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The impact of volunteering on volunteers in 23 European countries

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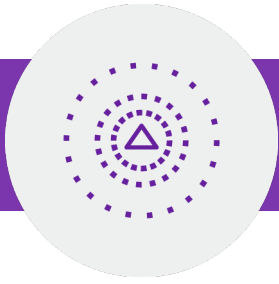
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1 Introduction

Voluntary work may have an impact upon a broad range of stakeholders: volunteers, service users, communities and society at large. Restricting our attention to the positive consequences of volunteering for the involved volunteers, several studies have pointed towards a broad range of benefits. For Rochester *et al.* (2010) the benefits accruing to the *volunteers* can be assessed in terms of increased satisfaction, personal achievement, social networks and relations, skills, personal development, enhanced employability, improved mental and physical health and well-being. In “*Volunteering works*”, Ockenden (2007) categorizes the evidences on the effect of volunteering in five key areas: development, safer and stronger communities, social inclusion, quality of life, and lifelong learning. Similarly, the impact of volunteering can be categorized into five areas or types of “capital”: economic, physical, human, social and cultural (IVR, 2004).

More generally, research has pointed to positive consequences of volunteer work for the volunteer within four areas (Wilson, 2000): citizenship (volunteers are more politically active and trusting than non-volunteers), antisocial behaviour (being a volunteer keeps young people out of trouble), health and well-being (volunteers enjoy better health in old age, have higher self-esteem and self-confidence, higher levels of life satisfaction), and socioeconomic achievement (volunteering may help people find jobs and increase the quality of their jobs).

Research has established a positive relationship between individuals’ volunteering and self-reported health, subjective well-being, and political participation. The literature suggests that people who volunteer enjoy good health (Moen, Dempster-McCain, & Williams, 1993; Musick, Herzog, & House, 1999; Oman, Thoresen, & McMahon, 1999; Post, 2005; Brooks, 2006). They are also more likely to report being happy and are less likely to suffer from depression (Musick & Wilson, 2003; Thoits & Hewitt, 2001; Wheeler, Gorey, & Greenblatt, 1998; Whiteley, 2004, Borgonovi, 2008). There exist also evidences that volunteering positively influences political participation and engagement (Armingeon, 2007).

However, most of the evidence of the positive contribution of volunteering for the volunteers is based on established correlations between volunteering and measures of individual health, well-being or civic engagement. While the correlation between volunteering and well-being is well established, issues of omitted variable bias, self-selection and reverse causation remain mostly unresolved. Confounding unobserved



variables may lead to biased regression estimates of the relationship between volunteering and self-reported health, subjective well-being or political participation.

Measuring impacts supposes to address the question of *causality*, insofar as impacts refer to the causal relationships between the “treatment” and the observed outcomes. This study is devoted to assessing the impact of volunteering on volunteers in terms of health, well-being and political engagement. To do so, the paper investigates the causal impact of volunteering on the three variables of interest (health, well-being and political engagement) by mobilizing matching estimation methods (Caliendo & Kopeinig, 2008; Guo & Fraser, 2015). With the rise of the counterfactual model (Morgan & Winship, 2007) matching estimators have become a useful procedure for estimating the effect of causes. Fundamental to the matching estimation approach is the construction of a control group that is as similar as possible to the treatment group of interest with respect to observable covariates. This approach differs from conventional regression methods to the extent to it does not require the specification of a fully parametric model for the outcomes (no assumptions on functional forms), but estimates the treatment effect non-parametrically by comparing the distribution of outcomes across matched samples (group exposed to the treatment and control group).

2 Empirical strategy

2.1 Problem identification and statistical methods

While the correlation between volunteering and outcomes of interest such as health, well-being and political participation is well established, establishing the existence of a causal impact between volunteering and those outcomes supposes to address issues of omitted variable bias, self-selection and reverse causation. Causal inference of social behaviors is particularly challenging insofar as individuals’ behaviors and individuals’ outcomes (such as health, well-being and political participation) are dependent on individuals’ choices and preferences and consequently endogenous in any causal link between volunteering and individual outcomes under scrutiny here.

Indeed, the observed correlation could be spurious obliterating the effect of potential factors affecting both the propensity to volunteer and the level of the outcomes of interest (omitted variable bias). Additionally, factors that influence individuals’ choice to volunteer might also be correlated with the outcomes of interest (self-selection). Finally,



while volunteering may lead to better health, higher well-being, and higher rate of political participation, the reverse is also possible (reverse causation).

To address these issues, some studies have employed longitudinal datasets whereas others have used instrumental variables estimation (Kawachi et. al., 2013). However, fixed-effect regressions are vulnerable to criticism about individual heterogeneity and self-selection, off-support inference¹, and over-controlling of slow-changing variables. Longitudinal data are generally not sufficient in order to convince the skeptic that endogeneity has been purged from the data, the reason being that a temporal association does not prove that volunteering promote health, well-being or political participation. Two alternative explanations may be provided, either healthy, happy and politically active people are more likely to volunteer or the temporal association is confounded by unobserved heterogeneity, for example personal characteristics (such as temperament or personality traits) that act as a common prior cause to both volunteering and higher outcomes of the variables of interest.

