *** p<0.01

Notes: The time periods of the sample are 1993-1995, 1997, 1999, 2001, 2003, 2005, and 2007. The dependent variable is employment status, which takes a value of one if the individual is engaged in paid full-time employment and zero otherwise. Social interaction is proxied by active group membership. Age represents the respondent's age. Higher degree, 1st degree, Hnc, A level, O level, and Cse are all dummy variables that represent the six levels of education. Married is a dummy variable that indicates one's marriage status. Ethnic is a dummy variable that takes a value of one if the individual is white and zero otherwise. Anychild and Female are dummy variables that indicate whether the respondent has a child or not and whether the respondent is female or not. Region represents the respondent's region of residence, which takes the value 1 (London), 2 (S England), 3 (N England), 4 (Wales), 5 (Scotland), or 6 (N Ireland). Health is a dummy variable and represents the health status of the respondent. It takes a value of one if the individual is currently experiencing anxiety and depression when answering the survey and zero otherwise.

4.2 Fixed effects estimator

As discussed, the fixed effects estimation model is adopted to address the endogeneity of the social interaction effect in order to eliminate the potential correlation with unobserved heterogeneity. Table 1.B illustrates how the social interaction and other control variables affect the likelihood of having full-time employment. In addition, Table 2 shows how the coefficients vary for male and female workers separately. Moreover, Table 3 describes the lifecycle effect of social interaction on the possibility of being employed full-time.

Once I control for unobserved heterogeneity, the estimated coefficient of social interaction drops from 0.01 (pooled OLS) to 0.001 (fixed effects). Here, 0.001 means that one additional unit improvement of social interaction leads to the probability of the respondents being employed full-time increasing by 0.1%. As some unobserved individual characteristics could determine both an individual's group membership profiles and employment status, it is unsurprising that the pooled OLS estimator is much bigger than the one obtained from the linear fixed effects estimation. According to the results from the pooled OLS and the fixed effects estimations, it can be concluded that a better social interaction level will lead to a higher probability of labour market participants obtaining full-time jobs.

All the estimated coefficients of other non-social interaction control variables are consistent with the theoretical predictions and existing empirical findings (Chapman *et al.* 2001; Birch 2002). As shown in the second column of Table 1.B, age is positively related to the possibility of being employed full time, while the square of age is negatively (the value is close to 0) related to the probability of being employed full time. This implies that the probability of having employment increases with working experience at a decreasing rate. Different education levels, ranging from secondary education to higher education, show different strengths of association with being employed full time. In general, higher levels of education are more strongly associated with being employed, with higher degrees having the strongest effect (4.6%) and lower secondary education qualification (CSE) having the weakest (-1.8%). People who are married are more likely to be employed. However, having children or having health problems are negatively associated with full-time employment.

To control for heterogeneous gender effects, I explore the impact of social interaction on labour market status for different gender groups. The estimation results are shown in Table 2. The coefficients of social interaction from a pooled OLS approach reveals that increased social interaction is associated with the increased probability of being employed for both males and females. Specifically, a one unit increase in social interaction results in a 1% and 1.1% higher possibility of having full-time employment for each individual, which is statistically significant. However, the coefficients of social interaction from the fixed effects estimation are statistically not significant, which suggests that social interaction does not affect the labour market outcome if we consider the female and male groups separately. Regarding the other control variables, the fixed effects estimator reveals that education levels play a more important role in being employed for males. Married men are also more likely to be employed (within the male group) than married women (within the female group). The remaining control variables play similar roles in both gender groups.

To investigate the effect of social interactions on labour market outcomes at different stages of the lifecycle, I divide the sample into different age groups: age 18-24, age 25-29, age 30-34, age 35-39, age 40-44, age 45-49, age 50-54 and age 55-65. In Table 3[4], the estimators from pooled OLS models reveal that the positive correlation between social interaction and the probability of having full-time employment is generally statistically significant. The fixed effects estimators also show the various social interaction effects for different age groups. The coefficients reveal that the effect of social interaction is positively related to the possibility of being employed when the individual is at age 30-34, age 40-44 and age 50-54 and that this effect is not statistically significant. For the other age groups, the fixed effects coefficients illustrate the negative (yet generally not significant) influence of social interaction on individuals' employment status. Notably, at age 55-65, the fixed effects estimator shows that social interaction and individual labour market outcome are negatively related and statistically significant. This could be because individuals are surrounded by the retired networks which spread the idea of retirement in this age group.

[4] The full regression results can be checked in Appendix 2.

Table 1. B. Correlation between social interaction and employment status in the linear model

	(1) Pooled OLS	(2) FE	(3) FEIV
Social interaction	0.010***	0.001	0.347***
	(0.001)	(0.001)	(0.018)
Age	0.012***	0.016***	0.015***
	(0.001)	(0.001)	(0.002)
Age2	-0.0001***	-0.0002***	-0.0001***
	(0.000)	(0.000)	(0.000)
Higher degree	0.100***	0.046*	-0.000
	(0.007)	(0.024)	(0.040)
1st degree	0.099***	0.022	-0.009
	(0.004)	(0.019)	(0.032)
Hnd, hnc,	0.092***	0.037*	0.041
teaching	(0.005)	(0.021)	(0.034)
A level	0.094***	0.042**	0.067**
	(0.004)	(0.017)	(0.029)
O level	0.080***	0.038**	0.024
	(0.003)	(0.017)	(0.029)
Cse	0.063***	-0.018	-0.014
	(0.005)	(0.029)	(0.048)
Married	0.060***	0.014***	0.036***
	(0.003)	(0.004)	(0.007)
Ethnic	0.052***		
	(0.006)		
Anychild	-0.030***	-0.014***	-0.033***
	(0.003)	(0.003)	(0.006)
Female	0.011***		
	(0.002)		
Region	-0.001	-0.014***	-0.020**
	(0.001)	(0.005)	(0.008)
Health	-0.083***	-0.027***	-0.023**
	(0.005)	(0.006)	(0.009)
Constant	0.525***	0.597***	0.335***
	(0.015)	(0.029)	(0.050)
Sample Size	49227	49227	50375
r-square	0.050	0.025	0.016

* p<0.10, ** p<0.05, *** p<0.01

Notes: The time periods of the sample are 1993-1995, 1997, 1999, 2001, 2003, 2005, and 2007. The dependent variable is employment status, which takes a value of one if the individual is engaged in paid full-time employment and zero otherwise. Social interaction is proxied by active group membership. Age represents the respondent's age. Higher degree, 1st degree, Hnc, A level, O level, and Cse are all dummy variables that represent the six levels of education. Married is a dummy variable that indicates one's marriage status. Ethnic is a dummy variable that takes a value of one if the individual is white and zero otherwise. Anychild and Female are dummy variables that indicate whether the respondent has a child or not and whether the respondent is female or not. Region represents the respondent's region of residence, which takes the value 1 (London), 2 (S England), 3 (N England), 4 (Wales), 5 (Scotland), or 6 (N Ireland). Health is a dummy variable and represents the health status of the respondent. It takes a value of one if the individual is currently experiencing anxiety and depression when answering the survey and zero otherwise.

Table 2. Correlation between social interaction and employment status for different gender

	(1) Pooled OLS female	(2) Pooled OLS male	(3) Fe female	(4) Fe male	(5) Feiv female	(6) Feiv male
Social interaction	0.010***	0.011***	0.003	-0.001	0.409***	0.311***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.034)	(0.021)
Age	0.012***	0.013***	0.013***	0.019***	0.012***	0.017***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.003)	(0.002)
Age2	-0.0001***	-0.0001***	-0.0002***	-0.0002***	-0.0001**	-0.0001***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00004)	(0.00002)
Higher degree	0.090***	0.104***	0.027	0.070**	-0.061	0.044
	(0.010)	(0.008)	(0.036)	(0.032)	(0.069)	(0.050)
1st degree	0.086***	0.104***	-0.008	0.051*	-0.075	0.043
	(0.006)	(0.005)	(0.028)	(0.027)	(0.054)	(0.041)
Hnd, hnc, teaching	0.077***	0.100***	-0.015	0.088***	-0.049	0.115***
	(0.008)	(0.006)	(0.030)	(0.028)	(0.057)	(0.043)
A level	0.081***	0.100***	-0.012	0.085***	0.015	0.107***
	(0.006)	(0.005)	(0.025)	(0.023)	(0.049)	(0.036)
O level	0.070***	0.085***	0.003	0.067***	-0.021	0.055
	(0.005)	(0.004)	(0.025)	(0.024)	(0.047)	(0.036)
Cse	0.046***	0.071***	-0.187***	0.090**	-0.111	0.061
	(0.009)	(0.007)	(0.045)	(0.038)	(0.086)	(0.058)
Married	0.049***	0.068***	0.007	0.019***	0.020*	0.044***
	(0.004)	(0.004)	(0.006)	(0.005)	(0.011)	(0.008)
Ethnic	0.053***	0.050***				
	(0.010)	(0.008)				
Anychild	-0.038***	-0.029***	-0.020***	-0.013***	-0.058***	-0.026***
	(0.004)	(0.004)	(0.006)	(0.004)	(0.011)	(0.007)
Region	0.001	-0.002**	-0.008	-0.019***	-0.005	-0.030***
	(0.001)	(0.001)	(0.008)	(0.006)	(0.015)	(0.010)
Health	-0.066***	-0.105***	-0.018**	-0.038***	-0.007	-0.040***
	(0.007)	(0.008)	(0.007)	(0.008)	(0.014)	(0.013)
Constant	0.560***	0.506***	0.728***	0.512***	0.404***	0.283***
	(0.024)	(0.019)	(0.046)	(0.037)	(0.092)	(0.059)
Sample Size	19146	30081	19146	30081	19602	30773
population size			5398	6599	5614	6906
r-square	0.042	0.056	0.006	0.041	0.009	0.028

* p<0.10, ** p<0.05, *** p<0.01

Notes: The time periods of the sample are 1993-1995, 1997, 1999, 2001, 2003, 2005, and 2007. The dependent variable is employment status, which takes a value of one if the individual is engaged in paid full-time employment and zero otherwise. Social interaction is proxied by active group membership. Age represents the respondent's age. Higher degree, 1st degree, Hnc, A level, O level, and Cse are all dummy variables that represent the six levels of education. Married is a dummy variable that indicates one's marriage status. Ethnic is a dummy variable that takes a value of one if the individual is white and zero otherwise. Anychild and Female are dummy variables that indicate whether the respondent has a child or not and whether the respondent is female or not. Region represents the respondent's region of residence, which takes the value 1 (London), 2 (S England), 3 (N England), 4 (Wales), 5 (Scotland), or 6 (N Ireland). Health is a dummy variable and represents the health status of the respondent. It takes a value of one if the individual is currently experiencing anxiety and depression when answering the survey and zero otherwise.

