Volunteering and perceived health. A European cross-countries investigation

Damiano Fiorillo and Nunzia Nappo

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Damiano Fiorillo
Department of Business and Economics,
"Parthenope" University of Naples
damiano.fiorillo@uniparthenope.it

Nunzia Nappo
Department of Political Science,
"Federico II" University of Naples
nunzia.nappo@unina.it

Abstract

In this paper, we study the effect of formal and informal volunteering on self-perceived health across 9 European countries after controlling, amongst other things, for socio-economic characteristics, social and cultural participation. We employ the 2006 wave of EU-SILC for estimating recursive trivariate probit models with instrumental variables. Our results show that although formal and informal volunteering are correlated with each other, they have a different impact on health. Formal volunteering has a significant positive effect on self-perceived health in the Netherlands, but none in other countries. By contrast, informal volunteering has a significant negative effect on self-perceived health in Austria, Finland, France, the Netherlands, Spain, and Italy.

JEL codes: I10, D64, P5**,** Z1

Keywords: self-perceived health, formal and informal volunteering, social and cultural participation, recursive trivariate probit model, European countries

1. Introduction

Volunteering, any activity to which people devote time to help others without asking for monetary compensation in return, has gained wide acceptance in social science and, more recently, in economics too, where formal volunteering has been shown to be good not only for its recipients, but also for the volunteers themselves. Among benefits of formal volunteering for volunteers, there are the effects: 1) in terms of investment in human capital, - volunteering improves workers' job prospects and income (Hackl et al. 2007; Bruno and Fiorillo 2015); 2) on well-being (Thoits and Hewitt 2001; Meier and Stutzer 2008; Nappo 2010; Binder and Freytag 2013) and 3) on health. As regards this last benefit, a large strand of the socio-medical literature has investigated the relationship between formal volunteering and health. Such literature suggests that volunteers are more likely to enjoy good physical and mental health (Moen et al. 1992; Musick et al. 1999; Post 2005), volunteers have lower rates of mortality (Musick and Wilson 2008; Konrath et al. 2011), volunteers declare better self-reported health (Carlson 2004; Kumar et al. 2012) and psychological well-being (Musick and Wilson 2003; Pilivian and Siegel 2007) than non-volunteers. Recently, also economists started studying the impact of formal volunteering on health finding a positive (Borgonovi 2008) and causal relationship (Schultz et al. 2008) between formal volunteer activities and self-reported health.

Economic and public health literature suggest several potential pathways for the influence of formal volunteering on health. First, people enjoy volunteering doing the required task in itself, and they receive a "warm glow" from contributing with a time donation (Andreoni 1990). The knowledge of contributing to a good cause is internally self-rewarding, increases self-worth and self-esteem and, in turn, improves mental health (Wilson and Musick 1999). Second, people volunteer in order to receive a by-product of volunteering: improvements in workers' career prospects and wage premium (Menchik and Weisbrod 1987; Day and Devlin 1998). Both the possibility of role enhancement and wage premium connected to volunteering may increase job satisfaction (Fiorillo and Nappo 2014) which, in turn, produces significant positive effects on health (Faragher et al. 2005). Third, volunteering is a behaviour that allows people to expand social interactions, to improve social skills and to get social support (Clotfelter 1985; Schiff 1990; Prouteau and Wolff 2006). All this, in turn, produces positive effects on social integration with positive effects on physical and mental health (Musick and Wilson 2003; Li and Ferraro 2005).

Table 1. Rates of participation in formal and informal volunteering for some European countries

Country	Formal volunteering (%)	Informal volunteering (%)
Austria	28	56
Denmark	20	53
Finland	27	55
France	25	35
Greece	4	30
Italy	25	56
Netherlands	37	57
Spain	17	50
Sweden	13	51

Source: World Giving Index (WGI) 2013 Report

While most studies focused just on one category of volunteering, namely *formal volunteering*, i.e. any unpaid contribution of time to activities of formal organisations, *informal volunteering*, i.e. any assistance given directly to non-household individuals - such as helping a friend or neighbour, received less attention. Nevertheless, as Table 1 shows, informal volunteering is as relevant as formal volunteering and cross-country differences in (formal and informal) volunteering characterize European countries. Moreover, in economic and public health studies, the vast majority of existing studies on formal volunteering and health focuses on a single country, while cross-country comparisons are very few (Haski-Leventhal 2009; Kumar et al. 2012).

This paper develops Fiorillo and Nappo's (2015) previous analysis along several directions. First, it examines simultaneously the impact of formal and informal volunteering on self-perceived health, after controlling, amongst other things, for human capital, social and cultural participation. Second, the paper compares 9 European countries characterized by different Welfare State regimes: social-democratic (Nordic countries: Denmark, Finland, Sweden), conservative (Continental countries: Austria, France, the Netherlands) and Mediterranean (Spain, Greece, Italy). Third, it analyses the determinants of formal and informal volunteering considering that formal and informal volunteering activities might be each other complementary (Hank and Stuck 2008) and that national differences in the rates of formal and informal volunteering can be explained by differences in human, social and cultural factors (Wilson and Musick 1997; Plagnol and Huppert 2010). Finally, the paper addresses reverse causation, i.e. the circular relationship likely to exist between volunteering and health: not only unpaid work influences health but also the vice versa can be true.

To pursue its aims, the paper employs the 2006 wave of EU-SILC data, with plenty of information on measures of volunteering, social and cultural participation for a sample of

European countries, and employs, as empirical methodology, a recursive trivariate probit model that models the joint determination of self-perceived health, formal volunteering and informal volunteering. The model is recursive since formal and informal volunteering variables appear on the right-hand side of the self-perceived health equation. In so doing, the paper treats formal and informal volunteering as endogenous variables and using social participation as instrumental variables.

Results indicate that individuals who supply formal volunteering are more likely to declare better perceived health in the Netherlands while respondents who informally help others are more likely to declare worse perceived health in Austria, Finland, France, the Netherlands, Spain, and Italy.

The paper is organised as follows: section 2 describes the definition of volunteering adopted in the paper as well as the mechanism through which volunteering may affect health. Sections 3 and 4 present the dataset and the empirical strategy. Section 5 shows the empirical results. Section 6 concludes.

2. Volunteering and health

2.1 Definition of volunteering

In sociological and political sciences, Snyder and Omoto (2008, 3-5) provide definitional issues, defining volunteering as "freely chosen and deliberate helping activities that extend over time, are engaged in without expectation of reward or other compensation and often through formal organizations". The above definition of volunteering highlights the debate among sociologists and political scientists regarding: whether "remunerated" work is truly volunteering (Smith 1994); whether or not the definition of volunteering should include reference to intentions (Wilson 2000); whether volunteering should be more formalized and public (Snyder and Omoto 1992) or should include helping behaviors (Cnaan and Amrofell 1994). In the economic science, economists view volunteering as one of the most relevant pro-social activities (Meier and Stutzer 2008) considering it within the context of a labor-leisure decision: volunteer labor supply (see Ziemek 2006).

This paper fits into the debate of the sociological, political and economic sciences. Following Wilson and Musick (1999), we define volunteering as any activity to which people devote time to help others without asking for monetary compensation in return. This definition emphases the economic characteristics of volunteering: i) labour supply without a monetary

reward (unpaid work); ii) commitment of time and effort; iii) altruism is one of the possible motivations explaining why people decide to help others.

Moreover, we share the classification of this activity according to the level of its formality (Cnaan and Amrofell 1994; Wilson and Musick 1997). Therefore, we divide volunteering in *formal volunteering*, unpaid work or free activity undertaken within and or through any kind of organizations, and *informal volunteering*, unpaid work carried out directly in favor of non-household individuals such as helping a neighbor.

2.2 Mechanisms

Potential mechanism through which volunteering benefits health may be identified linking the economic determinants of volunteering to the social and psychological effects of volunteering so as classified by the literature. The parallel study of the two strands of literature suggests that, when motivations, which push people to volunteer, are largely fulfilled, volunteering can positively affect health.

In the current study, we are going to consider two determinants of volunteering: the relational motivation and the intrinsic motivation (see Fiorillo 2011; Fiorillo and Nappo 2016). The former because volunteering produces relations in many ways: 1) among volunteers, 2) between volunteers and beneficiaries of their activities, 3) between volunteers and representatives of the institutions with which often volunteers interact, 4) between volunteers and the collectivity within which they volunteer. The latter (the intrinsic motivation) because it seems that people informally volunteer mainly driven by altruistic reasons. Moreover, different from formal volunteering, informal volunteering is generally performed on an individual basis, and therefore for informal volunteers the opportunity of sharing relationships (for instance within the organization with other volunteers) are fewer than for formal volunteers.

Making friends (i.e. the relational motivation) is one of the determinants of volunteering: volunteering is an activity generally performed in groups; it is a way to expand one's personal network (Clotfelter 1985; Schiff 1990; Prouteau and Wolff 2006). Frequent interaction with a wide range of others increases the chances of finding social support, useful information and helpful social contacts (Lin et al. 1999; Musick and Wilson 2003). There is a link between this strand of the literature and the social integration theory, following which people gain mental, emotional and physical benefits when they think about themselves as a contributing, accepted part of society. Without such a sense of connection, people can experience depression, isolation and physical illness (Musick and Wilson 2003; Li and Ferraro 2005; Choi and Boham 2007).

Another reason why people volunteer is that volunteering may contribute to make them feel "good" (Andreoni 1990). Following this approach, volunteering is an ordinary consumption good (Menchik and Weisbrod 1987; Degli Antoni 2009) from which individuals receive a direct utility: volunteers bear utility not only from the goods they contribute to provide but also from the act of volunteering in itself. In this case, volunteering gives people the opportunity to be recognized as «good» by society. Thus, volunteering impacts positively on volunteers' social recognition: volunteers are recompensed with gratitude and admiration and are thought as altruists by the others. Consequently, being engaged in such activities may promote feelings of self-worth and self-esteem. In addition, providing help is a self-validating experience.