The use of instrumental variable is also vulnerable to criticisms relative to the validity of the instruments. Instrumental variable estimation consists in finding variables being sufficiently correlated with the level of the exposure of interest (volunteering in our case) *and* not being correlated with the outcome of interest ((Angrist & Pischke, 2009).). Examples of instruments are duration of residence in the community as instrument for perception of trust (Kawachi et al 2013), or population heterogeneity such as religious fractionalism as instrument for volunteering (Borgonovi, 2008). The validity of the instruments is dependent on satisfying two conditions: the rank or relevance condition - requiring strong correlation with the exposure variable - and the exclusion or orthogonality condition - requiring no correlation between the instruments and the outcome of interest (no correlation between the instruments and the unobserved error term). Whereas it is possible to test the first condition, the orthogonality condition is essentially untestable because it posits no correlation with the unobserved error term (Kawashi et al., 2013). The validity of the instruments (orthogonality condition) is consequently depending upon the theoretical mechanisms invoked to motivate the various instruments and their degree of veracity and plausibility. For example, Borgonovi (2008) finds a causal effect between volunteering in religious organizations in the U.S. and life satisfaction using religious fractionalism as instrument, but one cannot be sure whether the study does not confound volunteering with religiosity.

¹ Inferences resulting from cells for which no data exist, or model-dependent inferences, have been called “off-support” (Manski, 1995:15-16).



More formally, the impact evaluation problem consists in comparing outcomes Y across treated and non-treated individuals i , and can be summarized through the following equation:

$$Y_i = \alpha X_i + \beta T_i + \varepsilon_i, \text{ where:}$$

T is a dummy equal to 1 for those who participate and 0 for those who do not participate;

X is the set of other observed characteristics of the individual;

ε_i is an error term reflecting unobserved characteristics that also affect Y .

The problem with estimating this equation is, as already stated, that the assignment into the “treatment group” is not random because of self-selection and other cause of endogeneity. Self-selection might be based on observed characteristics – and can be controlled for, unobserved factors, or both. In the case of unobserved factors, the error term in the equation will contain variables that are also correlated with the treatment dummy T . One cannot measure—and therefore control for—these unobserved characteristics, which leads to *unobserved selection bias* ($cov(T, \varepsilon) \neq 0$) and entailing violation of one of the key assumptions of ordinary least squares in obtaining unbiased estimates (independence of regressors from the disturbance term ε).

2.2 Matching estimators

Matching estimators are used in order to construct a control group to be compared with the “treatment group” by modeling the probability of participating in the treatment given the observed characteristics of the participants in the “treatment group”. Participants are then matched on the basis of this probability to nonparticipants. The average treatment effect is then the mean difference in outcomes across these two groups.

Matching estimators are based on the idea of comparing the outcomes of individuals that are as similar as possible with the exception of their “treatment” status, in our case volunteering or not volunteering. In the following analysis two “similarity measures” are implemented in order to match individuals: Nearest-Neighbor Matching (NNM) and Propensity Score Matching (PSM). NNM is accomplished by calculating the “distance” between pairs of individuals with regard to a set of covariates (the propensity score) and then matching each individual to comparable (i.e. closest) individuals. Individuals in the treatment and control groups having the lowest distance on the basis of a set of



covariates are matched. PSM matches individuals on the basis of on the estimated predicted probabilities of treatment (propensity scores).

The validity of propensity score matching depends on the satisfaction of two conditions: the “conditional independence condition” -entailing that unobserved factors do not affect participation -, and the “common support condition” -guaranteeing a significant overlap in propensity scores across the participant and nonparticipant groups. The credibility of the conditional independence (or unconfoundedness) condition has to be assessed on theoretical grounds (Caliendo & Kopeinig, 2008). A violation of the common support condition is a major source of evaluation bias (Caliendo & Kopeinig, 2008), the most straightforward way to test this condition being a visual analysis of the density distribution of the propensity scores in both groups.

2.3 Data

The analyses are based on the European Social Survey data (European Social Survey, 2012). Data for 23 countries (European Union countries : Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Lithuania, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom. Non-European Union countries: Iceland, Norway) were selected for the analyses. For each country, the data consist of a representative sample of the population including all persons aged 15 and over resident within private households, regardless of their nationality, citizenship, language or legal status.

2.4 Variables and measurement

Our main explanatory variable is individual volunteering (considered as the “treatment”). The dichotomous variable (volunteered/ did not volunteer) is constructed on the basis of the question “in the past 12 months, how often did you get involved in work for voluntary or charitable organizations?”. Individuals can respond to this question in five categories ranging from “at least once a week” to “never”. This way of asking whether respondents have done voluntary work is known for understating the level of volunteering compared



to the formulation where respondent are presented with a list of organizations and asked for each type of organization whether they have done voluntary work.

The paper analyzes how volunteering is associated with self-reported health, happiness, and political engagement. The self-reported health indicator is based on the questions: “How is your health in general?”- with answers classified in different categories, “very good, good, fair, not very good, poor”. Despite some controversy over the adequacy of self-reports of health, the indicator of self-perceived health status has the advantage of summarizing in a single measure a broad range of dimensions of health. Self-reported health, for example, is an important predictor of mortality (Idler & Benyamini, 1997) and of the onset of disability and stress levels (Farmer & Ferraro, 1997). The relationship between self-reported health and mortality does not vary by socio-economic group, while small differences were observed by gender and ethnic group (Franks, Gold, & Fiscella, 2003; van Doorslaer & Gerdtham, 2003).

The subjective well-being indicator used in the analyses is a measure of people’s evaluations of their lives as a whole (Kroll, 2008) elicited by a widely used generalized single-item question: “All things considered, how satisfied are you with your life as a whole these days?” on a scale from 1 completely dissatisfied to 10 completely satisfied. It is a cognitive assessment rather than a statement of a person’s current emotional state. The international differences in subjective well-being are quite remarkable. In cross-national studies, national mean life satisfaction scores usually range between ca. 3 and 8 on a scale from 1 to 10. All subjective survey data is subject to a range of disadvantages. A respondent’s answer can be influenced by ordering effects (what item precede the question), wording effects, scale effects, social desirability and cognitive dissonance (Bertrand & Mullainathan ,2001).