Table 3. Correlation between social interaction and employment status at different age stage by pooled OLS regression model

	(1) Pooled OLS	(2) Fixed effects	(3) Fixed effect IV
Age 18-24	0.030***	-0.002	1.389***
	(0.006)	(0.009)	(0.309)
Age 25-29	0.010**	-0.007	0.790***
	(0.004)	(0.006)	(0.249)
Age 30-34	0.009***	0.002	0.240***
	(0.003)	(0.004)	(0.054)
Age 35-39	0.009***	-0.002	0.117***
	(0.003)	(0.003)	(0.026)
Age 40-44	0.012***	0.005	0.202***
	(0.003)	(0.004)	(0.037)
Age 45-49	0.008***	-0.002	0.234***
	(0.003)	(0.003)	(0.045)
Age 50-54	0.013***	0.007	0.248***
	(0.003)	(0.005)	(0.040)
Age 55-65	0.003	-0.007*	0.326***
	(0.004)	(0.004)	(0.084)

* p<0.10, ** p<0.05, *** p<0.01.

4.3 IV estimator

The third approach to investigating the correlation between social interaction and employment status is the fixed effects instrumental variable (IV) estimation. As discussed in section 3.3, the estimation results can suffer from a potential endogeneity problem. I address this issue by using the average level of social interaction ($\widetilde{SI_{i,t}}$) as the instrumental variable to instrumentalise the endogenous social interaction index ($SI_{i,t}$). Unlike the previous approaches, the fixed effects IV estimator addresses all types of endogeneity issues, including unobserved heterogeneity and potential reverse causality.

As shown in Table 1.B, the coefficient of the IV estimation indicates that social interaction is significantly and positively correlated with the probability of being employed full time. Specifically, increasing active group memberships by one increases the probability of being employed by 34.7%. Here, the two-stage least square econometric method is applied. In the first stage, the instrumental variable ($\widetilde{SI_{i,t}}$) is statistically significantly and correlated with the social interaction at time t ($SI_{i,t}$), which can statistically demonstrate that the instrumental variable is valid since the instrumental variable is correlated with the endogenous variable[5]. The result of the

[5] The results of the first stage of this 2SLS regression can be seen in the first column of Appendix 3.

second stage acquired by employing the predicted social interaction index ($\widehat{SI_{i,t}}$) from the first stage, which shows evidence of a positive statistically significant social interaction effect.

The last two columns of Table 2 show the social interaction effects on labour market outcomes when considering heterogeneous gender effects while employing the fixed effects IV model. The estimates of social interaction are all positive and, generally, statistically significant. One additional active group membership leads to a 40.9% increased probability of having full-time employment for females and a 31.1% increase for males. This result is similar to the findings from pooled OLS models.

Regarding the lifecycle effect of social interaction, the coefficients estimated by the fixed effects IV approach are displayed in Table 3 (3). The social interaction effect is statistically significant for individuals for all age groups. Specifically, in the earlier age group, 18-24, the influence of social interaction is the most pronounced. With every additional active group membership, the probability of being employed increases by 138.9%. This social interaction effect becomes least important when the individual reaches the 35-39 age group. In that group, the probability of having full-time employment increases by 11.7% for each additional active group membership.

5 Social interaction indices

The previous sections identified the overall social interaction effects on job market outcomes. However, the social interaction index used thus far is measured as the sum of active group memberships regardless of the types of groups. Nevertheless, one may argue that individuals in different groups may reap different benefits depending on their type (e.g., sports clubs and trade unions).

As shown in Appendix 1, the employment sample has a higher mean value in each single active group membership than the unemployment sample except for voluntary groups. Nevertheless, after controlling for the individual characteristics that would affect an individual's labour market outcome (e.g., education, age and marital status), not all the active group memberships significantly affect individuals' labour market outcomes according to the fixed effects IV estimation (shown in Appendix 4 and the first stage results shown in Appendix 5). Among all the active group memberships, membership in trade unions has the most significant positive effect on an individual's

employment status. With one additional active membership in a trade union, the probability of having employment increases 139.6%. The likelihood of being employed is reduced 114.6% for each increase in active membership in a voluntary group. However, an individual may be less likely to join only one group/organisation in his or her lifetime. It would be instinctive to explore the effects of social interactions on job market outcomes within different sets of groups.

5.1 Principal component analysis (PCA)

To capture active membership in different sets of groups, I employ the PCA method. Through this method, I build different social interaction (SI) indices. PCA is a multivariate statistical technique that aims to build indices to measure different dimensions of the original data. It accomplishes this by reducing the number of variables in a dataset into a smaller number of dimensions. Currently, the PCA is broadly used to build indices for certain economic and social characteristics, such as socio-economic status and education level (Gwatkin *et al*. 2000; Filmer and Pritchett 2001; McKenzie 2003). Mathematically, the PCA constructs uncorrelated indices or components from an initial set of n correlated variables. Each component is a linear weighted combination of the initial variables. For instance, for a set of variables from x_1 *to* x_n,

$$\begin{aligned} PC_1 &= a_{11}X_1 + a_{12}X_2 + \cdots + a_{1n}X_n \\ &\vdots \\ PC_m &= a_{m1}X_1 + a_{m2}X_2 + \cdots + a_{mn}X_n \end{aligned} \tag{7}$$

where a_{mn} represents the weight of the mth principal component and the nth variable. $a_{11}^2 + a_{12}^2 + \cdots + a_{1n}^2 = 1$.

The weights for each principal component are decided by the eigenvectors of the correlation matrix. If the original data were standardised, the weights are given by the covariance matrix. The variance (λ) for each principal component is equal to the eigenvalue of the corresponding eigenvector. The components are ordered and orthogonal. The first component (PC_1) captures the largest possible amount of variation for the original data. The second component (PC_2) explains the additional

variation that is not captured by PC_1. However, PC_2 has less explaining power than PC_1 for the original data, and PC_2 is completely uncorrelated with PC_1. Subsequent components have the same property. Thus, each component captures smaller and smaller proportions of the variation of the original variables and describes an additional dimension for the original data.

Before the application of the PCA, the variables used to build the SI indices need to be prepared. Here, each active group membership is considered. The groups are political parties, trade unions, environment groups, parents' associations, tenants' or residents' groups, religious groups, voluntary service groups, professional organisations, other community groups, other social groups and sport clubs. I exclude some groups, such as pensioner organisations, Scout/Guides organisations, women's institutes and any other groups as the elements of the variables put into the PCA programme. These groups are excluded because membership in them is restricted to specific parts of the population such as children, the elderly or females.

5.2 Application of the PCA

Since the values of variables in my case are ordinal numbers, the correspondence analysis PCA[6] (Lebart 2013) is applied. The number of principal components to be extracted determined based on the number of components with a corresponding eigenvalue above one. Three components are chosen for extraction here. The PC_1 index captures active membership in political, environmental, tenants' or residents', voluntary service, and other community groups. The PC_2 index measures active membership in trade unions, as well as political, religious and other social groups. The PC_3 index includes membership in professional organisations and sport clubs. The table of correspondence analysis PCA eigenvector, factor loadings and factor scoring coefficients can be found in Appendix 6. Moreover, these three indices built by the correspondence analysis PCA approach are justified by the Kaiser-Meyer-Olkin (KMO) test.[7]

[6] This is a kind of PCA technique that is used to deal with dummies and ordinal numbers.
[7] The KMO test can determine whether the constructed indices are valid. The acceptable level for the KMO test is 0.5, which implies the component or factor analysis is useful for the original data. In my case, the result of the KMO test is 0.76.

The estimation results of the three SI indices are shown in Table 4. I start with the most general regression method of a pooled OLS, initially ignoring the possible endogeneity issues. The coefficients of the second and third indices illustrate the significant positive effect on the probability of being employed full time. One standard deviation increase in the PC_2 index results in a 0.9% higher probability of being employed. With regard to the PC_3 index, one standard deviation increase leads to the possibility of being employed increasing by 1.3%. The coefficient of the first index is negative yet not significant from the pooled OLS model.

In addition, to eliminate the unobserved heterogeneity, fixed effects estimations are applied. By using the fixed effects approach, the results show that only the second SI index (PC_2) plays a positive and significant role in one's employment status. A one standard deviation increase of the PC_2 index increases in the probability of being employed by 0.45%. To address all endogeneity problems in terms of unobserved heterogeneity and potential reverse causality, the fixed effects IV estimation is used. The all three SI indices are positively and significantly related to the labour market outcome. Particularly with regard to the value of coefficient, the second index (PC_2) once again plays the most effective role in an individual's employment status. When I consider the standard deviation change, both the second and third SI indices contribute a vital effect. Specifically, a one standard deviation increase of the PC_2 index and the PC_3 index results in a 32% and 33% higher probability of having full-time employment, respectively. The coefficient of the first index, PC_1, reveals that the probability of being employed full time increases by 5.8% with a one standard deviation increase in the PC_1.

The aforementioned results indicate that the third SI index, which includes active memberships in professional organisations and sports clubs, is the most effective in regard to the job market outcomes. As shown in Appendix 6, active membership in professional and sport groups is positively associated with the scores of the third components. Specifically, a one standard deviation increase in active memberships in professional organisations and sport clubs leads to the standardised scores of the PC_3 index increasing by 0.474 and 0.77 points, respectively. The network sizes of sport clubs are also the largest; approximately 23% of participants from the full sample are involved in a sport group. Thus, these results offer support to the model of Calvo-

Armengol and Zenou (2005), who suggest that network size would make a difference in job market success.