However, as said, since informal volunteering is not performed via official groups but on an individual basis, standard mechanisms of compensation that work for formal activities could not work for informal volunteering, which is a kind of activity performed to help, in a private, autonomous and unorganized way, friends, neighbours, and kin (Li and Ferraro 2005). Reasons why informal volunteering could not benefit health may be found in the very nature of such activity. Informal volunteering is not performed via official groups but on an individual basis, and there is not a process of recognition of volunteers' activities by society, therefore, the potential channel of "social recognition" might be weakened. Then, generally, informal helpers have fewer opportunities to be appreciated by society than formal volunteers, who volunteering in well-known organizations, gain visibility with its advantages also in terms of health. In addition, helping other informally give volunteers the awareness about the state of need of people who they help and volunteers perceiving that such people, sometimes, do not have other ways to be supported make them feel responsible about their social role. This could mean an aggravation of volunteers' stress instead of its alleviation as it happens for formal voluntary activities.

For the above arguments, we set up the following empirical hypotheses:

H1: Formal volunteering influences positively self-perceived health, because social networks and altruism imply, through social integration theory and social recognition, better physical and psychological health.

H2: Informal volunteering influences self-perceived health, but the sign is uncertain because the psychological benefits, related to the relational and altruistic motivations, could be offset by the lower volunteers' social recognition and higher depressive symptoms coming from such activity that can become demanding.

3. Data and descriptive statistics

We use data from the Income and Living Conditions Survey carried out by the European Union's Statistics on Income and Living Conditions (EU-SILC) in 2006. The EU-SILC database provides comparable multidimensional data on income, social exclusion and living conditions in European countries. The 2006 wave of EU-SILC contains cross-sectional data on income, education, health, demographic characteristics, housing features, neighbourhood quality, size of municipality, and social and cultural participation. Information on social and cultural participation are not provided in other waves of the survey and regards respondents aged 16 and above. Hence, no panel dimension is available.

Health measure

Our dependent variable is self-perceived health, collected through personal interviews or registers, and assessed through the question: "In general, would you say that your health is very good, good, fair, poor, or very poor?". Responses are coded into a binary variable, which is equal to 1 in cases of good or very good health, 0 otherwise. Self-perceived health (*SPH*) is widely used in the literature as a good proxy for health and, despite its very subjective nature, previous studies have shown its correlation with objective health measures such as mortality (Idler and Benyamini 1997).

Volunteering

We consider formal and informal volunteering. Formal volunteering (*ForVol*) is a dummy variable equal to 1 if the respondent, during the previous twelve months, worked unpaid for charitable organisations, groups or clubs (it includes unpaid work for churches, religious groups and humanitarian organisations and attending meetings connected with these activities), 0 otherwise. Informal volunteering (*InfVol*) is a binary variable equal to 1 if the respondent, during the previous twelve months, undertook (private) voluntary activities to help someone, such as cooking for others, taking care of people in hospitals/at home, taking people for a walk. It excludes any activity that the respondent undertook for his/her household, in his/her work or within voluntary organisations.

Control variables

In order to account for other factors that might influence simultaneously health status and formal and informal volunteering, we include in the analysis a full set of control variables: age, gender, marital status, education, the respondents' country of birth, the number of individuals

living in the household, the natural logarithm of total disposal household income, unmet need for medical examination and treatment, tenure status and self-defined current economic status. We also control for housing features, neighbourhood quality and size of municipality. We further control for a number of other activities which imply a certain degree of relational engagement, such as, recreational, professional, meetings with friends and several forms of cultural consumption, i.e. the frequency with which interviewees go to the cinema, live performances (plays, concerts, operas), cultural sites and sporting events.

Descriptive statistics

Table A.1, in Appendix A, describes all variables employed in the empirical analysis. We consider 9 European countries one by one: Austria (AT), Denmark (DK), Spain (ES), Finland (FI), France (FR), Greece (GR), Italy (IT), the Netherlands (NL), and Sweden (SE).

The weighted summary statistics for the full sample, ForVol and InfVol sub-samples across the 9 European countries are reported in Tables B.1, B.2 and B.3, Appendix B. We find helpful to comment descriptive statistics (mean) by Nordic countries (DK, FI, SE), Continental countries (AT, FR, NL) and Mediterranean countries (ES, GR, IT).

On average, respondents rate their health as good and/or very good, except for IT and AT. Formal and formal volunteering differ substantially among European countries. Formal volunteering is the lowest in FR and GR where respectively only 1% and 3% of respondents supply voluntary activities in charitable organisations, groups or clubs. By contrast, in the NL 32% of respondents perform formal volunteer work. The NL has the highest number of informal volunteers too. On the other end of the range is DK, where only 3% of respondents supply informal voluntary activities. On average, with few exceptions across European countries, individuals who supply formal volunteering are female, married, older, with tertiary education, retired and with a more social and cultural participation, Indeed, people who informally help others are female, married, younger, with secondary education and less social and cultural participation.

4. Empirical models

Our empirical strategy involves a recursive trivariate probit model that models the joint determination of self-perceived health, formal volunteering and informal volunteering. The model is recursive since formal and informal volunteering variables appear on the right-hand

side of the self-perceived health equation. In so doing formal and informal volunteering are treated as endogenous variables[1]. The model is (see Green 2012, ch. 17.5.5):

$$H_{ij}^{*} = \alpha + \beta FV_{ij} + \theta IV_{ij} + X_{ij}\varphi + \varepsilon_{ij}\,,\ H_{ij} = 1 \text{ if } H_{ij}^{*} > 0,\ 0 \text{ otherwise,}$$

$$FV_{ij}^{*} = \omega + X_{ij}^{'}\chi + Z_{ij}^{'}\delta + \mu_{ij}\,,\ FV_{ij} = 1 \text{ if } FV_{ij}^{*} > 0,\ 0 \text{ otherwise,} \qquad (1)$$

$$IV_{ij}^{*} = \sigma + X_{ij}^{''}\gamma + Z_{ij}^{''}\pi + \eta_{ij}\,,\ IV_{ij} = 1 \text{ if } IV_{ij}^{*} > 0,\ 0 \text{ otherwise,}$$

with

$$\begin{pmatrix} \varepsilon_i \\ \mu_i \\ \eta_i \end{pmatrix} \sim \mathrm{N}_3, \left[\begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho_{HFV} & \rho_{HIV} \\ \rho_{FVH} & 1 & \rho_{FVIV} \\ \rho_{IVH} & \rho_{IVFV} & 1 \end{pmatrix} \right]$$

where, in the first simultaneous-equation, H_{ij}^{*} is the latent variable of self-perceived health for individual *i* in country *j*; FV_{ij} is formal volunteering provided by individual *i* in country *j*; IV_{ij} is informal volunteering performed by individual *i* in country *j*; X_{ij} is a matrix of control variables that are known to influence self-perceived health; ε is a random-error term. $\alpha, \beta\ \theta$, φ are parameters to be estimated.

In the second simultaneous-equation, FV_{ij}^{*} is the latent variable of formal volunteering; $X_{ij}^{'}$ is a matrix of variables that are determinates of formal volunteering; $Z_{ij}^{'}$ is the instrumental variable and μ is a random-error term. ω, χ, δ are parameters to be estimated.

In the third simultaneous-equation, IV_{ij}^{*} is the latent variable of informal volunteering; $X_{ij}^{''}$ is a matrix of variables that are determinates of informal volunteering; $Z_{ij}^{''}$ is the instrumental variable and μ is a random-error term. σ, γ, π are parameters to be estimated.

The error terms is distributed as a normal 3-variete, with zero mean and variance-covariance matrix with values equal to 1 on the main diagonal and correlations ρ outside. Since endogeneity would result in correlation between the unobserved components of self-perceived health and volunteering, the null hypothesis of absence of bias can then be tested by considering

[1] It might be that the same unobserved data-generating process in fact determines both self-perceived health and volunteering. For example, individuals who volunteer might be characterized by higher aspirations and be more prone to report good self-perceived heath. The possibility that such mechanisms take place should be taken into account when estimating the effect of volunteering on self-perceived health probabilities.

the joint significance of correlation coefficients between the error terms of the three probit equations.

Identification of β and θ in (1) requires exclusion restrictions in terms of variables entering Z but not X, in other words variables which affect volunteering but which have no additional effect on self-perceived health after volunteering has been controlled for. As instruments for volunteering, we employ two variables of social participation regarding the use of time. In particular, we include a dummy indicating whether the individual participated in activities of environmental organizations, civil rights groups, peace groups, etc… (*participation in other organizations*) as instrument for formal volunteering and a dummy indicating whether the individual participated in activities related to church, religious associations (*religious participation)* as instrument for informal volunteering[2]. Hence, the volunteering equations include the X matrix plus the instrument Z[3].

5. Results

Tables from 2 to 4 show the trivariate probit estimation of self-perceived health for the 9 European countries considered. We find helpful to comment the results grouping countries by Nordic countries (DK, FI, SE), Continental countries (AT, FR, NL) and Mediterranean countries (ES, GR, IT). For each country, the first column shows coefficients and the second column presents the standard errors, which are corrected for heteroskedasticity.