Political engagement is measured by the play of an index that sums up the widely recognized dimensions of political engagement: voting, consumer participation, party activity, and protest activity (Armingeon, 2007; Bryoni & Mascherini, 2009; National Research Council, 2014; Brunton-Smith & Barrett, 2015; Pancer, 2015). The index (ranging from 0 to 6) is constituted by the sum of six dichotomous variables reflecting different dimensions of political engagement. Voter turnout is elicited by the play of the question “did you vote in the last national election?). The propensity of the respondents to engage in political activities other than voting is measured through the following question (five items, the items relative to party and organization work not being taken into consideration for our purpose): “During the last 12 months, have you done any of



the following: a) contacted a politician, government or local government official, b) worn or displayed a campaign badge/sticker, c) signed a petition, d) taken part in a lawful public demonstration, e) boycotted certain products?”.

We use a broad set of control variables in order to account for the factors influencing volunteering. The probability of participating in the treatment group - given the observed characteristics of the participants i.e. the propensity of volunteering - is estimated on the basis a set of socio-demographic and contextual factors that are known to be associated with volunteering (Musick & Wilson, 2008; Wilson, 2012). Socio-demographic variables include age, educational attainment, gender, employment status, marital status, size of the household, whether they have children living in the household, household income, weekly worked hours. Social resources individuals can rely on are controlled for by including measures of the number of people respondents can discuss intimate matters with and how often they meet socially with friends, relatives or work colleagues.

The summary statistic of the data set used for the analyses is presented in table 1.

Table 1: Summary statistics

Variables	Mean	Std. Dev.
Volunteering (0/1)	.3566294	.4790084
Self-Reported Health (0 = very good or good; 1 = fair, bad or very bad)	.3675444	.4821408
Subjective well-being	7.775758	7.632019
Index Political Engagement	1.377898	1.147291
Age	50.61987	50.38019
Gender	1.546211	.5150553
Household Income	20.1012	30.60862
Employment status: paid work		
Employment status: education	.3374426	.4728416
Employment status: unemployed	.0121084	.1093707
Employment status: unemployed not seeking job	.0277651	.1643005
Employment status: disabled	.0116511	.1073105
Employment status: retired	.0135899	.1157819
Employment status: community or military services		
Employment status: housework	.1422823	.3493426
Total weekly hours worked	.0006585	.0256523
Meet Friends Less Once a Month	.1074571	.3096963
Meet Friends Once a Month	164.6394	277.4196
Meet Friends Several Time a Month	.0226071	.1486488
Meet Friends Once a Week		
Meet Friends Several Time a Week	.1024454	.303236
Meet Friends Every Day	.1944104	.3957497
Number of People To Discuss Intimate Matters=1	.1675781	.3734947
Number of People To Discuss Intimate Matters=2	.2567812	.4368617
Number of People To Discuss Intimate Matters=3	.1552503	.3621464
Number of People To Discuss Intimate Matters=4_6		
Number People To Discuss Intimate Matters=5_7	.1775831	.3821649
Number of People To Discuss Intimate Matters=10 or More	.2246081	.4173278
Marital Status Civil Union	.2176577	.4126572
Marital Status Separated	.2310647	.4215176
Marital Status Divorced	.0423609	.2014131



Marital Status Widowed		
Marital Status None of These	.0354471	.1849087
Education Less Lower Secondary	.0054506	.0736273
Education Lower Secondary	.0053408	.0728863
Education Lower Tier Upper Secondary	.0924771	.2897009
Education Upper Tier Secondary	.0976167	.2967985
Education Advanced Vocational		
Education Lower Tertiary	.2834854	.4506941
Education Higher Tertiary	.1078595	.3102057
Number of people living in household	.179595	.3838533
Children living at home (0/1)	.1354233	.3421783
Gender	.2217365	.4154186
Household Income		
Employment status: paid work	.1341796	.3408483
Employment status: education	.0918003	.2887465
Employment status: unemployed	.122748	.3281507
Employment status: unemployed not seeking job	2.839958	2.626711
Employment status: disabled	1.616941	.4944932
Number of observations	54673	

3 Results and discussion

The basic idea of matching is to create a control group whose individuals are similar to the individuals in the treated group in terms of background characteristics (education, income, socio-economic status, etc.). The difference in outcome between the control group and the treated group measures the treatment effect.

The “common support” hypothesis requires a significant overlap in the distributions of the propensity scores between the control and the treated groups in order to avoid unreliable matching. The treated group includes respondents who have volunteered during the past 12 months. The outcomes of the treatment are three variables: self-reported health, self-reported well-being, and political engagement measured through an index. Following Stuart (2010), we first use logistic regression to estimate the propensity score (including all characteristics that are known to affect both the treatment assignment and the outcome based on the theory and previous research). Second, we match the control and treated groups using propensity score matching (PSM) and nearest neighbor matching (NNM). In order to assess the impact of volunteering on volunteers we estimate the average treatment effect on self-reported health, happiness, and political engagement of volunteering using both Nearest-Neighbor Matching (NNM) and Propensity Score Matching (PSM). Before proceeding to these estimations, we test the



validity of the “common support condition”, guaranteeing a significant overlap in propensity scores across the participant and nonparticipant groups.

3.1 Estimating Propensity Score

In order to calculating the propensity scores, we use a logistic regression, the dependent variable being “volunteering”.