Table 4. Correlation between pc1/pc2/pc3 indices and employment status

	(1) pooled OLS	(2) pooled OLS	(3) pooled OLS	(4) fe	(5) fe	(6) fe	(7) feiv	(8) feiv	(9) feiv
Pc1	-0.002			-0.004			0.286***		
	(0.006)			(0.006)			(0.052)		
Pc2		0.036***			0.017***			1.202***	
		(0.004)			(0.005)			(0.059)	
Pc3			0.036***			0.002			0.920***
			(0.003)			(0.003)			(0.045)
Age	0.013***	0.012***	0.012***	0.016***	0.016***	0.016***	0.015***	0.021***	0.017***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Age2	-0.0001***	-0.0001***	-0.0001***	-0.0001***	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0001***
	(9.09e-06)	(9.09e-06)	(9.08e-06)	(0.0001)	(0.00001)	(0.00001)	(0.00001)	(0.00002)	(0.00002)
Higher degree	0.108***	0.111***	0.100***	0.047*	0.045*	0.046*	0.036	-0.041	-0.044
	(0.007)	(0.006)	(0.006)	(0.024)	(0.024)	(0.024)	(0.025)	(0.041)	(0.042)
1st degree	0.104***	0.108***	0.098***	0.022	0.021	0.022	0.018	-0.050	-0.015
	(0.004)	(0.004)	(0.004)	(0.019)	(0.019)	(0.019)	(0.020)	(0.033)	(0.034)
Hnd, hnc, teaching	0.097***	0.099***	0.092***	0.037*	0.037*	0.037*	0.031	0.026	0.057
	(0.005)	(0.005)	(0.005)	(0.021)	(0.021)	(0.021)	(0.021)	(0.035)	(0.036)
A level	0.098***	0.099***	0.094***	0.042**	0.041**	0.042**	0.045**	-0.009	0.071**
	(0.004)	(0.004)	(0.004)	(0.017)	(0.017)	(0.017)	(0.018)	(0.029)	(0.030)
O level	0.082***	0.083***	0.080***	0.038**	0.037**	0.038**	0.037**	-0.014	0.027
	(0.003)	(0.003)	(0.003)	(0.017)	(0.017)	(0.017)	(0.018)	(0.029)	(0.030)
Cse	0.064***	0.064***	0.063***	-0.018	-0.019	-0.018	-0.020	-0.116**	0.003
	(0.005)	(0.005)	(0.005)	(0.029)	(0.029)	(0.029)	(0.030)	(0.049)	(0.050)
Married	0.060***	0.060***	0.060***	0.014***	0.015***	0.014***	0.016***	0.026***	0.040***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)	(0.007)
Ethnic	0.052***	0.050***	0.050***						
	(0.006)	(0.006)	(0.006)						
Anychild	-0.029***	-0.027***	-0.029***	-0.014***	-0.013***	-0.014***	-0.020***	0.026***	-0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.006)	(0.006)
Female	0.010***	0.013***	0.013***						
	(0.002)	(0.002)	(0.002)						
Region	-0.001*	-0.001*	-0.001	-0.014***	-0.014***	-0.014***	-0.015***	-0.017**	-0.020**
	(0.001)	(0.001)	(0.001)	(0.005)	(0.005)	(0.005)	(0.005)	(0.008)	(0.009)
Health	-0.083***	-0.083***	-0.081***	-0.027***	-0.027***	-0.027***	-0.028***	-0.018*	-0.025***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)	(0.009)	(0.010)
Constant	0.524***	0.524***	0.521***	0.597***	0.595***	0.597***	0.597***	0.413***	0.306***
	(0.015)	(0.015)	(0.015)	(0.029)	(0.029)	(0.029)	(0.030)	(0.049)	(0.052)
Sample Size	49227	49227	49227	49227	49227	49227	50375	50375	50375
Population size				11,997	11,997	11,997	12,520	12,520	12,520
R-square	0.0491	0.0506	0.0517	0.025	0.025	0.025	0.015	0.004	0.022

* p<0.10, ** p<0.05, *** p<0.01

Notes: The time periods of the sample are 1993-1995, 1997, 1999, 2001, 2003, 2005, and 2007. The dependent variab is employment status, which takes a value of one if the individual is engaged in paid full-time employment and ze otherwise. Age represents the respondent's age. Higher degree, 1st degree, Hnc, A level, O level, and Cse are dummy variables that represent the six levels education levels. Married is a dummy variable that indicates one marriage status. Ethnic is a dummy variable that takes a value of one if the individual is white and zero otherwis Anychild and Female are dummy variables that indicate whether the respondent has a child or not and whether t respondent is female or not. Region represents the respondent's region of residence, which takes the value 1 (Londo 2 (S England), 3 (N England), 4 (Wales), 5 (Scotland), or 6 (N Ireland). Health is a dummy variable and represents t

health status of the respondent. It takes a value of one if the individual is currently experiencing anxiety a depression when answering the survey and zero otherwise.

6 Match quality

The previous analysis demonstrated that social interactions could affect employment status. In this section, I investigate the influence of social interactions on employment characteristics such as wages.

Compared with individuals who have fewer social interactions, those with more social interactions should receive more information. Presumably, this leads to relatively higher wages since a person with more social interactions has a larger set of choices. Generally, the reservation wage would increase with the probability of receiving job offers (Devine and Kiefer 1991), thus indicating that the larger set of choices may increase the prospect of a higher salary. Of course, a counterargument is that some workers may treat informal networks as a last resort, an outcome that could be associated with low wages (Loury 2006). Indeed, Bentolila *et al*. (2010) reveal that the information circulated within the social network may not exactly match the ability of the job-seeker, thus leading to an ambiguous effect on wages.

Indeed, previous research has shown mixed empirical results. On the one hand, the positive correlation between social interactions and wages is captured by Simon and Warmer (1992), Marmaros and Sacerdore (2002), Loury (2006). On the other hand, a negative correlation has been shown by Pistaferri (1999), Bentolila *et al*. (2010), Goel and Lang (2012). Finally, some researchers find no significant interaction between the two (Bridges and Villemez 1986; Holzer 1987; Marsden and Hulbert 1988).

The longitudinal aspect of the BHPS allows me to investigate the association between social interactions and wages for each full-time respondent over time. The econometric model for the wage equation is given by the following:

$$\log\left(W_{i,t}\middle|Y_{i,t}=1\right)= \alpha+\beta X_{i,t}+\gamma SI_{i,t}+a_i+\varepsilon_{i,t} \qquad (8)$$

where $W_{i,t}$ denotes the current job's monthly earnings for individual *i* at period t. The error term is $\varepsilon_{i,t}$ and a_i is the unobserved individual fixed effect, which captures the unobserved heterogeneity effect of each individual on wages. The specifications of $\mathrm{SI_{i,t}}$ and $\mathrm{X_{i,t}}$ are the same as those used in equation (1). $Y_{i,t}=1$ implies that the

estimation of the effect of social interactions on wages is based only on full-time employed observations.

The first column in Table 5 shows that social interaction has a significant and positive effect on wages based on the pooled OLS regression. One additional active group membership is associated with a 1.6% higher monthly wage. While this result reveals a positive social interaction effect on wages, it should be taken with caution since some unobserved heterogeneity, which leads to a higher wage, may also motivate an individual to become a member of a particular group/organisation. Therefore, the fixed effects model is applied here to eliminate the problem of unobserved heterogeneity. The second column of Table 5 demonstrates the fixed effects estimation results. The fixed effects estimator shows that social interaction has a positive yet insignificant effect on an individual's monthly wages. Notably, active group membership might also be influenced by wages. Therefore, the fixed effects IV is employed to address potential reverse causality. The coefficient from the fixed effects IV approach reveals that social interaction is indeed positively and significantly associated with monthly wages. Every additional active group membership leads to an 11.2% increase in monthly wages.

I also explore the social interaction effect on the monthly wages for different gender groups. The estimation results are displayed in Table 6. I begin with the pooled OLS model to investigate the social interaction effect for the female and male groups while momentarily ignoring the unobserved individual characteristics. I find that social interaction has an equivalent positive and significant effect on female and male groups. One additional active group membership results in a 1.6% higher monthly wage for both gender groups. When I control for unobserved heterogeneity, I find that the social interaction effect is more important among males. This result is in line with the empirical work done by Loury (2004), who works with the National Longitudinal Survey of Youth, and suggests that social networks have significant wage effects for men. The monthly wage increases by 0.6% as the individual has an additional active group membership. The coefficients from the fixed effects IV estimation also demonstrate that the social interaction effect is positive and statistically significant for males and females, but this time, the social interaction influence is more pronounced in females. With every additional active group membership for women, their monthly

wages increase by 1.7%. Therefore, after controlling for all the endogeneity problems, social interaction is found to play an important role in the individual's monthly wages, and this effect is more profound among females.

Furthermore, I investigate the influence of social interactions on wages for different types of occupations. Workers in different types of occupations may prefer particular groups. For instance, an individual who is employed as a manager may tend to join certain professional groups. Presumably, social interaction may play a different role in monthly wages for workers with different occupation types. In this sample, the occupation types are grouped into six subsamples: unskilled, partly skilled, skilled manual, skilled non-manual, managerial/technical and professional. As shown in the first column of Table 7, the coefficients of social interaction display the heterogeneous effects of social interaction on monthly wages for different occupations when using a pooled OLS model. Notably, social interaction has a negative and significant effect on monthly wages for the unskilled group. As an unskilled worker has one more active group membership, his or her monthly wages decrease by 1.9%. For the other occupation groups, social interaction effects are all positive when related to monthly wages, though they are not all statistically significant. In particular, social interaction shows the most important positive effect for the managerial/technical group, which has the highest and most significant coefficient in the SI index. With an additional active group membership, monthly wages increase 2.7% among the managerial/technical group. Regarding the problem of unobserved heterogeneity, the fixed effects estimation is employed. Once I control for the fixed effects, the coefficients of the SI index for all occupation subsamples are statistically insignificant except for the managerial/technical group. One additional active group membership results in a 1.5% higher monthly wage. To address the potential reverse causality, the fixed effects IV estimation is applied. However, the coefficients of social interaction are all statistically insignificant for all occupation types. Thus, worker types do not matter for the effect of social interaction on an individual's monthly wages.