The bottom lines of the Tables report results from testing the various hypotheses underlying the model. The row labelled "Endogeneity test" reports the outcome of the test for the joint significance of the correlation coefficients between unobservable of the three equations. Results show that the null hypothesis of absence of bias can be rejected at usual confidence levels for all the nine self-perceived health equations. This implies the necessity of controlling for the determinants of formal and informal volunteering when estimating their impact on self-perceived health. The "Instruments test 1" row shows the exclusion of the instruments from the self-perceived health equation. As we can see, the null hypothesis of insignificance of the variables cannot be rejected at usual confidence levels. Finally, the "Instruments test 2" row shows that the two variables are simultaneously non-significant in the volunteering equations,

[2] As suggested by the econometric literature, the choice of instruments has been made selecting social participation variables that in the samples are statistically correlated with volunteering variables and contemporaneously uncorrelated with our dependent variable.

[3] In order to assess the validity of instruments, we use functional form as identifying restriction and test the joint significance of the instruments in the headline equation and in the volunteering equations.

Table 2. Trivariate probit estimations: SPH in Nordic countries

	DK		FI		SE	
ForVol	-0.160	0.250	-0.126	0.163	0.044	0.249
InfVol	0.295	0.561	-0.370**	0.166	-0.289	0.212
Female	-0.008	0.044	0.131***	0.032	-0.147	0.042
Married	-0.015	0.067	-0.118**	0.048	0.040	0.061
Separated/divorced	0.024	0.103	-0.220***	0.076	-0.037	0.098
Widowed	0.025	0.088	-0.020	0.058	0.049	0.073
Age 31- 50	-0.406***	0.089	-0.429***	0.064	-0.407***	0.075
Age 51- 64	-0.647***	0.103	-0.617***	0.076	-0.633***	0.093
Age > 65	-0.489***	0.134	-0.879***	0.102	-0.450***	0.142
Lower secondary edu					0.169*	0.089
Secondary edu	0.162***	0.049	0.090**	0.039	0.269***	0.073
Tertiary edu	0.367***	0.061	0.277***	0.046	0.405***	0.081
Household size	0.015	0.027	0.037**	0.016	-0.019	0.021
EU birth	-0.087	0.171	-0.054	0.182	-0.160*	0.085
OTH birth	-0.185	0.122	0.185	0.208	-0.188**	0.080
Household income (ln)	0.153***	0.053	0.080***	0.029	0.092**	0.038
Uneed meet f.m.e.	-0.525***	0.200	-0.699***	0.092	-0.740***	0.053
Homeowner	0.193***	0.053	-0.000	0.041	0.100**	0.049
Employed part time	-0.277***	0.074	-0.176***	0.059	-0.434***	0.061
Unemployed	-0.456***	0.121	-0.373***	0.066	-0.615***	0.103
Student	0.012	0.113	0.030	0.083	-0.193**	0.098
Retired	-0.524***	0.089	-0.351***	0.078	-0.802***	0.114
Disabled	-1.590***	0.109	-1.139***	0.073	-1.779***	0.104
Domestic tasks	-0.353	0.250	0.066	0.103	-0.558**	0.257
Inactive	-0.434***	0.151	-0.028	0.164	-0.181	0.248
Home warm	0.169**	0.074	0.161*	0.093	0.309***	0.115
Home dark problem	-0.241***	0.076	-0.164**	0.070	-0.227***	0.075
Densely populated area	0.185***	0.054	0.059	0.046	-0.013	0.053
Intermediate area	0.055	0.050	0.078*	0.046	0.093	0.061
Political parties/t.u.	-0.101	0.065	0.035	0.051	0.018	0.076
Professional part.	0.204***	0.076	-0.053	0.053	0.230***	0.079
Recreational part.	0.117*	0.069	0.148***	0.036	0.127**	0.052
Meetings with friends	0.124***	0.045	0.149***	0.034	0.146***	0.043
Cinema	-0.070	0.045	0.063*	0.034	0.071	0.043
Live performance	0.095**	0.044	0.098***	0.032	0.074*	0.042
Cultural site	0.042	0.044	0.089***	0.033	0.099**	0.043
Sport events	0.053	0.060	0.038	0.038	0.200***	0.056
Regional dummies			Yes			
Obs.	5468		8999		6062	
Log likelihood	-4841.70		-13708.35		-8330.67	
Endogeneity test: LR test	$\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0^{(a)}$		$\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0^{(b)}$		$\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0^{(c)}$	
	Chi2 (d.f. = 3) = 89.26 (0.00)		Chi2 (d.f. = 3) = 38.06 (0.00)		Chi2 (d.f. = 3) = 73.83 (0.00)	
Instruments test 1[(a)]:	Chi2 (d.f.= 2) = 0.33 (0.85)		Chi2 (d.f.= 2) = 4.62 (0.10)		Chi2 (d.f.= 2) = 0.92 (0.63)	
Instruments test 2[(b)]:	Chi2 (d.f.= 2) = 94.07 (0.00)		Chi2 (d.f.= 2) = 158.02 (0.00)		Chi2 (d.f.= 2) = 158.31 (0.00)	

Notes: The estimator use a GHK simulator with 30 random draws for DK, 50 random draws for FI and 30 random draws for SE.
The symbols ***, **, * denote that the coefficient is statistically different from zero at 1, 5 and 10 percent.
(a) Test significance of instruments in self-perceived health equation
(b) Test significance of instruments in volunteering equations

Table 3. Trivariate probit estimations: SPH in Continental countries

	AT		FR		NL	
ForVol	-0.230	0.151	0.207	0.291	0.311***	0.104
InfVol	-0.226*	0.129	-0.213*	0.114	-0.678***	0.208
Female	0.140***	0.034	-0.000	0.024	0.109***	0.040
Married	-0.058	0.049	-0.004	0.035	0.016	0.055
Separated/divorced	-0.314***	0.065	-0.125**	0.054	-0.104	0.072
Widowed	-0.094	0.067	-0.106**	0.049	-0.054	0.070
Age 31- 50	-0.484***	0.062	-0.467***	0.048	-0.141**	0.070
Age 51- 64	-0.967***	0.071	-0.765***	0.055	-0.249***	0.083
Age > 65	-1.161***	0.082	-1.199***	0.068	-0.490***	0.092
Lower secondary edu			0.198***	0.039	0.185***	0.060
Secondary edu	0.315***	0.035	0.223***	0.032	0.301***	0.061
Tertiary edu	0.518***	0.050	0.423***	0.041	0.423***	0.065
Household size	-0.037***	0.014	0.022**	0.011	0.060***	0.020
EU birth	0.118	0.073	-0.085	0.057	-0.215	0.133
OTH birth	-0.067	0.053	-0.116***	0.042	-0.128	0.083
Household income (ln)	0.213***	0.029	0.137***	0.024	0.090**	0.037
Uneed meet f.m.e.	-0.836***	0.101	-0.393***	0.057	-0.827***	0.120
Homeowner	0.089***	0.033	0.071***	0.027	0.172***	0.039
Employed part time	0.052	0.057	-0.190***	0.042	-0.223***	0.054
Unemployed	-0.383***	0.078	-0.314***	0.048	-0.090	0.139
Student	0.484***	0.122	0.025	0.069	0.093	0.110
Retired	-0.390***	0.051	-0.380***	0.044	-0.389***	0.077
Disabled	-1.646***	0.291	-0.881***	0.058	-1.910***	0.124
Domestic tasks	-0.005	0.057	-0.213***	0.056	-0.486***	0.072
Inactive	-0.279**	0.139	-0.707***	0.094	-0.334***	0.108
Home warm	0.142*	0.073	0.310***	0.045	0.378***	0.123
Home dark problem	-0.180***	0.047	-0.212***	0.034	-0.145***	0.044
Densely populated area	0.056	0.040	0.006	0.035		
Intermediate area	-0.070	0.036	0.021	0.032		
Political parties/t.u.	0.082	0.067	-0.080	0.067	-0.082	0.079
Professional part.	0.023	0.079	-0.092	0.108	0.145***	0.055
Recreational part.	0.196***	0.039	0.185***	0.032	0.098***	0.034
Meetings with friends	0.296***	0.029	0.108***	0.024	0.103***	0.035
Cinema	0.086**	0.041	0.029	0.027	0.111***	0.038
Live performance	-0.010	0.038	0.130***	0.025	0.100***	0.035
Cultural site	0.094**	0.040	0.054**	0.026	0.079**	0.036
Sport events	0.176***	0.050	0.077**	0.033	-0.015	0.047
Regional dummies	Yes		Yes		Yes	
Obs.	11595		18231		8608	
Log likelihood	-14385.49		-17913.99		-14093.63	
Endogeneity test: LR test $\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$			$\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$		$\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$	
	Chi2 (d.f. = 3) = 194.55 (0.00)		Chi2 (d.f. = 3) = 37.30 (0.00)		Chi2 (d.f. = 3) = 104.22 (0.00)	
Instruments test 1[(a)]: Chi2 (d.f.= 2) = 0.01 (0.99)			Chi2 (d.f.= 2) = 3.18 (0.82)		Chi2 (d.f.= 2) = 0.14 (0.93)	
Instruments test 2[(b)]: Chi2 (d.f.= 2) = 187.86 (0.00)			Chi2 (d.f.= 2) = 152.01 (0.00)		Chi2 (d.f.= 2) = 674.63 (0.00)	

Notes: The estimator use a GHK simulator with 50 random draws for AT, 50 random draws for FR and 50 random draws for NL. The symbols ***, **, * denote that the coefficient is statistically different from zero at 1, 5 and 10 percent.
(a) Test significance of instruments in self-perceived health equation
(b) Test significance of instruments in volunteering equations