Table 3: Logistic regression: volunteering

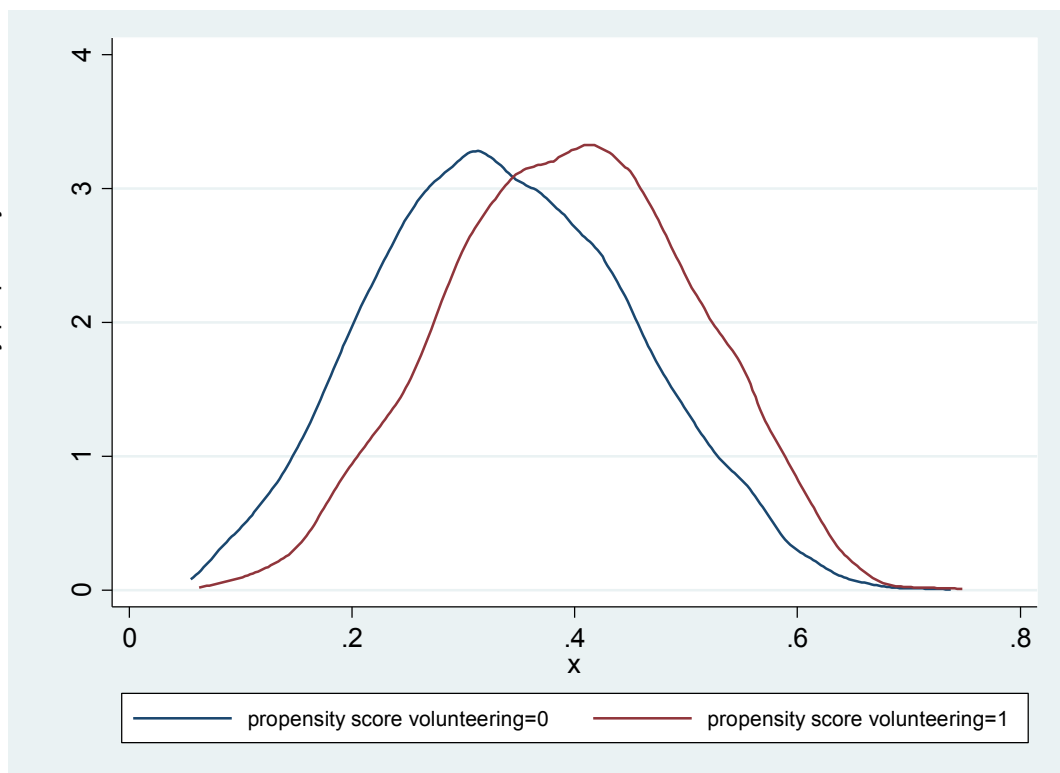
Logistic regression		Number of obs = 54673		
Log pseudolikelihood = -33952.129		Wald chi2(39) = 6583.75		
		Prob > chi2 = 0.0000		
	Coef.	Robust Std. Err.	Z	P>z
Age	-.0047302	.0008494	-5.57	0.000
Age2	4.41e-06	8.49e-07	5.20	0.000
Gender	-.0414477	.0187367	-2.21	0.027
Household Income	-.0006307	.0003139	-2.01	0.045
Employment status: paid work	-.0626945	.0276186	-2.27	0.023
Employment status: education	.0500574	.0826291	0.61	0.545
Employment status: unemployed	-.3220617	.0617912	-5.21	0.000
Employment status: unemployed not seeking job	-.3763368	.0928031	-4.06	0.000
Employment status: disabled	-.1563808	.0826715	-1.89	0.059
Employment status: retired	-.1785419	.0383171	-4.66	0.000
Employment status: community or military services	-.1747935	.3696084	-0.47	0.636
Employment status: housework	-.0333696	.0314563	-1.06	0.289
Total weekly hours worked	-.0002162	.000037	-5.85	0.000
Meet Friends Less Once a Month	-.4652944	.09202	-5.06	0.000
Meet Friends Once a Month	.2245696	.0438301	5.12	0.000
Meet Friends Several Time a Month	.4080394	.03835	10.64	0.000
Meet Friends Once a Week	.4527159	.0391839	11.55	0.000
Meet Friends Several Time a Week	.7193942	.0373115	19.28	0.000
Meet Friends Every Day	.67532	.0402998	16.76	0.000
Number of People To Discuss Intimate Matters=1	.1184549	.0443257	2.67	0.008
Number of People To Discuss Intimate Matters=2	.2616317	.0429413	6.09	0.000
Number of People To Discuss Intimate Matters=3	.476886	.0430416	11.08	0.000
Number of People To Discuss Intimate Matters=4_6	.6601553	.0429766	15.36	0.000
Number People To Discuss Intimate Matters=5_7	.8468741	.0577653	14.66	0.000
Number of People To Discuss Intimate Matters=10 or More	.8079511	.0605704	13.34	0.000
Marital Status Civil Union	-.0161742	.1252919	-0.13	0.897
Marital Status Separated	.1379716	.123837	1.11	0.265
Marital Status Divorced	-.2758302	.038909	-7.09	0.000
Marital Status Widowed	-.4533936	.0464806	-9.75	0.000
Marital Status None of These	-.2326735	.0321708	-7.23	0.000
Education Less Lower Secondary	-1.160733	.0759395	-15.28	0.000
Education Lower Secondary	-1.102661	.0701597	-15.72	0.000
Education Lower Tier Upper Secondary	-.829523	.0711924	-11.65	0.000
Education Upper Tier Secondary	-1.043085	.0689643	-15.12	0.000
Education Advanced Vocational	-.7470814	.0709563	-10.53	0.000



Education Lower Tertiary	-.5744177	.0734761	-7.82	0.000
Education Higher Tertiary	-.583213	.0717621	-8.13	0.000
Number of people living in household	-.0005406	.0034735	-0.16	0.876
Children living at home (0/1)	-.0406474	.0215345	-1.89	0.059

On the basis of the results of the logistic regression we can now predict the propensity scores and look at the distribution of the propensity scores for the group of volunteers and the group of non-volunteers. The results displayed in figure 1 show a normal distribution in both groups. The figure shows also that the “common support condition” is satisfied: the propensity scores for volunteers and non-volunteers overlap significantly.