Table 5. Correlation between social interaction and wages

	(1) pooled OLS	(2) fe	(3) feiv
Social interaction	0.016***	0.002	0.112***
	(0.002)	(0.002)	(0.017)
Age	0.071***	0.130***	0.130***
	(0.002)	(0.002)	(0.002)
Age2	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Higher degree	0.848***	0.212***	0.182***
	(0.013)	(0.036)	(0.038)
1st degree	0.724***	0.139***	0.120***
	(0.008)	(0.029)	(0.031)
Hnd, hnc, teaching	0.533***	0.062**	0.053
	(0.010)	(0.031)	(0.033)
A level	0.386***	0.017	0.012
	(0.008)	(0.027)	(0.029)
O level	0.280***	0.024	0.011
	(0.007)	(0.027)	(0.028)
Cse	0.202***	0.070	0.061
	(0.011)	(0.044)	(0.046)
Married	0.072***	0.030***	0.036***
	(0.006)	(0.006)	(0.006)
Ethnic	0.067***		
	(0.014)		
Anychild	-0.002	-0.033***	-0.038***
	(0.005)	(0.005)	(0.005)
Female	-0.281***		
	(0.005)		
Region	-0.004**	-0.022***	-0.025***
	(0.002)	(0.008)	(0.008)
Health	-0.096***	-0.019**	-0.019**
	(0.011)	(0.008)	(0.009)
Constant	5.361***	3.850***	3.770***
	(0.031)	(0.045)	(0.048)
Sample Size	39994	40963	40963
Population size		10885	10885
R-square	0.34	0.038	0.043

* p<0.10, ** p<0.05, *** p<0.01

Notes: The time periods of the sample are 1993-1995, 1997, 1999, 2001, 2003, 2005, and 2007. The dependent variable is the respondent's monthly wage. Social interaction is proxied by active group membership. Age represents the respondent's age. Higher degree, 1st degree, Hnc, A level, O level, and Cse are all dummy variables that represent the six levels of education. Married and Ethnic are dummy variables that indicates one's marriage status and whether one is white or not. Anychild and Female are dummy variables that represent whether the respondent has a child or not and whether the respondent is female or not. Region represents one's region of residence, which takes a value of 1 (London), 2 (S England), 3 (N England), 4 (Wales), 5 (Scotland), or 6 (N Ireland). Health is a dummy variable. It takes a value of one if the individual is currently experiencing anxiety and depression when answering the survey and zero otherwise.

Table 6. Correlation between social interaction and wages for different gender groups

	(1) pooled OLS female	(2) pooled OLS male	(3) fe female	(4) fe male	(5) feiv female	(6) feiv male
Social interaction	0.016***	0.016***	-0.003	0.006**	0.170***	0.080***
	(0.004)	(0.003)	(0.003)	(0.003)	(0.031)	(0.021)
Age	0.072***	0.075***	0.124***	0.133***	0.124***	0.133***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
Age2	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Higher degree	0.990***	0.743***	0.075	0.274***	0.020	0.256***
	(0.021)	(0.016)	(0.053)	(0.048)	(0.060)	(0.049)
1st degree	0.856***	0.621***	0.070	0.164***	0.031	0.156***
	(0.013)	(0.011)	(0.043)	(0.040)	(0.049)	(0.041)
Hnd, hnc, teaching	0.612***	0.474***	-0.030	0.125***	-0.054	0.122***
	(0.015)	(0.012)	(0.046)	(0.043)	(0.052)	(0.044)
A level	0.470***	0.324***	-0.052	0.059	-0.058	0.056
	(0.013)	(0.010)	(0.040)	(0.037)	(0.045)	(0.037)
O level	0.336***	0.249***	-0.061	0.093**	-0.086**	0.085**
	(0.011)	(0.009)	(0.038)	(0.037)	(0.043)	(0.038)
Cse	0.226***	0.189***	-0.016	0.120**	-0.006	0.106*
	(0.018)	(0.014)	(0.068)	(0.058)	(0.076)	(0.060)
Married	-0.003	0.125***	0.017**	0.033***	0.020**	0.039***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
Ethnic	0.024	0.086***				
	(0.021)	(0.018)				
Anychild	-0.082***	0.035***	-0.101***	0.005	-0.114***	0.002
	(0.009)	(0.007)	(0.008)	(0.007)	(0.009)	(0.007)
Region	-0.000	-0.006***	-0.027**	-0.019*	-0.031**	-0.021**
	(0.002)	(0.002)	(0.011)	(0.010)	(0.013)	(0.010)
Health	-0.071***	-0.126***	-0.021**	-0.017	-0.018	-0.018
	(0.014)	(0.018)	(0.011)	(0.014)	(0.012)	(0.014)
Constant	5.130***	5.251***	3.871***	3.862***	3.762***	3.803***
	(0.049)	(0.040)	(0.068)	(0.058)	(0.080)	(0.062)
Sample Size	16741	23253	17159	23804	17159	23804
Population size			5021	5864	5021	5861
R-square	0.3188	0.3063	0.003	0.099	0.006	0.103

* p<0.10, ** p<0.05, *** p<0.01

Notes: The time periods of the sample are 1993-1995, 1997, 1999, 2001, 2003, 2005, and 2007. The dependent variable is the respondent's monthly wage. Social interaction is proxied by active group membership. Age represents the respondent's age. Higher degree, 1st degree, Hnc, A level, O level, and Cse are all dummy variables that represent the six levels of education. Married is a dummy variable that indicates one's marriage status. Ethnic is a dummy variable that takes a value of one if the individual is white and zero otherwise. Anychild and Female are dummy variables that represent whether the respondent has a child or not and whether the respondent is female or not. Region represents the respondent's region of residence, which takes a value of 1 (London), 2 (S England), 3 (N England), 4 (Wales), 5 (Scotland), or 6 (N Ireland). Health is a dummy variable and represents the health status of the respondent. It takes a value one if the individual is currently experiencing anxiety and depression when answering the survey and zero otherwise.

Table 7. Correlation between social interaction and wages for different occupation group

	(1) Pooled OLS	(2) Fixed effects	(3) Fixed effect IV
Unskilled	-0.019**	0.011	0.038
	(0.008)	(0.007)	(0.031)
Partly skilled	0.009**	0.004	0.031
	(0.004)	(0.003)	(0.022)
Skilled manual	0.005	-0.002	-0.014
	(0.005)	(0.005)	(0.034)
Skilled non-manual	-0.005	0.007	0.005
	(0.006)	(0.005)	(0.034)
Managerial/ technical	0.027***	0.015*	-0.053
	(0.007)	(0.008)	(0.059)
Professional	0.009	0.010	0.002
	(0.020)	(0.022)	(0.063)

* p<0.10, ** p<0.05, *** p<0.01

7 Conclusion

In recent decades, the importance of the effect of social interaction on the labour market has attracted significant attention. Earlier studies suggest various mechanisms through which social interaction might affect an individual's labour market outcome. The transmission of information through social interactions has been viewed as a useful complementary approach to accessing to labour market. Individuals with better social interaction are presumably able to acquire more job information, which facilitates a job search and may eventually lead to a higher probability of being employed. Additionally, the rich job information provided by social interaction allows individuals to select among a set of different jobs, which may help an individual obtain a job with relatively higher wages. Nevertheless, the influence of social interaction on wages might be ambiguous since a mismatch can occur between the skills of individuals and the job information provided.

In this chapter, I contribute a new measure of social interaction based on an individual's number of active group membership by employing longitudinal data from the BHPS. Using various identification strategies, I provide robust evidence that social interaction is related to a higher probability of being employed full time. This social interaction effect is more important to the employment status of females and individuals in all age groups. The social interaction effect of different sets of groups on labour market outcomes is also investigated. Active group memberships in professional organisations and sport clubs have the largest effect. Regarding wages,

social interaction shows a positive and statistically significant effect. The influence of social interaction on monthly wages is once again more pronounced among females. However, social interaction shows no significant effect on wages when I consider differences in occupation types.

Overall, this chapter is an initial study that considers the intensity of participation in groups (for each individual) and empirically investigates the correlation between social interaction (within weak ties) and labour market outcomes. To keep a sharp focus on the effect of social interaction (within groups) and labour market outcomes, I overlooked other mechanisms through which active group membership might affect labour market performance. For example, membership in certain special groups could function as a signal to represent certain personality traits, which could help individuals obtain a job. All these issues offer a scope for further research on the SI index and the correlation between social capital and labour market outcomes.

Appendix

Appendix 1. Sample statistics

	Full Sample	
	Mean	Std.Dev.
Employment		
Employed currently	0.934	0.248
Demographics		
Age	38.835	11.533
Dummy for female	0.385	0.487
Dummy for white	0.969	0.173
Education		
Higher degree	0.035	0.184
First degree	0.139	0.346
Other higher education	0.083	0.276
A-level	0.221	0.415
O-level	0.278	0.448
Cse	0.06	0.237
None of these qualification	0.185	0.388
Family structure		
Dummy for married	0.717	0.451
Dummy for anychild	0.349	0.477
Dummy for having health problems	0.045	0.208
Metropolitan area	percent	
London	7.36	
South England	40.67	
North England	16.14	
Wales	11.9	
Scotland	15.62	
North Ireland	8.31	

Appendix 1. Continued

	Sample mean	Std.Dev.	Employed group	Unemployed group
Active membership				
Political party	0.01	0.1	0.01	0.008
Trade union	0.054	0.226	0.057	0.007
Environmental group	0.017	0.128	0.017	0.013
Parents association	0.048	0.215	0.05	0.032
Tenants group	0.026	0.16	0.027	0.022
Religious group	0.083	0.276	0.084	0.064
Voluntary group	0.027	0.163	0.026	0.042
Pensioners organisation	0.001	0.034	0.001	0.001
Scout/guides organization	0.015	0.122	0.016	0.008
Professional orgnization	0.041	0.199	0.044	0.01
Other community group	0.015	0.123	0.016	0.012
Social group	0.091	0.288	0.092	0.075
Sport club	0.229	0.42	0.235	0.141
Women institute	0.004	0.063	0.004	0.003
Women group	0.004	0.067	0.005	0.003
Other organisation	0.047	0.211	0.048	0.032
social interaction index	0.691	0.913	0.708	0.464
pc1 index	0.078	0.204	0.079	0.056
pc2 index	0.056	0.268	0.058	0.03
pc3 index	0.231	0.36	0.237	0.136
Person-year observation			54,405	
Number of persons			13,071	

Appendix 2.