Table 4. Trivariate probit estimations: SPH in Mediterranean countries

	ES		GR		IT	
ForVol	-0.017	0.086	-0.082	0.215	0.058	0.068
InfVol	-0.268**	0.110	-0.143	0.292	-0.139*	0.075
Female	-0.041*	0.024	-0.001	0.040	-0.049***	0.018
Married	0.013	0.030	0.048	0.066	-0.094***	0.022
Separated/divorced	-0.204***	0.041	-0.187**	0.078	-0.259***	0.031
Widowed	-0.132*	0.074	-0.410***	0.123	-0.140***	0.054
Age 31- 50	-0.466***	0.038	-0.432***	0.086	-0.475***	0.029
Age 51- 64	-0.886***	0.046	-0.978***	0.092	-0.956***	0.033
Age > 65	-1.171***	0.053	-1.459***	0.100	-1.436***	0.039
Lower secondary edu	0.122***	0.026	0.296***	0.055	0.217***	0.021
Secondary edu	0.223***	0.030	0.353***	0.046	0.355***	0.022
Tertiary edu	0.357***	0.031	0.446***	0.065	0.493***	0.031
Household size	0.017**	0.008	0.031*	0.016	0.055***	0.007
EU birth	0.057	0.095	0.152	0.178	0.292***	0.064
OTH birth	0.034	0.049	-0.130*	0.075	0.287***	0.040
Household income (ln)	0.039***	0.027	0.107***	0.028	0.412***	0.012
Uneed meet f.m.e.	-0.314***	0.036	-0.716***	0.057	-0.578***	0.029
Homeowner	0.036	0.027	-0.049	0.048	-0.017	0.017
Employed part time	--0.121***	0.044	-0.107***	0.028	-0.077**	0.032
Unemployed	-0.192***	0.039	-0.274***	0.086	-0.073**	0.035
Student	0.192***	0.059	0.107	0.139	0.148***	0.044
Retired	-0.431***	0.038	-0.615***	0.055	-0.212***	0.025
Disabled	-1.751***	0.083	-2.325***	0.192	-1.364***	0.087
Domestic tasks	-0.257***	0.033	-0.396***	0.057	-0.073***	0.025
Inactive	-0.439***	0.044	-0.602***	0.132	-0.275***	0.036
Home warm	0.308***	0.033	0.172***	0.045	0.109***	0.026
Home dark problem	-0.248***	0.024	-0.239***	0.037	-0.288***	0.017
Densely populated area	-0.008	0.026	-0.077*	0.042	0.048**	0.019
Intermediate area	-0.005	0.028	-0.023	0.059	0.038**	0.018
Political parties/t.u.	-0.070	0.049	0.100	0.095	-0.108***	0.035
Professional part.	0.020	0.048	0.062	0.098	0.112***	0.034
Recreational part.	0.112***	0.030			0.079***	0.029
Religious part.			0.103**	0.040		
Meetings with friends	0.173***	0.020	0.211***	0.039	0.205***	0.015
Cinema	0.112***	0.024	0.057	0.053	0.129***	0.018
Live performance	0.061**	0.025	0.123*	0.050	0.095***	0.019
Cultural site	0.069***	0.023	0.195***	0.071	0.047**	0.020
Sport events	0.129***	0.014	0.106	0.066	0.062***	0.023
Regional dummies	Yes		Yes		Yes	
Obs.	25755		12008		43808	
Log likelihood	-37030.09		-10895.94		-55034.87	
Endogeneity test: LR test	$\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$[(a)]		$\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$[(b)]		$\rho_{FVH} = \rho_{IVH} = \rho_{IVFV} = 0$[(c)]	
	Chi2 (d.f. = 3) = 118.19 (0.000)		Chi2 (d.f. = 3) = 167.39 (0.000)		Chi2 (d.f. = 3) = 446.89 (0.000)	
Instruments test 1[(a)]:	Chi2 (d.f.= 2) = 3.54 (0.17)		Chi2 (d.f.= 2) = 0.38 (0.20)		Chi2 (d.f.= 2) = 1.17 (0.56)	
Instruments test 2[(b)]:	Chi2 (d.f.= 2) = 1039.48 (0.00)		Chi2 (d.f.= 2) = 217.50 (0.00)		Chi2 (d.f.= 2) = 1272.29 (0.00)	

Notes: The estimator use a GHK simulator with 50 random draws for ES, 30 random draws for GR and 100 random draws for IT. The symbols ***, **, * denote that the coefficient is statistically different from zero at 1, 5 and 10 percent.
(a) Test significance of instruments in self-perceived health equation
(b) Test significance of instruments in volunteering equations
(c) For Greece, the instrument for formal volunteering is *recreational participation*. See Table A1 for its definition.

the null hypothesis being overwhelmingly rejected. Overall, these tests support the validity of the social participation variables as instruments for volunteering.

Results about the effects of volunteering on self-perceived health suggest that commitment in different volunteer activities such as formal and informal volunteering may lead to different health outcomes.

As regards formal volunteering, in spite of the first hypothesis, coefficients are not statistically significant, except for the Netherlands regarding which the coefficient is significant at 1 percent level. For the other European countries, there are not statistically significant differences as regards self-perceived health between individuals who supply formal voluntary work and individuals who do not. Hence, except for the Netherlands, across the other 8 European countries considered, formal volunteering does not increase the probability of declaring good /very good perceived health. Anyway, both findings are consistent with previous studies. The Netherlands result is in line with Schultz et al. (2008), while the evidence on the other European countries is in line with Borgonovi (2008).

Regarding the second hypothesis, coefficients on informal volunteering are not statistically significant in Denmark, Greece and Sweden while negative and statistically significant in Finland, the Netherlands, and Spain (at conventional level or more) and in Austria, France and Italy (at 10 percent level). This last evidence indicates that in FI, AT, FR, NL, ES and IT informal volunteering decreases the likelihood of declaring good/very good perceived health.

As our informal volunteering variable also included informal caregiving[4] provided by friends and neighbour, our results are strictly related to the literature on the relationship between informal care and health, according to which informal caregivers are more likely to report poor perceived health and to present depressive symptoms mainly because providing informal care can be stressful and time-consuming (Dujardin et al. 2011; Brown and Brown 2014).

As regards the control variables, in almost all European countries the probability of declaring a good/very good perceived health increases with education, household income, recreational and cultural participation, meetings with friends, home warm and decreases with age, unmet need for medical examination, the status of employed part time, unemployed, retired, disabled, domestic tasks, inactive and home dark problem. These results are in line with the huge evidence on self-perceived health (see Fiorillo and Sabatini 2011, 2015).

[4] An informal caregiver i san unpaid individual (family member, friend or neighbor) involved in assisting others who are unable to perform certain activities on their own (Brown and Brown 2014).

Tables from 1 to 3, in Appendix C, report the estimates of the determinants of formal volunteering and informal volunteering as well as the test of joint significance of the correlation coefficients between unobservable of the volunteering equations (in the bottom lines). This last evidence shows that formal and informal volunteering are highly correlated meaning that the choices to supply formal volunteering and informal volunteering are taken jointly, confirming previous investigation (Hank and Stuck 2008). However, the determinants of formal and informal volunteering show different statistical significance across the 9 European countries analysed. Findings on the Netherlands are relevant and help us to provide a reasonable explanation of results provided in Tables 2-5. Indeed, in the Netherlands individuals who supply formal volunteering and informal volunteering share many personal characteristics: volunteers are female, married, young, educated, employed part-time, student, retired, inactive and with a wide social and cultural life. Nevertheless, the effect on perceived health of being formal or informal volunteers is different. Hence, it could be said that volunteers, by formally volunteering, gain a sense of meaning, purpose of life and self-esteem that increase their perceived health. On the contrary, informal volunteers, helping within a closer social network likely characterized by stronger social responsibilities and less social recognition, experience fatigue and burnout that decrease their perceived health. The same could be said also as regards results on Finland, Austria, France, Spain and Italy.

6. Conclusions

In this paper, we study the effect of formal and informal volunteering on self-perceived health across 9 European countries. So far, the largest part of the literature has looked at formal volunteering as indicator of time donation and has focused on a single country, ignoring informal volunteering and cross-country comparisons. Moreover, only recently it has been paid attention to the issue of reverse causation. The contribution of this paper is threefold. First, it studies simultaneously the effect of formal and informal volunteering on self-perceived health, controlling, amongst other things, for human capital, social and cultural participation and comparing 9 European countries characterized by different Welfare State regimes. Second, it analyses the determinants of formal and informal volunteering showing that formal and informal charitable contributions of time are complementary and that national differences are explained by differences in human, social and cultural factors. Third, the paper uses recursive trivariate probit models with participation variables as instruments for formal and informal volunteering to account for reverse causality.

Our results show that formal volunteering is a positive predictor of self-perceived heath only for the Netherlands. For the other European countries, we do not find statistically significant differences as regards self-perceived health between individuals who supply formal voluntary work and individuals who do not. On the other hand, informal volunteering is found to be a negative predictor of self-perceived health in 5 European countries: Austria, Finland, France, the Netherlands, Spain, and Italy. These results seem to fit with the mechanisms discussed in Section 2 in explaining the link between volunteering and health. Formal volunteering is beneficial for individual self-perceived health, through the physical and psychological well-being related to the social relations and altruism motivations of supplying formal unpaid work. However, when "volunteering becomes a burden, this may lead to 'burnout'" (Jenkinson et al. 2013). This seems to be the case of informal volunteering. People who informally volunteer are likely to perceive such activity as a duty towards the collectivity, since there are few possibilities to see users' needs satisfied in other ways, so, volunteering can become stressing with a consequent negative impact on health

Several limitations of the current study can be declared. The first limitation concerns the absence of other measures of volunteering, such as volunteering hours that is not available in the employed dataset. This prevents us to check the robustness of our estimates using alternative indicators. The second limitation is that the dataset collection on social and cultural variables in EU-SILC is cross-sectional while the optimal dataset should be a panel data. The third limitation is that instrumental variables are observed in the same year of declaring self-perceived health while the optimal timing would be at least one year before. Another limitation is that health is declared by respondents and might be influenced by individual characteristics such as socioeconomic status not observed.