Figure 1: K-density distribution of propensity scores for volunteers and non-volunteers



3.2 Assessing the matching quality: balance of cofounders between treated and untreated after matching

Before analyzing the data, we need to assess the extent to which our model for estimating propensity scores is valid. In order to assess the validity of our model we compare the control variables for the group of volunteers (treatment group) and the group of non-volunteers (control group) before and after matching. The “standardized differences” (differences in terms of standard deviation) show the extent to which the groups differ in terms of socio-economic and contextual variables before and after matching.

Table 2: Standardized differences between volunteers and non-volunteers before and after matching

	NNM		PSM	
	Raw	Matched	Raw	Matched
Age	-.0661893	-.0031968	-.0661893	.009371
Age2	-.0128695	-.0005944	-.0128695	.011945
Gender	-.0269598	-.0034228	-.0269598	.0039915
Household Income	-.0149281	-.0395346	-.0149281	.0145154
Employment status: paid work	.1390253	.0041064	.1390253	-.0011622
Employment status: education	.043048	.0006716	.043048	.0040144
Employment status: unemployed	-.0454633	-.0013419	-.0454633	.0097871
Employment status: unemployed not seeking job	-.037519	-.0005124	-.037519	.0047769
Employment status: disabled	-.0219116	-.0004758	-.0219116	.000161
Employment status: retired	-.0760361	-.007175	-.0760361	-.003744
Employment status: community or military services	-.0015385	0	-.0015385	-.0136252
Employment status: housework	.0334202	-.0112674	.0334202	-.0017949
Total weekly hours worked	-.1139887	-.0413909	-.1139887	.0070636
Meet Friends Less Once a Month	-.1638498	-.0022275	-.1638498	.0015945
Meet Friends Once a Month	-.0977018	-.0046754	-.0977018	.0004816
Meet Friends Several Time a Month	-.0190664	-.0063535	-.0190664	.0042083
Meet Friends Once a Week	.005454	.0009337	.005454	-.004025
Meet Friends Several Time a Week	.1891709	.0134565	.1891709	.0102961
Meet Friends Every Day	.0994342	-.0013705	.0994342	-.0033807
Number of People To Discuss Intimate Matters=1	-.1890216	-.0096745	-.1890216	-.0052916
Number of People To Discuss Intimate Matters=2	-.0972176	-.0006583	-.0972176	.0021095
Number of People To Discuss Intimate Matters=3	.060304	-.0005322	.060304	-.0059413
Number of People To Discuss Intimate Matters=4_6	.2021712	.0136898	.2021712	.0031648
Number People To Discuss Intimate Matters=5_7	.1264225	-.0004555	.1264225	.0066694
Number of People To Discuss Intimate Matters=10 or More	.1032843	-.000595	.1032843	.0000985
Marital Status Civil Union	.0260962	0	.0260962	.0041482
Marital Status Separated	.0202152	0	.0202152	-.0009929
Marital Status Divorced	-.0435079	-.0058557	-.0435079	-.0027309
Marital Status Widowed	-.1737455	-.0016717	-.1737455	-.0017318
Marital Status None of These	.0653743	-.005252	.0653743	-.0004461
Education Less Lower Secondary	-.1497941	-.0043844	-.1497941	.0180134
Education Lower Secondary	-.1111396	-.0104913	-.1111396	.0043994
Education Lower Tier Upper Secondary	.0283965	-.000589	.0283965	-.0041329
Education Upper Tier Secondary	-.0880659	.009	-.0880659	-.0039257
Education Advanced Vocational	.057957	.0035465	.057957	-.0052202
Education Lower Tertiary	.1493023	.0006357	.1493023	-.0043029
Education Higher Tertiary	.1453041	.001286	.1453041	-.0063366
Number of people living in household	.0601117	-.0063985	.0601117	.00146
Children living at home (0/1)	-.0428649	.0097326	-.0428649	-.003991



The standardized differences are all close to zero after matching and have been significantly reduced as a result of matching. By comparing the raw and matched columns in the table, for nearest neighbor matching (NNM) and propensity score matching (PSM) we can see significant reduction in the bias (standardized difference between control and treated groups) before and after the matching for most of the variables.

3.3 Treatment effect on self-reported health of volunteering

We first estimate the treatment effect of volunteering on self-reported health for both the 23 European countries considered together and for each of the 23 European countries separately. Table 5 and 6 display the results in terms of correlation coefficient, regression (logistic) coefficient without control variables, regression (logistic) coefficient including control variables (age, age2, gender, household income, employment status, worked hours, meet Friends frequency, number of people to discuss intimate matters, marital status, education level, number of persons living in the household, children in the household), average treatment effect estimate using Nearest-Neighbor Matching, and average treatment estimate using Propensity Score matching.