A. Correlation between social interaction and employment status at different age stage by pooled OLS regression model

	(1) age 18-24	(2) age 25-29	(3) age 30-34	(4) age 35-39	(5) age 40-44	(6) age 45-49	(7) age 50-54	(8) age 55-65
Social interaction	0.030***	0.010**	0.009***	0.009***	0.012***	0.008***	0.013***	0.003
	(0.006)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)
Higher degree	0.200***	0.223***	0.155***	0.107***	0.100***	0.060***	0.077***	0.067***
	(0.047)	(0.021)	(0.017)	(0.015)	(0.014)	(0.014)	(0.018)	(0.022)
1st degree	0.211***	0.216***	0.170***	0.112***	0.076***	0.054***	0.062***	0.049***
	(0.020)	(0.014)	(0.012)	(0.010)	(0.009)	(0.009)	(0.012)	(0.014)
Hnd, hnc, teaching	0.235***	0.210***	0.166***	0.108***	0.071***	0.056***	0.038***	0.053***
	(0.024)	(0.016)	(0.013)	(0.011)	(0.011)	(0.011)	(0.013)	(0.014)
A level	0.223***	0.207***	0.159***	0.112***	0.080***	0.046***	0.035***	0.060***
	(0.017)	(0.014)	(0.011)	(0.009)	(0.009)	(0.008)	(0.010)	(0.011)
A level	0.199***	0.194***	0.145***	0.095***	0.072***	0.049***	0.026***	0.052***
	(0.017)	(0.014)	(0.011)	(0.009)	(0.008)	(0.008)	(0.009)	(0.009)
Cse	0.159***	0.153***	0.119***	0.079***	0.083***	0.058***	0.066**	0.054
	(0.019)	(0.017)	(0.013)	(0.012)	(0.012)	(0.016)	(0.030)	(0.042)
Married	0.075***	0.061***	0.068***	0.033***	0.060***	0.055***	0.074***	0.072***
	(0.010)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.009)	(0.010)
Ethnic	0.174***	0.058***	0.023	0.016	0.076***	0.016	0.040*	0.015
	(0.026)	(0.017)	(0.014)	(0.014)	(0.015)	(0.016)	(0.024)	(0.024)
Anychild	-0.125***	-0.058***	-0.031***	-0.002	-0.006	-0.008	-0.022**	-0.010
	(0.017)	(0.008)	(0.006)	(0.006)	(0.006)	(0.006)	(0.010)	(0.017)
Female	0.024***	0.004	-0.004	0.014***	0.011**	0.006	0.002	0.015*
	(0.009)	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)	(0.007)	(0.008)
Region	-0.001	0.002	0.003	-0.005***	-0.003*	-0.0001	0.002	-0.005**
	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Health	-0.080***	-0.113***	-0.081***	-0.087***	-0.038***	-0.078***	-0.080***	-0.100***
	(0.024)	(0.017)	(0.013)	(0.012)	(0.012)	(0.012)	(0.015)	(0.017)
Constant	0.479***	0.652***	0.737***	0.829***	0.768***	0.852***	0.801***	0.836***
	(0.030)	(0.021)	(0.018)	(0.017)	(0.018)	(0.018)	(0.025)	(0.026)
Sample Size	6014	6241	6735	6948	6608	6277	5207	5197
R-square	0.070	0.078	0.067	0.045	0.042	0.031	0.034	0.031

* p<0.10, ** p<0.05, *** p<0.01

Notes: The time period of the sample includes 1993-1995, 1997, 1999, 2001, 2003, 2005, and 2007. The dependent variable is employment status, which takes the value one if the individual is in paid full-time employment and zero otherwise. Social interaction is proxied by active group membership. Age represents the respondent's age. Higher degree, 1st degree, Hnc, A level, O level, Cse are all dummy variables which represents the six education levels. Married is a dummy variable which indicates one's marriage status. Ethnic is a dummy variable which takes the value one if the individual is white and zero otherwise. Anychild and Female are dummy variables, which stand for whether the respondent has any child or not and whether the respondent is female or not. Region represents the respondent's residence region, which takes values 1 (London), 2 (S England), 3 (N England), 4 (Wales), 5 (Scotland), 6 (N Ireland). Health is a dummy variable and represents the health status of the respondent. It takes the value one if the individual is currently experiencing anxiety and depression when answering the survey and zero otherwise.

B. Correlation between social interaction and employment status at different age stage in the fixed effects regression model

	(1) age 18-24	(2) age 25-29	(3) age 30-34	(4) age 35-39	(5) age 40-44	(6) age 45-49	(7) age 50-54	(8) age 55-65
Social interaction	-0.002	-0.007	0.002	-0.002	0.005	-0.002	0.007	-0.007*
	(0.009)	(0.006)	(0.004)	(0.003)	(0.004)	(0.003)	(0.005)	(0.004)
Higher degree	0.112	-0.031	-0.056	0.006	0.311***	-0.006	-0.038	0.008
	(0.204)	(0.170)	(0.105)	(0.086)	(0.102)	(0.083)	(0.141)	(0.121)
1st degree	0.101	-0.246	-0.079	-0.001	0.298***	0.008	-0.034	-0.048
	(0.126)	(0.160)	(0.098)	(0.072)	(0.082)	(0.078)	(0.087)	(0.154)
Hnd, hnc, teaching	0.149	-0.248	0.037	-0.003	0.302***	-0.005	-0.029	-0.065
	(0.118)	(0.160)	(0.090)	(0.079)	(0.088)	(0.078)	(0.091)	(0.125)
A level	0.127	-0.318**	-0.010	-0.002	0.370***	0.023	-0.037	-0.081
	(0.114)	(0.145)	(0.082)	(0.068)	(0.067)	(0.060)	(0.071)	(0.055)
O level	0.085	-0.282*	-0.009	-0.001	0.292***	-0.021	-0.077	0.021
	(0.117)	(0.155)	(0.080)	(0.066)	(0.065)	(0.052)	(0.072)	(0.064)
Cse	-0.021	-0.146	-0.004	-3.52e-06	0.298**	-0.029		
	(0.141)	(0.185)	(0.110)	(0.099)	(0.150)	(0.199)		
Married	0.056***	-0.008	-0.023*	-0.033***	-0.011	0.026	0.014	-0.010
	(0.015)	(0.012)	(0.013)	(0.013)	(0.017)	(0.017)	(0.024)	(0.023)
Anychild	-0.031	0.030**	-0.011	-0.007	-0.008	-0.017*	-0.029*	0.020
	(0.027)	(0.015)	(0.012)	(0.012)	(0.011)	(0.010)	(0.016)	(0.021)
Region	-0.077***	0.003	-0.0004	0.011	0.012	-0.019	0.001	-0.193***
	(0.026)	(0.015)	(0.018)	(0.017)	(0.023)	(0.023)	(0.038)	(0.025)
Health	-0.049	-0.046**	0.012	-0.041***	0.016	-0.036***	-0.015	-0.013
	(0.031)	(0.022)	(0.016)	(0.014)	(0.016)	(0.014)	(0.018)	(0.017)
Constant	1.004***	1.170***	0.985***	0.949***	0.660***	0.999***	0.954***	1.563***
	(0.129)	(0.146)	(0.092)	(0.080)	(0.090)	(0.082)	(0.127)	(0.090)
Sample Size	6347	6519	6921	7073	6696	6329	5249	5241
Population size	3033	3547	3709	3767	3563	3271	2740	2174
R-square	0.011	0.042	0.010	0.002	0.027	0.002	0.0001	0.0001

* p<0.10, ** p<0.05, *** p<0.01

Notes: The time period of the sample includes 1993-1995, 1997, 1999, 2001, 2003, 2005, and 2007. The dependent variable is employment status, which takes the value one if the individual is in paid full-time employment and zero otherwise. Social interaction is proxied by active group membership. Age represents the respondent's age. Higher degree, 1st degree, Hnc, A level, O level, Cse are all dummy variables which represents the six education levels. Married is a dummy variable which indicates one's marriage status. Ethnic is a dummy variable which takes the value one if the individual is white and zero otherwise. Anychild and Female are dummy variables, which stand for whether the respondent has any child or not and whether the respondent is female or not. Region represents the respondent's residence region, which takes values 1 (London), 2 (S England), 3 (N England), 4 (Wales), 5 (Scotland), 6 (N Ireland). Health is a dummy variable and represents the health status of the respondent. It takes the value one if the individual is currently experiencing anxiety and depression when answering the survey and zero otherwise.

C. Correlation between social interaction and employment status at different age stage in the Fixed effects iv regression model

	(1) age 18-24	(2) age 25-29	(3) age 30-34	(4) age 35-39	(5) age 40-44	(6) age 45-49	(7) age 50-54	(8) age 55-65
Social interaction	1.389***	0.790***	0.240***	0.117***	0.202***	0.234***	0.248***	0.326***
	(0.309)	(0.249)	(0.054)	(0.026)	(0.037)	(0.045)	(0.040)	(0.084)
Higher degree	-0.411	-0.096	-0.018	0.036	0.379***	0.072	-0.114	-0.103
	(0.607)	(0.483)	(0.149)	(0.103)	(0.139)	(0.137)	(0.206)	(0.228)
1st degree	0.145	-0.404	-0.044	0.021	0.274**	0.079	0.021	0.359
	(0.368)	(0.458)	(0.138)	(0.085)	(0.111)	(0.129)	(0.126)	(0.306)
Hnd, hnc, teaching	0.225	-0.081	0.021	0.034	0.285**	0.005	-0.007	0.100
	(0.345)	(0.458)	(0.127)	(0.094)	(0.119)	(0.128)	(0.132)	(0.237)
A level	0.143	-0.338	0.031	0.039	0.380***	0.196*	0.024	-0.042
	(0.334)	(0.411)	(0.116)	(0.081)	(0.091)	(0.104)	(0.103)	(0.104)
O level	0.184	-0.278	0.032	0.015	0.328***	0.048	-0.123	-0.039
	(0.342)	(0.442)	(0.114)	(0.079)	(0.089)	(0.086)	(0.105)	(0.121)
Cse	0.360	-0.551	0.095	-0.009	0.274	0.026		
	(0.421)	(0.542)	(0.157)	(0.118)	(0.203)	(0.326)		
Married	0.055	0.050	-0.028	-0.022	0.007	0.051*	-0.032	0.020
	(0.045)	(0.039)	(0.018)	(0.015)	(0.024)	(0.028)	(0.036)	(0.044)
Anychild	-0.006	-0.003	0.014	-0.004	-0.017	-0.029*	-0.072***	0.004
	(0.079)	(0.044)	(0.017)	(0.014)	(0.015)	(0.016)	(0.024)	(0.040)
Region	-0.204**	-0.036	-0.005	0.018	-0.010	0.025	-0.035	-0.177***
	(0.080)	(0.044)	(0.025)	(0.021)	(0.031)	(0.039)	(0.056)	(0.047)
Health	-0.139	0.015	0.036	-0.043***	0.024	-0.052**	-0.011	0.027
	(0.093)	(0.065)	(0.023)	(0.017)	(0.022)	(0.023)	(0.026)	(0.033)
Constant	0.611	0.847**	0.802***	0.812***	0.561***	0.592***	0.917***	1.201***
	(0.388)	(0.427)	(0.137)	(0.100)	(0.123)	(0.155)	(0.185)	(0.191)
Sample size	6347	6519	6921	7073	6696	6329	5249	5241
Population size	3033	3547	3709	3767	3563	3271	2740	2174
R-square	0.013	0.003	0.002	0.007	0.025	0.010	0.003	0.003