Definitely, further research in this field is needed and better data are required for more reliable results, in particular in pointing the existence of a negative influence of informal volunteering on self-perceived health. The current paper contributes to the view that informal volunteering play an important role in shaping individual health conditions, a role perhaps overlooked by health policy so far.

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Appendix A.

Table A1.Variable definitions

Variable	*Description*
Dependent variable	
Self-perceived good health	Individual assessment of health. Dummy, 1=good and very good; 0 otherwise
Key independent variables	
Formal Volunteering	Dummy, 1 if the respondent, during the last twelve months, participated in the unpaid work of charitable organisations, groups or clubs. It includes unpaid charitable work for churches, religious groups and humanitarian organisations. Attending meetings connected with these activities is included; 0 otherwise
Informal Volunteering	Dummy, 1 if the respondent, during the last twelve months, undertook (private) voluntary activities to help someone, such as cooking for others; taking care of people in hospitals/at home; taking people for a walk. It excludes any activity that a respondent undertakes for his/her household, in his/her work or within voluntary organisations; 0 otherwise
Demographic and socio-economic characteristics	
Female	Dummy, 1 if female; 0 otherwise**. Reference group: male**
Married	Dummy, 1 if married; 0 otherwise; **Reference group: single status**
Separated/divorced	Dummy, 1 if separated/divorced; 0 otherwise
Widowed	Dummy, 1 if widowed; 0 otherwise
Age 31- 50	Age of the respondent. Dummy, 1 if age between 31 and 50. **Reference group: age 16 - 30**
Age 51- 64	Age of the respondent. Dummy, 1 if age between 51 and 64
Age > 65	Age of the respondent. Dummy, 1 if age above 65
Lower secondary edu	Dummy, 1 if the respondent has attained lower secondary education; 0 otherwise. **Reference group: no education/primary education**
Secondary edu	Dummy, 1 if the respondent has attained secondary education; 0 otherwise
Tertiary edu	Dummy, 1 if the respondent has attained tertiary education; 0 otherwise
Household size	Number of household members
EU birth	Dummy, 1 if the respondent was born in a European Union country; 0 otherwise. **Reference group: country of residence**
OTH birth	Dummy, 1 if the respondent was born in any other country; 0 otherwise
Household income (ln)	Natural log of total disposal household income (HY020)
Unmet need for medical examination	Dummy 1, if there was at least one occasion when the person really needed examination or treatment but did not; 0 otherwise
Homeowner	Dummy, 1 if the respondent owns the house where he/she lives; 0 otherwise
Employed part time	Self-defined current economic status of the respondents; 1 = employed part time; **Reference group: employed full time**
Unemployed	Self-defined current economic status of the respondents; 1 = unemployed; 0 otherwise
Student	Self-defined current economic status of the respondents; 1 = student; 0 otherwise
Retired	Self-defined current economic status of the respondents; 1 = retired; 0 otherwise
Disabled	Self-defined current economic status of the respondents; 1 = permanently disabled; 0 otherwise
Domestic tasks	Self-defined current economic status of the respondents; 1 = domestic tasks; 0 otherwise
Inactive	Self-defined current economic status of the respondents; 1 = other inactive person; 0 otherwise
Housing feature	
Home warm	Dummy, 1 if the respondent is able to pay to keep the home adequately warm; 0 otherwise
Home dark problem	Dummy, 1 if the respondent feels the dwelling is too dark, not enough light; 0 otherwise

Variable	*Description*
Neighbourhood quality	
Noise	Dummy, 1 if the respondent feels noise from neighbours is a problem for the household; 0 otherwise
Pollution	Dummy, 1 if the respondent feels pollution, grime or other environmental problems are a problem for the household; 0 otherwise
Crime	Dummy, 1 if the respondent feels crime, violence or vandalism is a problem for the household; 0 otherwise
Size of municipality	
Densely populated area	Dummy, 1 if the respondent lives in local areas where the total population for the set is at least 50,000 inhabitants. **Reference Group: Thinly-populated area**
Intermediate area	Dummy, 1 if the respondent lives in local areas, not belonging to a densely-populated area, and either with a total population for the set of at least 50,000 inhabitants or adjacent to a densely-populated area.
Other social and cultural participation variables	
Political parties or trade unions	Dummy, 1 if the respondent, during the last twelve months, participated in activities related to political groups, political association, political parties or trade unions. Attending meetings connected with these activities is included; 0 otherwise
Professional participation	Dummy, 1 if the respondent, during the last twelve months, participated in activities related to a professional association. Attending meetings connected with these activities is included; 0 otherwise
Religious participation	Dummy, 1 If the respondent, during the last twelve months, participated in activities related to churches, religious communions or associations. Attending holy mass or similar religious acts or helping during these services is also included; 0 otherwise
Recreational participation	Dummy, 1 if the respondent, during the last twelve months, participated in recreational/leisure activities arranged by a club, association or similar. Attending meetings connected with these activities is included; 0 otherwise
Participation in other organisations	Dummy, 1 if the respondent, during the last twelve months, participated in the activities of environmental organisations, civil rights groups, neighbourhood associations, peace groups etc. Attending meetings connected with these activities is included; 0 otherwise
Meetings with friends	Dummy 1, if the respondent gets together with friends every day or several times a week during a usual year; 0 otherwise
Cinema	Dummy. 1 if the respondent goes to the cinema 1-3 times a year; 0 otherwise
Live performance	Dummy. 1 if the respondent goes to any live performance (plays, concerts, operas, ballet and dance performances) 1-3 times a year; 0 otherwise
Cultural site	Dummy. 1 if the respondent visits historical monuments, museum, art galleries or archaeological sites 1-3 times a year; 0 otherwise
Sport events	Dummy. 1 if the respondent attends live sport events 1-3 times a year; 0 otherwise

Appendix B.

Table B.1. Descriptive statistics (mean) of Nordic countries

	FI			DK			SE		
	All	ForVol	InfVol	All	ForVol	InfVol	All	ForVol	InfVol
SPH	0.65			0.73			0.74		
ForVol	0.12			0.12			0.12		
InfVol	0.38			0.03			0.36		
Female	0.54	0.64	0.55	0.52	0.59	0.59	0.52	0.55	0.51
Married	0.39	0.46	0.42	0.39	0.37	0.37	0.33	0.40	0.37
Separated/divorced	0.10	0.10	0.07	0.12	0.13	0.12	0.13	0.13	0.09
Widowed	0.14	0.14	0.16	0.12	0.12	0.13	0.15	0.17	0.15
Age 31- 50	0.32	0.32	0.34	0.34	0.31	0.48	0.32	0.30	0.35
Age 51- 64	0.24	0.27	0.30	0.23	0.24	0.23	0.22	0.25	0.27
Age > 65	0.25	0.23	0.19	0.23	0.26	0.15	0.25	0.27	0.19
Lower secondary edu	0.33	0.23	0.30	0.35	0.32	0.33	0.11	0.08	0.10
Secondary edu	0.40	0.39	0.41	0.42	0.39	0.36	0.50	0.47	0.52
Tertiary edu	0.27	0.38	0.29	0.23	0.29	0.30	0.28	0.40	0.30
Household size	2.12	2.19	2.13	2.02	1.88	2.09	2.10	2.09	2.18
EU birth	0.01	0.01	0.01	0.01	0.01	0.00	0.05	0.04	0.04
OTH birth	0.02	0.01	0.01	0.04	0.03	0.00	0.06	0.06	0.05
Household income (ln)	10.07	10.22	10.10	10.25	10.14	10.26	10.01	10.09	10.12
Uneed meet f.m.e.	0.03	0.03	0.04	0.01	0.01	0.01	0.15	0.14	0.16
Homeowner	0.67	0.73	0.67	0.58	0.54	0.55	0.61	0.62	0.65
Employed part time	0.06	0.08	0.07	0.07	0.07	0.07	0.12	0.11	0.14
Unemployed	0.06	0.05	0.08	0.03	0.04	0.03	0.03	0.02	0.03
Student	0.06	0.05	0.05	0.10	0.13	0.13	0.08	0.08	0.07
Retired	0.26	0.24	0.21	0.26	0.26	0.16	0.26	0.28	0.20
Disabled	0.06	0.07	0.07	0.06	0.06	0.11	0.05	0.05	0.04
Domestic tasks	0.02	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.01
Inactive	0.01	0.01	0.01	0.02	0.02	0.00	0.01	0.00	0.01
Home warm	0.97	0.98	0.97	0.90	0.88	0.88	0.97	0.97	0.97
Home dark problem	0.04	0.04	0.05	0.08	0.13	0.08	0.06	0.08	0.07
Noise	0.18	0.17	0.17	0.20	0.22	0.23	0.14	0.13	0.12
Pollution	0.13	0.16	0.14	0.08	0.09	0.14	0.07	0.10	0.08
Crime	0.17	0.20	0.18	0.14	0.13	0.22	0.14	0.13	0.15
Densely populated area	0.29	0.32	0.26	0.36	0.38	0.33	0.21	0.20	0.20
Intermediate area	0.17	0.16	0.18	0.29	0.28	0.28	0.14	0.12	0.13
Political parties/t.u.	0.10	0.21	0.14	0.12	0.25	0.20	0.09	0.19	0.12
Professional part.	0.08	0.16	0.10	0.11	0.19	0.22	0.10	0.22	0.13
Religious part.	0.16	0.32	0.19	0.11	0.31	0.28	0.19	0.41	0.25
Recreational part.	0.37	0.61	0.43	0.30	0.58	0.65	0.37	0.59	0.47
Other org. part.	0.17	0.32	0.21	0.08	0.18	0.19	0.24	0.40	0.29
Meetings with friends	0.68	0.75	0.72	0.59	0.67	0.72	0.63	0.69	0.67
Cinema	0.29	0.32	0.31	0.29	0.30	0.26	0.34	0.40	0.39
Live performance	0.33	0.35	0.34	0.35	0.39	0.37	0.39	0.42	0.45
Cultural site	0.28	0.31	0.31	0.32	0.37	0.37	0.33	0.33	0.36
Sport events	0.20	0.25	0.23	0.14	0.17	0.19	0.16	0.19	0.18
Obs	10757	1467	4366	5691	671	177	6781	778	2547