Table 5 shows a positive (but weak in magnitude) effect of volunteering on self-reported health for the sample as a whole (23 European countries taken together). Since self-reported health is coded 0 when very good or good, a negative estimate entails a positive effect. Both matching estimators give approximately the same estimate. The difference between the regression coefficient with control variable (-0,278) and the matching estimator (0,051) indicates that much of the effect in the regression coefficient is related to endogeneity, most probably to self-selection of healthy individuals into the volunteer group.

Table 6 shows the same results disaggregated by country. Much of the same relationship is to be found at the country level, indicating a positive, but weak effect of volunteering on health. However, for many countries the coefficient of the regression with control variables, as well as the average treatment effect estimates are not statistically significant, with the exception of Bulgaria, Cyprus, Germany and the Netherlands. Consequently, our results indicate no effects (and in the best case weak positive effect) of volunteering on the self-reported health of the volunteers.



Table 5: Treatment effect on self-reported health (0 if very good or good; 1 if fair, bad or very bad) and volunteering in Europe (23 European countries), all countries

23 European Countries Together	Correlation Coefficient	Regression Coefficient for Volunteering Without Control Variables	Regression Coefficient for Volunteering With Control Variables (1)	ATE Nearest-neighbor matching (NNM)	ATE Propensity Score matching
	-0,116***	-0,966***	-0,278***	-0,052***	-0,051***

Table 6: Treatment effect self-reported health (0 if very good og good; 1 if fair, bad or very bad) and volunteering in Europe (23 European countries), by country

Countries	Correlation Coefficient	Regression Coefficient for Volunteering Without Control Variables	Regression Coefficient for Volunteering With Control Variables (1)	ATE Nearest-neighbor matching (NNM)	ATE Propensity Score matching
Belgium	-0,071***	-1,264***	-0,073	-0,003	-0,040
Bulgaria	-0,140***	-1,447***	-0,822***	-0,137***	-0,104**
Cyprus	-0,362	-1,781***	-0,362	-0,080**	-0,089**
Czech Republic	-0,022	-0,799***	0,252	0,017	0,054
Germany	-0,116***	-0,625***	-0,275**	-0,065**	-0,058**
Denmark	-0,125***	-1,455***	-0,295	-0,007**	-0,053
Estonia	-0,166***	-0,548***	-0,117	0,074*	-0,036
Spain	-0,022	-0,382***	-0,097	-0,031	-0,009
Finland	-0,088***	-0,941***	-0,146	-0,022	-0,030
France	-0,068***	-0,681***	-0,195	-0,023	-0,046
United Kingdom	-0,120***	-1,292***	-0,210	-0,049	-0,016
Hungary	-0,085***	-0,676***	-0,116	-0,022	-0,004
Ireland	-0,050***	-1,761***	0,019	-0,007	-0,006
Iceland	-0,051	-1,487***	-0,185	-0,054	-0,025
Italy	-0,809***	-0,583***	-0,271	-0,034	0,014
Lithuania	-0,113***	-0,550***	-0,334	-0,036	-0,011
Netherlands	-0,39***	-1,417***	-0,416***	0,096***	-0,067*
Norway	-0,058**	-1,346***	-0,119	-0,013	-0,032
Poland	-0,132***	-1,067***	-0,291	-0,102***	-0,016
Portugal	-0,0005	-0,308**	0,348	-0,044	0,046
Sweden	-0,054***	-1,595***	-0,237	-0,032	-0,015
Slovenia	-0,134***	-0,860***	-0,175	-0,051	-0,037
Slovakia	-0,028	-0,865***	-0,029	0,015	-0,005

(1) Control variables: age, age2, gender, household income, employment status, worked hours, Meet Friends frequency, number of people to discuss intimate matters, marital status, Education level, number of persons living in the household, children in the household.



3.4 Treatment effect on Subjective Well-Being (SWB) of volunteering

We now estimate the treatment effect of volunteering on self-reported well-being for both the 23 European countries considered together and for each of the 23 European countries separately. As it was the case in the previous analysis, Table 7 and 8 display the results in terms of correlation coefficient, regression (logistic) coefficient without control variables, regression (logistic) coefficient including control variables (age, age2, gender, household income, employment status, worked hours, meet Friends frequency, number of people to discuss intimate matters, marital status, education level, number of persons living in the household, children in the household), average treatment effect estimate using Nearest-Neighbor Matching, and average treatment estimate using Propensity Score matching.

Table 7 shows no significant positive effect of volunteering on self-reported well-being for the sample as a whole (23 European countries taken together). The matching estimators give diverging estimates in terms of magnitude, but both being statistically non-significant. The regression coefficients with control variable for the sample as a whole indicate however a positive association between well-being and volunteering, but this relationship is not confirmed by the matching estimators and has to be imputed the self-selection of “satisfied” individuals into the volunteer group.

Table 8 shows the same results disaggregated by country. The matching estimators produce diverging estimates (in terms of magnitude) and are not statistically significant. The regression coefficients with control variable are not statistically significant either, with the exception of Lithuania where volunteering seems to be negatively associated with volunteering.

Our analysis indicates no effects of volunteering on the self-reported well-being of the volunteers.