* p<0.10, ** p<0.05, *** p<0.01

Notes: The time period of the sample includes 1993-1995, 1997, 1999, 2001, 2003, 2005, and 2007. The dependent variable is employment status, which takes the value one if the individual is in paid full-time employment and zero otherwise. Social interaction is proxied by active group membership. Age represents the respondent's age. Higher degree, 1st degree, Hnc, A level, O level, Cse are all dummy variables which represents the six education levels. Married is a dummy variable which indicates one's marriage status. Ethnic is a dummy variable which takes the value one if the individual is white and zero otherwise. Anychild and Female are dummy variables, which stand for whether the respondent has any child or not and whether the respondent is female or not. Region represents the respondent's residence region, which takes values 1 (London), 2 (S England), 3 (N England), 4 (Wales), 5 (Scotland), 6 (N Ireland). Health is a dummy variable and represents the health status of the respondent. It takes the value one if the individual is currently experiencing anxiety and depression when answering the survey and zero otherwise.

Appendix 3. First stage regression results for some fixed effects IV regression model

A

	(1)	(2)	(3)
Norga	Coef.	Coef.	Coef.
Meannorga	0.488***	0.477***	0.495
	(0.020)	(0.034)	(0.025)
Age	0.004	0.002	0.005
	(0.004)	(0.007)	(0.005)
Age2	-0.00007	-0.00004	-0.0001
	(0.00005)	(0.0001)	(0.0001)
Higher degree	0.117	0.207	0.054
	(0.091)	(0.142)	(0.12)
1st degree	0.083	0.169	0.009
	(0.074)	(0.111)	(0.099)
Hnd, hnc, teaching	-0.025	0.088	-0.121
	(0.078)	(0.118)	(0.105)
A level	-0.066	-0.033	-0.09
	(0.065)	(0.101)	(0.086)
O level	0.041	0.087	0.014
	(0.065)	(0.099)	(0.088)
Cse	-0.0004	-0.148	0.079
	(0.109)	(0.178)	(0.139)
Married	-0.064***	-0.031	-0.085
	(0.015)	(0.022)	(0.02)
Anychild	0.0612***	0.101***	0.048
	(0.013)	(0.022)	(0.016)
Region	0.017	-0.002	0.03
	(0.019)	(0.03)	(0.024)
Health	-0.011	-0.025	0.005
	(0.021)	(0.029)	(0.031)
Constant	0.258**	0.264	0.259
	(0.111)	(0.187)	(0.139)
Obs	50375	19602	30773
Population size	12520	5614	6906
R-square	0.07	0.09	0.04
F test	58.07	20.96	38.38
Prob>F	0.000	0.000	0.000
Regression	Table 3.1.B (3)	Table 3.2 (5)	Table 3.2 (6)

* p<0.10, ** p<0.05, *** p<0.01

B.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
norga	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
meannorga	0.260***	0.216***	0.429***	0.590***	0.590***	0.506***	0.680***	0.341***
	(0.054)	(0.063)	(0.068)	(0.069)	(0.075)	(0.076)	(0.082)	(0.073)
Higher degree	0.421	0.157	-0.263	-0.224	-0.247	-0.189	0.445	0.402
	(0.401)	(0.566)	(0.437)	(0.460)	(0.469)	(0.453)	(0.612)	(0.572)
1st degree	0.006	0.283	-0.235	-0.155	0.241	-0.216	-0.155	-1.121
	(0.248)	(0.534)	(0.406)	(0.382)	(0.376)	(0.426)	(0.375)	(0.728)
Hnd, hnc, teaching	-0.022	-0.137	-0.034	-0.380	0.249	-0.033	-0.077	-0.443
	(0.232)	(0.534)	(0.374)	(0.420)	(0.404)	(0.426)	(0.393)	(0.591)
A level	0.019	0.110	-0.276	-0.367	-0.041	-0.697**	-0.205	-0.082
	(0.225)	(0.482)	(0.341)	(0.363)	(0.310)	(0.328)	(0.306)	(0.262)
O level	-0.037	0.086	-0.297	-0.194	-0.135	-0.252	0.241	0.199
	(0.230)	(0.518)	(0.333)	(0.353)	(0.301)	(0.285)	(0.314)	(0.302)
Cse	-0.239	0.615	-0.493	0.008	0.208	-0.287		
	(0.278)	(0.619)	(0.457)	(0.528)	(0.689)	(1.085)		
Married	0.002	-0.070*	0.022	-0.111	-0.095	-0.102	0.200*	-0.087
	(0.030)	(0.041)	(0.053)	(0.069)	(0.080)	(0.092)	(0.104)	(0.110)
Anychild	-0.011	0.046	-0.094**	-0.0001	0.022	0.032	0.146**	0.020
	(0.053)	(0.050)	(0.048)	(0.062)	(0.050)	(0.052)	(0.070)	(0.100)
Region	0.104	0.046	0.007	-0.057	0.134	-0.211*	0.168	-0.024
	(0.050)	(0.050)	(0.073)	(0.092)	(0.105)	(0.126)	(0.165)	(0.119)
Health	0.071	-0.068	-0.107	0.030	-0.051	0.068	-0.022	-0.118
	(0.061)	(0.073)	(0.066)	(0.075)	(0.074)	(0.075)	(0.076)	(0.080)
Constant	0.043	0.176	0.579	0.771	-0.028	1.409**	-0.433	0.748*
	(0.259)	(0.491)	(0.383)	(0.430)	(0.420)	(0.450)	(0.556)	(0.431)
Obs	6347	6519	6921	7073	6696	6329	5249	5241
Population size	3033	3547	3709	3767	3563	3271	2740	2174
R-square	0.010	0.004	0.015	0.014	0.015	0.005	0.014	0.009
F test	2.890	2.110	4.520	7.190	6.200	5.080	8.520	3.090
Prob>F	0.000	0.017	0.000	0.000	0.000	0.000	0.000	0.001
Regression	Table 3.3.C (1)	Table 3.3.C (2)	Table3. 3.C (3)	Table3.3 .C (4)	Table3.3 .C (5)	Table3.3 .C (6)	Table3.3 .C (7)	Table3.3. C (8)

* p<0.10, ** p<0.05, *** p<0.01

C.

	(1)		(2)		(3)
Pc1	Coef.	Pc2	Coef.	Pc3	Coef.
Meanpc1	0.484***	Meanpc2	0.586***	Meanpc3	0.593***
	(0.020)		(0.023)		(0.024)
Age	0.004***	Age	-0.002*	Age	-0.002
	(0.001)		(0.001)		(0.002)
Age2	-0.00005***	Age2	0.00002	Age2	-2.75E-06
	(0.00001)		(0.00001)		(0.00002)
Higher degree	0.032	Higher degree	0.078***	Higher degree	0.084**
	(0.020)		(0.027)		(0.037)
1st degree	0.011	1st degree	0.068***	1st degree	0.036
	(0.016)		(0.022)		(0.030)
Hnd, hnc, teaching	0.012	Hnd, hnc, teaching	0.016	Hnd, hnc, teaching	-0.025
	(0.017)		(0.023)		(0.032)
A level	-0.010	A level	0.048**	A level	-0.026
	(0.014)		(0.019)		(0.027)
O level	0.004	O level	0.047**	O level	0.016
	(0.014)		(0.019)		(0.027)
Cse	0.007	Cse	0.089***	Cse	-0.020
	(0.024)		(0.033)		(0.045)
Married	-0.003	Married	-0.008*	Married	-0.029***
	(0.003)		(0.004)		(0.006)
Anychild	0.024***	Anychild	-0.033***	Anychild	-0.010*
	(0.003)		(0.004)		(0.005)
Region	0.004	Region	-0.0004	Region	0.005
	(0.004)		(0.006)		(0.008)
Health	0.0005	Health	-0.007	Health	-0.002
	(0.005)		(0.006)		(0.009)
Constant	-0.052**	Constant	0.057*	Constant	0.178***
	(0.024)		(0.033)		(0.045)
Obs	50375		50375		50375
Population size	12520		12520		12520
R-square	0.1		0.03		0.05
F test	59.53		63.78		59.01
Prob>F	0.000		0.000		0.000
Regression	Table 3.4.A (7)		Table 3.4.A (8)		Table 3.4.A (9)

* p<0.10, ** p<0.05, *** p<0.01

D.