Table B.2. Descriptive statistics (mean) of Continental countries

	AT			FR			NL		
	All InfVol	ForVol	InfVol	All	ForVol	InfVol	All	ForVol	
SPH	0.72			0.69			0.74		
ForVol	0.06			0.01			0.32		
InfVol	0.31			0.17			0.53		
Female	0.52	0.44	0.52	0.52	0.59	0.53	0.53	0.58	0.54
Married	0.54	0.55	0.57	0.52	0.58	0.58	0.46	0.55	0.50
Separated/divorced	0.10	0.08	0.06	0.07	0.07	0.05	0.10	0.08	0.06
Widowed	0.07	0.06	0.07	0.07	0.10	0.07	0.10	0.09	0.10
Age 31- 50	0.37	0.42	0.42	0.34	0.30	0.36	0.38	0.37	0.40
Age 51- 64	0.20	0.24	0.24	0.21	0.30	0.25	0.23	0.26	0.25
Age > 65	0.20	0.15	0.15	0.21	0.27	0.21	0.21	0.21	0.15
Lower secondary edu	0.26	0.15	0.20	0.16	0.09	0.14	0.23	0.23	0.22
Secondary edu	0.56	0.63	0.60	0.39	0.33	0.42	0.38	0.38	0.40
Tertiary edu	0.16	0.21	0.18	0.20	0.42	0.24	0.27	0.30	0.30
Household size	2.91	2.98	2.93	2.69	2.37	2.69	2.27	2.42	2.38
EU birth	0.05	0.04	0.04	0.04	0.02	0.03	0.01	0.01	0.01
OTH birth	0.11	0.03	0.08	0.08	0.10	0.07	0.05	0.04	0.04
Household income (ln)	10.35	10.48	10.41	10.21	10.28	10.26	10.14	10.18	10.18
Uneed meet f.m.e.	0.02	0.02	0.02	0.04	0.07	0.05	0.02	0.02	0.02
Homeowner	0.59	0.70	0.65	0.63	0.71	0.69	0.55	0.60	0.59
Employed part time	0.09	0.11	0.11	0.08	0.07	0.10	0.22	0.24	0.25
Unemployed	0.04	0.02	0.04	0.06	0.05	0.06	0.02	0.02	0.02
Student	0.05	0.05	0.05	0.08	0.07	0.08	0.06	0.06	0.07
Retired	0.26	0.24	0.23	0.26	0.37	0.29	0.15	0.16	0.13
Disabled	0.00	0.00	0.00	0.03	0.03	0.03	0.05	0.05	0.04
Domestic tasks	0.09	0.06	0.10	0.04	0.05	0.04	0.12	0.12	0.10
Inactive	0.01	0.02	0.01	0.01	0.01	0.01	0.04	0.08	0.05
Home warm	0.96	0.98	0.97	0.94	0.96	0.93	0.97	0.98	0.98
Home dark problem	0.10	0.09	0.12	0.12	0.07	0.11	0.16	0.17	0.17
Noise	0.19	0.20	0.20	0.20	0.13	0.18	0.32	0.31	0.34
Pollution	0.08	0.07	0.08	0.16	0.19	0.16	0.14	0.15	0.16
Crime	0.12	0.12	0.12	0.16	0.14	0.16	0.17	0.17	0.18
Densely populated area	0.36	0.25	0.29	0.47	0.61	0.39			
Intermediate area	0.24	0.27	0.28	0.35	0.25	0.39			
Political parties/t.u.	0.05	0.19	0.08	0.03	0.14	0.04	0.04	0.07	0.05
Professional part.	0.04	0.09	0.07	0.01	0.05	0.02	0.11	0.13	0.14
Religious part.	0.14	0.32	0.19	0.01	0.14	0.04	0.43	0.63	0.46
Recreational part.	0.23	0.41	0.33	0.23	0.38	0.40	0.46	0.55	0.50
Other org. part.	0.02	0.09	0.05	0.11	0.40	0.19	0.21	0.34	0.26
Meetings with friends	0.60	0.68	0.61	0.48	0.51	0.54	0.58	0.59	0.60
Cinema	0.18	0.22	0.22	0.23	0.21	0.26	0.25	0.27	0.29
Live performance	0.17	0.18	0.20	0.32	0.35	0.37	0.32	0.36	0.35
Cultural site	0.18	0.23	0.27	0.27	0.35	0.33	0.28	0.32	0.30
Sport events	0.12	0.16	0.16	0.14	0.12	0.18	0.13	0.14	0.15
Obs	12193	813	3813	19865	290	3549	8985	3093	5057

Table B.3. Descriptive statistics (mean) of Mediterranean countries

	ES			GR			IT		
	All InfVol	ForVol	InfVol	All	ForVol	InfVol	All	ForVol	
SPH	0.68			0.77			0.57		
ForVol	0.11			0.03			0.07		
InfVol	0.45			0.19			0.25		
Female	0.51	0.57	0.55	0.51	0.63	0.56	0.52	0.51	0.60
Married	0.59	0.66	0.64	0.62	0.67	0.68	0.58	0.56	0.65
Separated/divorced	0.10	0.09	0.08	0.09	0.09	0.08	0.12	0.09	0.11
Widowed	0.01	0.01	0.01	0.02	0.03	0.02	0.02	0.02	0.02
Age 31- 50	0.38	0.41	0.42	0.35	0.35	0.40	0.36	0.37	0.39
Age 51- 64	0.19	0.23	0.21	0.20	0.25	0.20	0.20	0.25	0.26
Age > 65	0.20	0.23	0.16	0.22	0.23	0.21	0.24	0.18	0.21
Lower secondary edu	0.23	0.17	0.23	0.13	0.09	0.12	0.30	0.25	0.28
Secondary edu	0.22	0.23	0.22	0.35	0.35	0.36	0.33	0.40	0.36
Tertiary edu	0.24	0.36	0.25	0.16	0.35	0.19	0.10	0.19	0.13
Household size	3.22	3.02	3.17	3.10	2.89	3.02	2.96	2.89	2.87
EU birth	0.01	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.01
OTH birth	0.04	0.03	0.04	0.06	0.04	0.05	0.05	0.03	0.04
Household income (ln)	9.94	10.04	9.97	9.81	10.05	9.89	10.16	10.32	10.22
Uneed meet f.m.e.	0.06	0.07	0.07	0.07	0.08	0.06	0.07	0.07	0.09
Homeowner	0.84	0.87	0.85	0.76	0.82	0.78	0.74	0.81	0.78
Employed part time	0.05	0.05	0.06	0.05	0.07	0.05	0.05	0.06	0.06
Unemployed	0.07	0.05	0.07	0.06	0.04	0.04	0.05	0.05	0.04
Student	0.07	0.06	0.06	0.08	0.04	0.06	0.06	0.08	0.05
Retired	0.15	0.17	0.13	0.21	0.21	0.20	0.22	0.22	0.23
Disabled	0.02	0.02	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Domestic tasks	0.13	0.15	0.15	0.15	0.20	0.18	0.14	0.11	0.16
Inactive	0.05	0.05	0.04	0.01	0.01	0.01	0.05	0.04	0.04
Home warm	0.91	0.93	0.91	0.87	0.94	0.91	0.90	0.94	0.92
Home dark problem	0.17	0.14	0.17	0.21	0.15	0.19	0.22	0.22	0.24
Noise	0.27	0.31	0.28	0.20	0.22	0.18	0.25	0.27	0.27
Pollution	0.17	0.20	0.18	0.17	0.19	0.16	0.22	0.23	0.24
Crime	0.20	0.22	0.21	0.08	0.10	0.08	0.15	0.16	0.15
Densely populated area	0.52	0.59	0.50	0.39	0.41	0.42	0.44	0.43	0.42
Intermediate area	0.20	0.18	0.21	0.14	0.17	0.15	0.39	0.40	0.38
Political parties/t.u.	0.04	0.08	0.04	0.05	0.15	0.08	0.04	0.12	0.06
Professional part.	0.04	0.11	0.06	0.06	0.20	0.10	0.05	0.14	0.06
Religious part.	0.17	0.40	0.20	0.29	0.51	0.35	0.19	0.48	0.27
Recreational part.	0.14	0.26	0.16	0.08	0.36	0.11	0.10	0.40	0.17
Other org. part.	0.07	0.19	0.10	0.06	0.24	0.09	0.05	0.19	0.08
Meetings with friends	0.66	0.67	0.69	0.79	0.79	0.81	0.66	0.78	0.68
Cinema	0.21	0.23	0.23	0.22	0.28	0.24	0.22	0.26	0.22
Live performance	0.22	0.28	0.26	0.24	0.33	0.29	0.19	0.32	0.24
Cultural site	0.25	0.29	0.29	0.12	0.27	0.18	0.17	0.32	0.23
Sport events	0.12	0.14	0.14	0.14	0.15	0.14	0.12	0.17	0.13
Obs	29257	3279	12743	12868	406	2282	45975	3563	12041

Appendix C.