Table 7: Treatment effect on self-reported well-being of volunteering in Europe (23 European countries) all countries

23 European Countries	Correlation Coefficient	Regression Coefficient for	Regression Coefficient	ATE Nearest-neighbor	ATE Propensity Score matching
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Together	Volunteering Without Control Variables	Volunteering With Control Variables (1)	matching (NNM)	
0,096***	0,355***	0,288***	0,998	0,168

Table 8: Treatment effect on self-reported well-being of volunteering in Europe (23 European countries), by country

Countries	Correlation Coefficient	Regression Coefficient for Volunteering Without Control Variables (with constant)	Regression Coefficient for Volunteering With Control Variables (1)	ATE Nearest-neighbor matching (NNM)	ATE Propensity Score matching
Belgium	0,129***	0,428***	0,160	0,302***	0,101
Bulgaria	0,038	1,408	0,995	0,997	0,614
Cyprus	0,020	0,403	0,445	-0,088	0,645
Czech Republic	0,008	0,507	0,689	0,666	1,403
Germany	0,036***	0,148	-0,050	-0,043	0,063
Denmark	-0,017	-0,231	-0,295	-0,219	0,134
Estonia	0,002	0,231	-0,049	0,079	0,075
Spain	0,006	0,064	-0,006	0,168	0,015
Finland	-0,008		-0,162	-0,114	-0,147
France	-0,073***	0,201	0,096	0,163	0,063
United Kingdom	-0,014	-0,252	-0,281	-0,080	-0,333
Hungary	0,048***	0,580	0,266	0,208	0,201
Ireland	0,063***	0,663	0,346	0,259	0,120
Iceland	-0,024	-0,550	-0,321	-0,175	-0,264
Italy	0,038	0,873	0,972	0,878	0,913
Lithuania	-0,034	-1,015*	-1,429*	-0,824	-1,430
Netherlands	0,041	0,202	0,0494	0,267	0,163
Norway	0,027	0,333	0,365	0,057	0,341
Poland	0,016	0,323	0,656	0,753	-0,067
Portugal	0,032	0,416*	0,348	0,103	-0,315
Sweden	0,005	0,107	0,005*	-0,057	-0,212
Slovenia	0,011	0,141	0,083	-0,066	-0,217
Slovakia	0,059***	0,854	0,954	0,944	1,070

(1) Control variables: age, age2, gender, household income, employment status, worked hours, Meet Friends frequency, number of people to discuss intimate matters, marital status, Education level, number of persons living in the household, children in the household.



3.5 Treatment effect on political engagement of volunteering

Finally, we estimate the treatment effect of volunteering on political engagement for both the 23 European countries considered together and for each of the 23 European countries separately. Table 9 and 10 display the results in terms of correlation coefficient, regression (logistic) coefficient without control variables, regression (logistic) coefficient including control variables (age, age2, gender, household income, employment status, worked hours, meet Friends frequency, number of people to discuss intimate matters, marital status, education level, number of persons living in the household, children in the household), average treatment effect estimate using Nearest-Neighbor Matching, and average treatment estimate using Propensity Score matching.

Table 9 shows a positive and statistically significant effect of volunteering on political engagement for the sample as a whole (23 European countries taken together). Both matching estimators give approximately the same estimate. The difference between the regression coefficient with control variable (0,513) and the matching estimator (0,499) indicates that some of the effect in the regression coefficient is related to endogeneity, but most of the effect remains and has a relatively high magnitude.

Table 10 shows the same results disaggregated by country. Much of the same relationship is to be found at the country level, indicating a positive and statistically significant effect of volunteering on political engagement. The matching estimators are relatively convergent in terms of magnitude of the effect.

Volunteering appears to have a positive effect on political engagement, also when corrected for potential bias.

Table 9: Treatment effect on political engagement of volunteering in Europe (23 European countries) all countries

23 European Countries Together	Correlation Coefficient	Regression Coefficient for Volunteering Without Control Variables	Regression Coefficient for Volunteering With Control Variables (1)	ATE Nearest-neighbor matching (NNM)	ATE Propensity Score matching
	0,293***	0,662***	0,513***	0,499***	0,486***



Table 10: Treatment effect on political engagement of volunteering in Europe (23 European countries), by country