	(1)	(2)	(3)
Norga	Coef.	Coef.	Coef.
Meannorga	0.499***	0.457***	0.526***
	(0.024)	(0.038)	(0.03)
Age	0.004	0.004	0.004
	(0.005)	(0.008)	(0.006)
Age2	-0.0001	-0.0001	-0.0001
	(0.0001)	(0.0001)	(0.0001)
Higher degree	0.274**	0.334**	0.229*
	(0.103)	(0.158)	(0.135)
1st degree	0.168**	0.233*	0.108
	(0.084)	(0.128)	(0.003)
Hnd, hnc, teaching	0.076	0.141	0.02
	(0.09)	(0.137)	(0.121)
A level	0.042	0.05	0.036
	(0.078)	(0.12)	(0.103)
O level	0.125	0.169	0.094
	(0.076)	(0.115)	(0.104)
Cse	0.088	-0.036	0.167
	(0.127)	(0.202)	(0.163)
Married	-0.061***	-0.025	-0.09***
	(0.017)	(0.024)	(0.023)
Anychild	0.048**	0.079**	0.037**
	(0.015)	(0.024)	(0.019)
Region	0.028	0.034	0.023
	(0.022)	(0.034)	(0.028)
Health	-0.007	-0.017	0.005
	(0.024)	(0.032)	(0.038)
Constant	0.169	0.07	0.241
	(0.13)	(0.21)	(0.167)
Obs	40963	17159	23804
Population size	10885	5021	5864
R-square	0.055	0.074	0.041
F-test	45.3	15.81	30.54
Prob>F	0.000	0.000	0.000
Regression	Table 3.5 (3)	Table 3.6 (5)	Table 3.6 (6)

* p<0.10, ** p<0.05, *** p<0.01

E.

Norga	Coef.	Coef.	Coef.	Coef.	Coef.	Coef.
Meannorga	0.637***	0.803***	0.749***	0.935***	0.627***	0.74***
	(0.073)	(0.064)	(0.073)	(0.086)	(0.09)	(0.102)
Age	0.046	0.021**	0.024**	0.012	0.006	0.022
	(0.032)	(0.011)	(0.011)	(0.01)	(0.015)	(0.038)
Age2	-0.0003	-0.0002	-0.0002*	-0.0001	-0.0002	-0.0005
	(0.0004)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0004)
Higher degree	0.647	0.459**	0.638*	-0.603		
	(0.738)	(0.211)	(0.365)	(0.621)		
1st degree	0.249	0.393**	0.484**	-0.001	-0.112	
	(0.713)	(0.197)	(0.246)	(0.199)	(0.425)	
Hnd, hnc, teaching	-0.13	0.196	0.169	0.188	-0.047	
	(0.994)	(0.213)	(0.238)	(0.183)	(0.315)	
A level	0.101	0.188	0.186	-0.05	-0.24	0.371
	(0.762)	(0.198)	(0.227)	(0.153)	(0.215)	(0.432)
O level	0.086	0.283	0.222	0.021	-0.289	-0.348
	(0.685)	(0.201)	(0.224)	(0.148)	(0.194)	(0.31)
Cse		0.124	0.064	0.675**	-0.37	-0.822
		(0.345)	(0.312)	(0.246)	(0.274)	(0.633)
Married	-0.198**	-0.065*	-0.027	-0.099*	0.043	-0.242*
	(0.089)	(0.035)	(0.035)	(0.039)	(0.054)	(0.124)
Anychild	0.176**	0.021	0.034	0.049	-0.038	-0.128
	(0.08)	(0.029)	(0.035)	(0.032)	(0.046)	(0.104)
Region	-0.024	0.04	0.098	0.008	-0.221*	
	(0.072)	(0.037)	(0.066)	(0.093)	(0.126)	
Health	0.189	0.04	-0.04	-0.051	0.021	-0.117
	(0.16)	(0.05)	(0.049)	(0.062)	(0.068)	(0.151)
Constant	-1.081	-0.779**	-0.9**	-0.293	1.148**	0.366
	(0.949)	(0.318)	(0.365)	(0.377)	(0.506)	(0.806)
Obs	2403	14726	8824	8451	5186	936
Population size	1050	5139	3691	3264	2535	562
R-square	0.086	0.07	0.04	0.002	0.002	0.012
F-test	8.71	14.83	10.15	12.76	6.49	7.95
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000
Regression	Table 3.7 C (1)	Table 3.7 C (2)	Table 3.7 C (3)	Table 3.7 C (4)	Table 3.7 C (5)	Table 3.7 C (6)

* p<0.10, ** p<0.05, *** p<0.01

Appendix 4. Correlation between active memberships and employment status in the fixed effects IV model

	(1) feiv	(2) feiv	(3) feiv	(4) feiv	(5) feiv	(6) feiv	(7) feiv	(8) feiv
Political Party	0.097							
	(0.080)							
Trade union		1.396***						
		(0.058)						
environmental group			0.053					
			(0.066)					
parents association				0.247***				
				(0.042)				
tenants group					0.104**			
					(0.044)			
religious group						0.174***		
						(0.049)		
voluntary group							-1.146***	
							(0.062)	
pensioners organisation								0.700***
								(0.183)
Age	0.016***	0.012***	0.016***	0.014***	0.016***	0.016***	0.014***	0.016***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age2	-0.0002***	-0.0001***	-0.0002***	-0.0001***	-0.0002***	-0.0002***	-0.0002***	-0.0002***
	(0.00001)	(0.00002)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00002)	(0.00001)
Higher degree	0.044*	-0.031	0.046*	0.046*	0.043*	0.062**	0.055*	0.042*
	(0.024)	(0.043)	(0.024)	(0.025)	(0.024)	(0.025)	(0.032)	(0.024)
1st degree	0.021	-0.022	0.022	0.020	0.019	0.032	0.011	0.017
	(0.019)	(0.034)	(0.019)	(0.020)	(0.019)	(0.020)	(0.026)	(0.020)
Hnd, hnc, teaching	0.035*	0.017	0.035*	0.023	0.034*	0.039*	0.030	0.031
	(0.021)	(0.036)	(0.021)	(0.021)	(0.021)	(0.021)	(0.027)	(0.021)
A level	0.042**	0.007	0.042**	0.041**	0.041**	0.049***	0.023	0.041**
	(0.017)	(0.030)	(0.017)	(0.018)	(0.017)	(0.018)	(0.023)	(0.017)
O level	0.037**	0.009	0.038**	0.031*	0.037**	0.042**	0.026	0.032*
	(0.017)	(0.030)	(0.017)	(0.018)	(0.017)	(0.017)	(0.023)	(0.017)
Cse	-0.018	-0.065	-0.017	-0.022	-0.024	-0.006	-0.023	-0.022
	(0.029)	(0.051)	(0.029)	(0.030)	(0.029)	(0.029)	(0.038)	(0.029)
Married	0.016***	0.020***	0.016***	0.018***	0.015***	0.015***	0.010*	0.016***
	(0.004)	(0.007)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)
Anychild	-0.013***	-0.009	-0.013***	-0.029***	-0.014***	-0.016***	-0.010**	-0.013***
	(0.003)	(0.006)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.003)
Region	-0.014***	-0.012	-0.014***	-0.016***	-0.014***	-0.015***	-0.017***	-0.014***
	(0.005)	(0.009)	(0.005)	(0.005)	(0.005)	(0.005)	(0.007)	(0.005)
Health	-0.028***	-0.015	-0.028***	-0.027***	-0.027***	-0.027***	-0.020***	-0.028***
	(0.005)	(0.010)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)
Constant	0.599***	0.580***	0.598***	0.625***	0.595***	0.580***	0.713***	0.601***
	(0.029)	(0.051)	(0.029)	(0.030)	(0.029)	(0.030)	(0.039)	(0.029)
Sample Size	50375	50375	50375	50375	50375	50375	50375	50375
Respondent size	12520	12520	12520	12520	12520	12520	12520	12520
R-square	0.023	0.012	0.024	0.016	0.021	0.017	0.004	0.022

* p<0.10, ** p<0.05, *** p<0.01

Appendix 4. Continued

	(9) feiv	(10) feiv	(11) feiv	(12) feiv	(13) feiv	(14) feiv	(15) feiv	(16) feiv
Scout/guides organisations	0.927***							
	(0.082)							
Professional organisation		0.283***						
		(0.032)						
Other community group			0.083					
			(0.059)					
Social group				0.684***				
				(0.038)				
Sports club					0.756***			
					(0.039)			
Womens institute						0.355*		
						(0.206)		
Womens group							0.417***	
							(0.129)	
Other organisation								0.357***
								(0.040)
Age	0.016***	0.015***	0.016***	0.019***	0.020***	0.016***	0.016***	0.016***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)
Age2	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0002***	-0.0002***
	(0.00001)	(0.00001)	(0.00001)	(0.00002)	(0.00002)	(0.00001)	(0.00001)	(0.00001)
Higher degree	0.051*	-0.0004	0.046*	0.020	0.020	0.043*	0.048**	0.063**
	(0.027)	(0.025)	(0.024)	(0.032)	(0.041)	(0.024)	(0.024)	(0.026)
1st degree	0.032	0.002	0.022	-0.009	0.018	0.019	0.021	0.034
	(0.022)	(0.020)	(0.019)	(0.026)	(0.033)	(0.019)	(0.019)	(0.021)
Hnd, hnc, teaching	0.030	0.035*	0.036*	0.029	0.068*	0.033	0.036*	0.042*
	(0.023)	(0.021)	(0.021)	(0.027)	(0.035)	(0.021)	(0.021)	(0.022)
A level	0.042**	0.048***	0.043**	0.029	0.067**	0.041**	0.042**	0.048***
	(0.019)	(0.018)	(0.017)	(0.023)	(0.029)	(0.017)	(0.017)	(0.018)
O level	0.039**	0.042**	0.038**	0.013	0.026	0.038**	0.038**	0.046**
	(0.019)	(0.018)	(0.017)	(0.023)	(0.029)	(0.017)	(0.017)	(0.018)
Cse	-0.021	-0.019	-0.017	-0.068*	0.022	-0.019	-0.018	0.002
	(0.032)	(0.030)	(0.029)	(0.038)	(0.049)	(0.029)	(0.029)	(0.031)
Married	0.021***	0.017***	0.016***	0.022***	0.039***	0.015***	0.016***	0.017***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.007)	(0.004)	(0.004)	(0.004)
Anychild	-0.023***	-0.012***	-0.014***	-0.006	0.006	-0.014***	-0.014***	-0.014***
	(0.004)	(0.004)	(0.003)	(0.005)	(0.006)	(0.003)	(0.003)	(0.004)
Region	-0.016***	-0.016***	-0.014***	-0.020***	-0.016*	-0.013***	-0.014***	-0.016***
	(0.006)	(0.005)	(0.005)	(0.007)	(0.008)	(0.005)	(0.005)	(0.005)
Health	-0.027***	-0.030***	-0.027***	-0.024***	-0.024**	-0.028***	-0.029***	-0.025***
	(0.006)	(0.006)	(0.006)	(0.007)	(0.009)	(0.006)	(0.006)	(0.006)
Constant	0.590***	0.632***	0.597***	0.477***	0.256***	0.593***	0.594***	0.580***
	(0.032)	(0.030)	(0.029)	(0.039)	(0.052)	(0.029)	(0.029)	(0.031)
Sample Size	50375	50375	50375	50375	50375	50375	50375	50375
respondent size	12520	12520	12520	12520	12520	12520	12520	12520
r-square	0.011	0.023	0.024	0.004	0.019	0.019	0.019	0.016