Table C.1. Trivariate probit estimations: volunteering in Nordic countries

	DK		FI		SE	
	ForVol	InfVol	ForVol	InfVol	ForVol	InfVol
Female	0.091*(0.049)	0.128* (0.077)	0.195***(0.037)	0.127***(0.028)	0.028 (0.047)	0.009 (0.035)
Married	-0.013 (0.077)	0.055 (0.103)	0.244***(0.056)	0.105**(0.042)	0.307***(0.068)	0.088* (0.049)
Separated/divorced	-0.152 (0.126)	0.322* (0.185)	0.199** (0.094)	-0.199***(0.074)	0.194*(0.117)	-0.011 (0.088)
Widowed	-0.077 (0.107)	0.078 (0.155)	0.163** (0.071)	0.136***(0.052)	0.245***(0.086)	0.056 (0.064)
Age 31- 50	-0.032 (0.097)	0.168 (0.146)	-0.065 (0.065)	0.192***(0.049)	-0.031 (0.080)	0.007 (0.057)
Age 51- 64	0.224** (0.112)	0.129 (0.162)	0.064 (0.075)	0.361***(0.057)	0.058 (0.095)	0.159** (0.070)
Age > 65	0.538***(0.158)	-0.013 (0.242)	0.219* (0.121)	0.042 (0.092)	0.139 (0.162)	-0.011 (0.122)
Lower secondary edu					0.356***(0.123)	0.040 (0.082)
Secondary edu	0.010 (0.060)	0.162* (0.090)	0.172***(0.048)	0.015 (0.036)	0.441***(0.101)	0.112* (0.067)
Tertiary edu	0.047 (0.067)	0.192* (0.102)	0.298***(0.053)	-0.056 (0.041)	0.554***(0.107)	0.034 (0.072)
Household size	0.007 (0.028)	0.021 (0.039)	-0.042** 0.018)	-0.006 (0.014)	-0.268 (0.025)	-0.068** (0.018)
EU birth	0.109 (0.201)	-0.132 (0.326)	0.068(0.198)	-0.238(0.163)	0.151 (0.102)	-0.124 (0.081)
OTH birth	-0.030 (0.150)	-0.303 (0.287)	-0.031 (0.225)	-0.272(0.185)	0.151 (0.097)	-0.072 (0.074)
Household income (ln)	-0.117**(0.057)	0.066 (0.088)	0.148***(0.037)	-0.0189(0.026)	-0.024 (0.040)	0.041 (0.034)
Homeowner	-0.025 (0.063)	-0.120 (0.093)	-0.045 (0.050)	-0.070* (0.038)	-0.112** (0.055)	0.088** (0.042)
Employed part time	0.003 (0.085)	-0.083 (0.122)	0.079 (0.067)	0.118** (0.053)	-0.069 (0.071)	0.001 (0.051)
Unemployed	-0.051 (0.162)	-0.197 (0.247)	0.102 (0.081)	0.216***(0.061)	-0.122 (0.146)	0.030 (0.096)
Student	0.203* (0.110)	0.261 (0.170)	0.140* (0.085)	-0.060 (0.065)	0.127 (0.100)	-0.122*(0.074)
Retired	-0.289**(0.119)	-0.102 (0.187)	-0.215**(0.100)	0.023(0.076)	0.065 (0.141)	-0.087 (0.104)
Disabled	0.073 (0.122)	0.182 (0.171)	0.055 (0.086)	-0.027(0.066)	0.140 (0.112)	-0.063 (0.086)
Domestic tasks	-0.469 (0.483)	0.204 (0.468)	-0.000 (0.104)	-0.111(0.084)	0.294 (0.304)	0.086 (0.247)
Inactive	-0.007 (0.200)	-0.445 (0.372)	0.303* (0.171)	0.367***(0.137)	-0.293 (0.304)	-0.045 (0.191)
Noise	0.044 (0.066)	-0.046 (0.098)	-0.041 (0.055)	-0.037 (0.042)	-0.042 (0.072)	-0.059 (0.055)
Pollution	0.002 (0.096)	0.110 (0.132)	0.133** (0.055)	0.026 (0.045)	0.228***(0.083)	0.134** (0.066)
Crime	-0.006 (0.074)	0.062 (0.105)	0.119** (0.052)	0.068 (0.042)	0.026 (0.069)	0.128** (0.052)
Densely populated area	0.028 (0.059)	-0.227**(0.093)	0.054 (0.052)	-0.148***(0.041)	-0.132** (0.060)	-0.120***(0.044)
Intermediate area	0.067 (0.057)	-0.164* (0.088)	-0.020 (0.052)	-0.032 (0.041)	-0.146** (0.067)	-0.183***(0.049)
Political parties/t.u.	0.247***(0.064)	0.134 (0.097)	0.273***(0.050)	0.101***(0.044)	0.240***(0.069)	0.206***(0.057)
Professional part.	0.258***(0.066)	0.107 (0.100)	0.141***(0.055)	0.128***(0.047)	0.346***(0.065)	0.040 (0.056)
Religious part.	0.550***(0.064)	0.313***(0.096)	0.432***(0.043)	0.242***(0.037)	0.543***(0.051)	0.302***(0.043)
Recreational part.	0.624***(0.049)	0.588***(0.076)	0.414***(0.036)	0.168***(0.029)	0.393***(0.046)	0.286***(0.035)
Other org. part.	0.318***(0.078)	0.161 (0.110)	0.291***(0.041)	0.172***(0.035)	0.296***(0.049)	0.144***(0.039)
Meetings with friends	0.113** (0.050)	0.210*** 0.077)	0.186***(0.039)	0.176***(0.030)	0.069 (0.049)	0.093** (0.036)
Cinema	0.011 (0.052)	-0.060 (0.076)	0.005 (0.038)	0.006(0.030)	0.039 (0.047)	0.051 (0.035)
Live performance	0.072 (0.049)	-0.080 (0.074)	0.026 (0.037)	0.036 (0.029)	0.007 (0.047)	0.061 (0.035)
Cultural site	0.080 (0.049)	0.070 (0.074)	0.055 (0.038)	0.069**(0.029)	-0.026 (0.048)	0.052 (0.035)
Sport events	0.036 (0.064)	0.082 (0.091)	0.119***(0.041)	0.095***(0.033)	0.067 (0.057)	0.033 (0.044)
Regional dummies			Yes	Yes	Yes	
$\rho_{FVIV} = Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.428*** (0.042)		0.116*** (0.021)		0.231*** (0.026)	

Note: The symbols ***, **, * denote that the coefficient is statistically different from zero at 1, 5 and 10 percent.

Table C.2. Trivariate probit estimations: volunteering in Continental countries

	AT		FR		NL	
	ForVol	InfVol	ForVol	InfVol	ForVol	InfVol
Female	-0.098**(0.043)	0.069** (0.029)	0.164*** (0.055)	0.054** (0.025)	0.113***(0.037)	.0.098***(0.035)
Married	-0.192***(0.061)	-0.037 (0.041)	0.109 (0.083)	0.057 (0.035)	0.140***(0.047)	0.232***(0.044)
Separated/divorced	-0.039(0.095)	-0.248***(0.063)	-0.029 (0.129)	-0.087 (0.061)	-0.107 (0.074)	0.011 (0.069)
Widowed	-0.253***(0.094)	0.021 (0.061)	0212* (0.109)	0.097* (0.052)	0.056 (0.065)	0.236***(0.060)
Age 31- 50	0.171** (0.071)	0.061 (0.046)	0.158 (0.115)	0.199***(0.044)	0.016(0.058)	0.111** (0.054)
Age 51- 64	0.178** (0.086)	0.073 (0.056)	0.200 (0.129)	0.268***(0.053)	0.126* (0.069)	0.157** (0.065)
Age > 65	0.038 (0.112)	-0.233 (0.071)	0.191 (0.158)	0.151** (0.070)	-0.003 (0.088)	-0.275***(0.084)
Lower secondary edu			0.023 (0.109)	0.172***(0.043)	0.165***(0.062)	0.229***(0.057)
Secondary edu	0.177***(0.055)	0.110***(0.033)	0.155* (0.091)	0.215***(0.037)	0.253***(0.062)	0.289***(0.056)
Tertiary edu	0.146** (0.071)	0.114***(0.044)	0.427***(0.099)	0.275***(0.043)	0.351***(0.065)	0.280***(0.060)
Household size	-0.009 (0.017)	-0.036***(0.012)	-0.116***(0.030)	0.003 (0.011)	0.067***(0.017)	0.009 (0.016)
EU birth	-0.029 (0.100)	-0.047 (0.066)	-0.197 (0.169)	-0.033 (0.065)	-0.249* (0.140)	-0.348***(0.126)
OTH birth	-0.301*** (0.099)	-0.069 (0.052)	-0.045 (0.107)	-0.01 (0.046)	-0.090 (0.081)	-0.153**(0.075)
Household income (ln)	0.063 (0.040)	0.025 (.027)	0.032 (0.059)	-0.006 (0.025)	-0.027 (0.036)	0.030 (0.034)
Homeowner	-0.009 (0.017)	0.063** (0.030)	0.070 (0.067)	0.006 (0.028)	-0.031 (0.037)	-0.003 (0.035)
Employed part time	0.095 (0.069)	0.144***(0.046)	-0.001 (0.098)	0.121***(0.042)	0.210***(0.045)	0.093** (0.042)
Unemployed	-0.095 (0.131)	0.058 (0.077)	0.100 (0.125)	0.178***(0.051)	0.413***(0.131)	0.150 (0.127)
Student	-0.018 (0.099)	-0.007 (0.063)	0.182 (0.156)	0.166***(0.056)	0.148* (0.089)	0.265***(0.081)
Retired	0.027 (0.075)	0.092* (0.50)	0.065 (0.094)	0.177***(0.048)	0.346***(0.068)	0.191***(0.065)
Disabled	-3.484***(0.085)	-0.361 (0.278)	0.255 (0.140)	0.106 (0.066)	0.315***(0.087)	-0.217***(0.082)
Domestic tasks	-0.005 (0.082)	0.153***(0.050)	0.256** (0.126)	0.242***(0.059)	0.302***(0.064)	0.044 (0.061)
Inactive	0.446***(0.164)	0.133 (0.126)	0.051 (0.252)	0.088 (0.104)	0.992***(0.086)	0.469***(0.087)
Noise	0.128** (0.053)	0.056 (0.036)	-0.212***(0.081)	0.002 (0.032)	-0.032 (0.034)	0.089***(0.031)
Pollution	-0.062 (0.084)	0.153***(0.053)	0.113 (0.076)	0.085** (0.034)	0.004 (0.044)	0.130***(0.042)
Crime	-0.028 (0.064)	0.031 (0.043)	-0.040 (0.075)	0.061* (0.033)	0.033 (0.042)	0.110***(0.040)
Densely populated area	-0.280***(0.054)	-0.206***(0.035)	0.094 (0.089)	-0.196***(0.036)		
Intermediate area	-0.066 (0.047)	0.020 (0.032)	0.021 (0.082)	-0.059* (0.032)		
Political parties/t.u.	0.497***(0.065)	0.272***(0.054)	0.491***(0.091)	0.032 (0.065)	0.388***(0.068)	-0.008 (0.068)
Professional part.	0.171** (0.081)	0.404***(0.064)	0.470***(0.147)	0.224** (0.101)	0.127***(0.044)	0.212***(0.043)
Religious part.	0.480***(0.046)	0.269***(0.036)	0.855***(0.104)	0.838***(0.081)	0.682***(0.030)	0.145***(0.028)
Recreational part.	0.238***(0.042)	0.319***(0.030)	0.166***(0.056)	0.497***(0.025)	0.202***(0.031)	0.041 (0.029)
Other org. part.	0.722***(0.086)	0.659***(0.078)	0.508***(0.057)	0.374***(0.033)	0.453***(0.036)	0.270***(0.036)
Meetings with friends	0.126***(0.041)	-0.051* (0.027)	0.056 (0.053)	0.174***(0.024)	0.081***(0.031)	0.171***(0.029)
Cinema	0.075 (0.048)	0.054 (0.033)	-0.045 (0.064)	0.077***(0.026)	-0.137 (0.034)	0.075** (0.032)
Live performance	0.022 (0.049)	0.084***(0.032)	-0.000 (0.056)	0.051** 80.024)	0.056* (0.032)	0.069** (0.030)
Cultural site	0.030 (0.046)	0.306***(0.032)	0.094* (0.057)	0.104***(0.025)	0.087***(0.032)	0.077** (0.031)
Sport events	0.078 (0.055)	0.172***((0.038)	0.005 (0.073)	0.080***(0.031)	0.023 (0.042)	0.064 (0.040)
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
$\rho_{FVIV} = Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.317*** (0.022)		0.174*** (0.031)		0.176*** (0.018)	