* p<0.10, ** p<0.05, *** p<0.01

Appendix 5. First Stage regression results between each active membership and employment status

	orgaa	orgab	orgac	orgad	orgae	orgaf	orgag	orgap
meanorgaa	0.683***							
	(0.022)							
meanorgab		0.808***						
		(0.028)						
Meanorgac			0.714***					
			(0.028)					
Meanorgad				0.699***				
				(0.028)				
Meanorgae					0.811***			
					(0.028)			
Meanorgaf						0.457***		
						(0.022)		
Meanorgag							0.796***	
							(0.029)	
Meanorgap								1.057***
								(0.035)
Age	0.0006	0.003**	-0.0002	0.007***	0.002*	0.001	-0.002**	-0.0002
	(0.0004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.0002)
Age2	-6.24E-06	-0.00003**	3.78E-06	-0.0001***	-0.00002	-0.00001	0.00002**	2.10E-06
	(5.33E-06)	(0.00001)	(7.84E-06)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(2.39E-06)
Higher	0.016	0.057**	-0.007	0.002	0.026	-0.096***	0.008	0.004
degree	(0.01)	(0.025)	(0.014)	(0.024)	(0.019)	(0.024)	(0.019)	(0.004)
1st degree	0.005	0.037*	-0.003	0.01	0.022	-0.065***	-0.008	0.006*
	(0.008)	(0.02)	(0.012)	(0.019)	(0.015)	(0.019)	(0.015)	(0.004)
Hnd, hnc,	0.003	0.015	0.002	0.05**	0.013	-0.03	-0.006	0.006
teaching	(0.008)	(0.022)	(0.012)	(0.02)	(0.016)	(0.02)	(0.016)	(0.004)
A level	0.004	0.029	0.005	0.005	0.007	-0.041**	-0.018	0.002
	(0.007)	(0.018)	(0.01)	(0.017)	(0.014)	(0.017)	(0.013)	(0.003)
O level	0.003	0.025	0.008	0.03*	0.008	-0.029*	-0.011	0.007**
	(0.007)	(0.018)	(0.01)	(0.017)	(0.014)	(0.017)	(0.013)	(0.003)
Cse	0.003	0.041	-0.022	0.022	0.057**	-0.068**	-0.004	0.005
	(0.012)	(0.03)	(0.017)	(0.029)	(0.023)	(0.028)	(0.022)	(0.005)
Married	-0.001	-0.003	0.001	-0.01**	0.004	0.003	-0.005	-0.0008
	(0.002)	(0.004)	(0.002)	(0.004)	(0.003)	(0.004)	(0.003)	(0.0007)
Anychild	-0.001	-0.003	-0.003	0.063***	0.002	0.016***	0.003	-0.0004
	(0.001)	(0.004)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.001)
Region	0.003	-0.005	0.002	0.005	0.00004	0.003	-0.004	-0.0003
	(0.002)	(0.005)	(0.003)	(0.005)	(0.004)	(0.005)	(0.004)	(0.001)
Health	0.001	-0.008	0.001	-0.001	-0.002	-0.002	0.007	0.0001
	(0.002)	(0.006)	(0.003)	(0.005)	(0.004)	(0.005)	(0.004)	(0.001)
Constant	-0.022*	-0.055*	-0.001	-0.148***	-0.045**	0.045	0.06**	0.0002
	(0.012)	(0.03)	(0.017)	(0.029)	(0.023)	(0.029)	(0.022)	(0.005)
Obs	50375	50375	50375	50375	50375	50375	50375	50375
Population size	12520	12520	12520	12520	12520	12520	12520	12520
R-square	0.037	0.033	0.025	0.079	0.039	0.023	0.025	0.01
F-test	73.1	66.88	50.15	101.61	68.89	40.96	61.43	69.94
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Regression	Appendix C.8 (1)	Appendix C.8 (2)	Appendix C.8 (3)	Appendix C.8 (4)	Appendix C.8 (5)	Appendix C.8 (6)	Appendix C.8 (7)	Appendix C.8 (8)

Appendix 5. Continued

	orgaq	orgao	orgah	orgai	orgaj	orgak	orgal	orgam
meanorgaq	0.749***							
	(0.029)							
meanorgao		0.682***						
		(0.02)						
meanorgah			0.869***					
			(0.032)					
meanorgai				0.67***				
				(0.025)				
meanorgaj					0.635***			
					(0.026)			
meanorgak						0.641***		
						(0.033)		
meanorgal							0.783***	
							(0.03)	
meanorgam								0.79***
								(0.03)
Age	-0.001	0.001	-1.93E-06	-0.001	-0.005**	-0.0002	-2.67E-07	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.0003)	(0.0003)	(0.001)
Age2	5.36E-06	-5.98E-07	4.19E-07	9.43E-06	0.00003	2.95E-06	-3.06E-07	-8.30E-06
	(7.04E-06)	(0.00001)	(8.00E-06)	(0.00002)	(0.00002)	(3.30E-06)	(3.87E-06)	(0.00001)
Higher degree	-0.012	0.137***	0.002	0.042	0.028	0.007	-0.006	-0.04*
	(0.013)	(0.023)	(0.015)	(0.031)	(0.043)	(0.006)	(0.007)	(0.024)
1st degree	-0.015	0.063***	-0.002	0.053**	0.002	0.008*	0.004	-0.034*
	(0.011)	(0.018)	(0.012)	(0.025)	(0.035)	(0.005)	(0.006)	(0.02)
Hnd, hnc, teaching	0.001	-0.004	-0.01	0.016	-0.043	0.006	-0.001	-0.017
	(0.011)	(0.019)	(0.013)	(0.026)	(0.037)	(0.005)	(0.006)	(0.021)
A level	-0.004	-0.012	-0.012	0.025	-0.029	0.004	0.003	-0.017
	(0.009)	(0.016)	(0.011)	(0.022)	(0.031)	(0.004)	(0.005)	(0.017)
O level	-0.006	-0.012	0.0002	0.039*	0.019	0.0002	0.001	-0.024
	(0.009)	(0.016)	(0.011)	(0.022)	(0.031)	(0.004)	(0.005)	(0.017)
Cse	-0.001	0.005	-0.006	0.082**	-0.05	0.001	0.001	-0.052*
	(0.016)	(0.027)	(0.018)	(0.037)	(0.05)	(0.007)	(0.009)	(0.029)
Married	-0.006**	-0.006	-0.003	-0.008*	-0.033***	0.0004	-0.001	-0.005
	(0.002)	(0.004)	(0.002)	(0.005)	(0.007)	(0.001)	(0.001)	(0.004)
Anychild	0.011***	-0.005	0.003	-0.01**	-0.023***	0.001	0.001	0.004
	(0.002)	(0.003)	(0.002)	(0.004)	(0.006)	(0.001)	(0.001)	(0.003)
Region	0.002	0.007	0.001	0.005	0.001	-0.003**	-0.001	0.006
	(0.003)	(0.005)	(0.003)	(0.006)	(0.009)	(0.001)	(0.001)	(0.005)
Health	-0.002	0.007	-0.003	-0.005	-0.004	0.0004	0.004**	-0.007
	(0.003)	(0.005)	(0.003)	(0.007)	(0.01)	(0.001)	(0.002)	(0.006)
Constant	0.017	-0.054**	0.002	0.67***	0.635***	0.009	0.002	-0.017
	(0.016)	(0.027)	(0.018)	(0.025)	(0.026)	(0.007)	(0.01)	(0.029)
Obs	50375	50375	50375	50375	50375	50375	50375	50375
Population size	12520	12520	12520	12520	12520	12520	12520	12520
R-square	0.026	0.127	0.023	0.024	0.044	0.01	0.018	0.028
F-test	52.89	114.34	58.19	64.69	60.32	29.32	53.73	56.27
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Regression	Appendix C.8 (9)	Appendix C.8 (10)	Appendix C.8 (11)	Appendix C.8 (12)	Appendix C.8 (13)	Appendix C.8 (14)	Appendix C.8 (15)	Appendix C.8 (16)

* p<0.10, ** p<0.05, *** p<0.01

Appendix 6.
Principal component analysis

Principal components (eigenvectors) (blanks are abs(loading)<.3)

	comp1	comp2	comp3	unexplained
Political party	0.4217	0.3178		0.347
Trade union		0.4659		0.4566
Environmental group	0.4003			0.5271
Parents association				0.6346
Tenants group	0.3149			0.6508
Religious group		-0.4027		0.497
Voluntary group	0.367			0.6023
Professional organization			0.4735	0.4848
Other community group	0.3758			0.5777
Social group		0.6401		0.3905
Sports club			0.7703	0.2777

Scoring coefficients

	Comp 1	Comp2	Comp3
Political party	0.4217	0.3178	-0.1567
Trade union	0.2506	0.4659	0.086
Environmental group	0.4003	0.0773	-0.0756
Parents association	0.2875	-0.2428	0.1513
Tenants group	0.3149	0.0354	0.1191
Religious group	0.2893	-0.4027	0.1728
Voluntary group	0.367	-0.0926	-0.0481
Professional organization	0.2281	-0.1471	0.4735
Other community group	0.3758	-0.0653	-0.2331
Social group	-0.0114	0.6401	0.1454
Sports club	-0.0743	0.0968	0.7703

Kaiser-Meyer-Olkin measure of sampling adequacy

	KMO
Political party	0.7534
Trade union	0.6868
Environmental group	0.8072
Parents association	0.8104
Tenants group	0.8398
Religious group	0.761
Voluntary group	0.8281
Professional organization	0.7751
Other community group	0.822
Social group	0.5543
Sports club	0.5406
Overall	0.7675

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