Note: The symbols ***, **, * denote that the coefficient is statistically different from zero at 1, 5 and 10 percent.

Table C.3. Trivariate probit estimations: volunteering in Mediterranean countries

	ES		GR		IT	
	ForVol	InfVol	ForVol	InfVol	ForVol	InfVol
Female	0.162***(0.026)	0.223***(0.019)	0.309***(0.061)	0.154***(0.032)	0.058***(0.022)	0.298***(0.015)
Married	0.135***(0.034)	0.177***(0.025)	0.229***(0.091)	0.229***(0.049)	-0.037 (0.030)	0.276***(0.021)
Separated/divorced	0.017 (0.051)	-0.037 (0.038)	0.195 (0.122)	0.073 (0.071)	-0.079* (0.045)	0.103***(0.030)
Widowed	0.064 (0.093)	0.043 (0.069)	0.376** (0.158)	0.211** (0.107)	0.010 (0.073)	0.127** (0.053)
Age 31- 50	0.306***(0.044)	0.090***(0.029)	0.069 (0.102)	0.065 (0.053)	0.082** (0.037)	0.085***(0.026)
Age 51- 64	0.453***(0.051)	0.172***(0.035)	0.258** (0.117)	-0.002 (0.064)	0.210***(0.044)	0.169***(0.031)
Age > 65	0.483***(0.065)	-0.190***(0.047)	0.293** (0.136)	-0.044 (0.078)	0.037 (0.056)	-0.085** (0.037)
Lower secondary edu	0.170***(0.035)	-0.006 (0.024)	0.329***(0.093)	0.074 (0.050)	0.239***(0.034)	0.132***(0.021)
Secondary edu	0.352***(0.037)	0.068***(0.026)	0.409***(0.076)	0.088**(0.041)	0.335***(0.034)	0.188***(0.022)
Tertiary edu	0.459***(0.037)	0.089***(0.027)	0.617***(0.088)	0.132***(0.051)	0.389***(0.042)	0.220***(0.029)
Household size	-0.065***(0.010)	-0.043***(0.007)	-0.081***(0.026)	-0.077***(0.013)	-0.036***(0.010)	-0.055***(0.007)
EU birth	-0.082 (0.112)	-0.087 (0.084)	0.369** (0.178)	-0.021 (0.130)	-0.074 (0.092)	-0.174***(0.063)
OTH birth	-0.144** (0.063)	-0.066 (0.042)	0.001 (0.128)	-0.055 (0.066)	-0.181***(0.063)	-0.088** (0.037)
Household income (ln)	0.063***(0.020)	-0.013 (0.012)	0.099** (0.047)	0.077***(0.025)	0.063***(0.019)	0.003 (0.012)
Homeowner	0.108***(0.034)	0.005 (0.023)	0.187***(0.072)	0.137***(0.038)	0.088***(0.026)	0.089***(0.017)
Employed part time	0.066 (0.050)	0.023 (0.037)	0.419***(0.109)	0.079 (0.066)	0.063 (0.044)	0.065** (0.031)
Unemployed	-0.022 (0.050)	-0.004 (0.034)	0.165 (0.128)	-0.100 (0.071)	0.103** (0.049)	0.060* (0.034)
Student	0.165***(0.057)	-0.167***(0.037)	-0.097 (0.154)	0.008 (0.072)	0.078* (0.047)	-0.010 (0.035)
Retired	0.020 (0.048)	0.021 (0.037)	0.158* (0.091)	0.027 (0.054)	0.178***(0.037)	0.151***(0.025)
Disabled	0.008 (0.087)	-0.210***(0.062)	0.379* (0.230)	-0.242 (0.149)	-0.064 (0.110)	-0.444***(0.078)
Domestic tasks	0.029 (0.042)	0.038 (0.031)	0.216***(0.084)	0.135***(0.048)	0.079** (0.037)	0.076***(0.024)
Inactive	-0.042 (0.059)	-0.018 (0.042)	-0.018 (0.264)	0.020 (0.142)	0.127** (0.052)	0.029 (0.035)
Noise	0.043 (0.027)	0.061***(0.021)	-0.006 (0.071)	-0.052 (0.042)	0.029 (0.026)	0.067***(0.018)
Pollution	0.038 (0.032)	0.054**(0.025)	0.151* (0.079)	0.047 (0.046)	0.021 (0.029)	0.101***(0.020)
Crime	0.022 (0.032)	0.049** (0.024)	-0.108 (0.107)	-0.107* (0.057)	0.094***(0.032)	0.037* (0.022)
Densely populated area	0.142***(0.031)	-0.137***(0.022)	0.014 (0.071)	-0.012 (0.037)	-0.054** (0.028)	-0.175***(0.019)
Intermediate area	0.103***(0.034)	-0.109***(0.024)	0.044 (0.092)	-0.055 (0.050)	-0.012 (0.025)	-0.138***(0.017)
Political parties/t.u.	0.315***(0.049)	0.092**(0.042)	0.217** (0.090)	0.209***(0.062)	0.275***(0.040)	0.141***(0.033)
Professional part.	0.358***(0.046)	0.126***(0.040)	0.378*** (0.087)	0.292***(0.057)	0.167***(0.038)	0.039 (0.032)
Religious part.	0.724***(0.026)	0.166***(0.022)	0.440***(0.050)	0.220***(0.030)	0.690***(0.022)	0.340***(0.017)
Recreational part.	0.403***(0.029)	0.192***(0.024)	0.735***(0.066)	0.109** (0.051)	0.713***(0.025)	0.325***(0.021)
Other org. part.	0.454***(0.035)	0.337***(0.032)	0.597***(0.075)	0.312***(0.058)	0.513***(0.032)	0.346***(0.029)
Meetings with friends	0.029 (0.024)	0.157***(0.018)	0.026 (0.064)	0.101***(0.037)	0.176***(0.023)	0.096*** (0.015)
Cinema	0.017 (0.028)	0.011 (0.020)	0.115* (0.065)	0.053 (0.036)	-0.001 (0.024)	-0.038** (0.017)
Live performance	0.094***(0.027)	0.120*** (0.020)	-0.055 (0.065)	0.045 (0.035)	0.098***(0.024)	0.099***(0.018)
Cultural site	0.023 (0.026)	0.149***(0.019)	0.250***(0.068)	0.171***(0.043)	0.146***(0.024)	0.157***(0.018)
Sport events	0.039 (0.034)	0.107***(0.025)	-0.160** (0.081)	0.013 (0.045)	0.032 (0.029)	-0.004 (0.021)
Regional dummies	Yes	Yes	Yes	Yes	Yes	Yes
$\rho_{FVIV} = Cov(\varepsilon_{ForVol}, \varepsilon_{InfVol})$	0.143*** (0.014)		0.378*** (0.028)		0.259*** (0.012)	

Note: The symbols ***, **, * denote that the coefficient is statistically different from zero at 1, 5 and 10 percent.