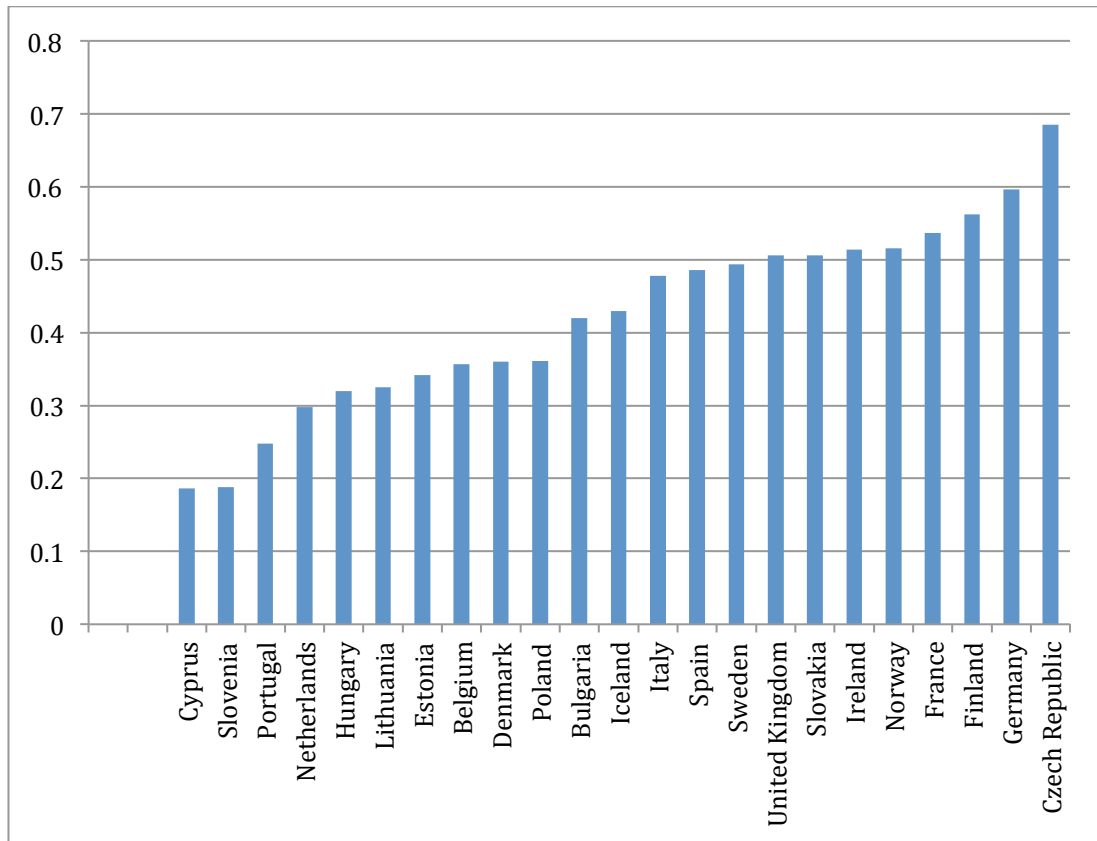
Countries	Correlation Coefficient	Regression Coefficient for Volunteering Without Control Variables	Regression Coefficient for Volunteering With Control Variables (1)	ATE Nearest-neighbor matching (NNM)	ATE Propensity Score matching
Belgium	0,231***	0,472***	0,311***	0,393***	0,357***
Bulgaria	0,224***	0,535***	0,465***	0,565***	0,420***
Cyprus	0,178***	0,519***	0,372***	0,657*	0,186*
Czech Republic	0,259***	0,718***	0,551***	0,657***	0,685***
Germany	0,306***	0,769***	0,613***	0,625***	0,596***
Denmark	0,166***	0,353***	0,281***	0,320***	0,360***
Estonia	0,248***	0,554***	0,463***	0,483***	0,342***
Spain	0,236***	0,613***	0,478***	0,503***	0,486***
Finland	0,322***	0,805***	0,644***	0,680***	0,562***
France	0,293***	0,746***	0,545***	0,644***	0,537***
United Kingdom	0,267***	0,583***	0,425***	0,538***	0,506***
Hungary	0,209***	0,380***	0,312***	0,311***	0,320***
Ireland	0,257***	0,634***	0,526***	0,537***	0,514***
Iceland	0,190	0,545***	0,490***	0,426***	0,430***
Italy	0,223***	0,427***	0,328***	0,461***	0,478***
Lithuania	0,219***	0,376***	0,325***	0,418***	0,325***
Netherlands	0,208***	0,356***	0,257***	0,288***	0,298***
Norway	0,237**	0,684***	0,514***	0,510***	0,516***
Poland	0,270***	0,625***	0,423***	0,485***	0,361***
Portugal	0,153***	0,288***	0,220***	0,242***	0,248***
Sweden	0,175***	0,515***	0,482***	0,489***	0,494***
Slovenia	0,174***	0,296***	0,198***	0,201**	0,188***
Slovakia	0,285***	0,608***	0,547***	0,538***	0,506***

(2) Control variables: age, age2, gender, household income, employment status, worked hours, Meet Friends frequency, number of people to discuss intimate matters, marital status, Education level, number of persons living in the household, children in the household.

Figure 2 displays in increasing order the average treatment effect of volunteering on political engagement for the countries under consideration. The effect appears to be lowest for Eastern European countries, but also for Portugal and the Netherlands, and highest for the Czech Republic, Northern European countries (Finland, Norway), but also France.



Figure 2: Average Treatment Effect of volunteering on political engagement - Propensity Score Matching estimate (23 European countries)



3.6 Discussion

Musick & Wilson (2008) identify different areas where volunteering has been shown to have an impact: citizenship, prosocial behavior, occupation, income and health. Within these areas a variety of impact can be studied, for example, the impact of volunteering on citizenship may be assessed from the viewpoint of civic values, the mechanisms linking volunteering to citizenship (trust, self-efficacy, social networks), and the impact of volunteering upon adolescent development relatively to prosocial behaviors. Similarly, the impact of volunteering on health differentiating mental from physical health, according to different life-phases with a special focus on the elderly, and with emphasis on different mechanisms by which volunteering may have an impact on health, such as social integration, self-concept, or stress-buffering function. Our analysis of the impact of volunteering on volunteers cannot do justice to the richness and variety of areas of



impact, approaches, mechanisms and focus that characterize this literature. Only three areas, health, well-being and political engagement, has been investigated ignoring other potential areas of impact such as income, skills, occupation and career. Additionally, and most importantly, the assessment of the impact of volunteering we have carried on is limited by the type and nature of the data used in the analysis. When it comes to health and well-being we use self-reported items questions, whereas part of the literature use more objective measures of health (such as mortality or health measures extracted from routine records) or well-being (Kroll, 2008; Jenkinson et al., 2013). Another limitation of our data is due to their cross-sectional nature impeding the assessment of impact as a result of changes over time of the variables of interest. Our measure of volunteering (operationalized through a dichotomous variable) is rather gross and does not account for different levels of volunteering.

However, compared to most of the existing literature assessing the impact of volunteering on health (Moen, Dempster-McCain, & Williams, 1993; Musick, Herzog, & House, 1999; Oman, Thoresen, & McMahon, 1999; Post, 2005; Brooks, 2006), well-being (Musick & Wilson, 2003; Thoits & Hewitt, 2001; Wheeler, Gorey, & Greenblatt, 1998; Whiteley, 2004), or political engagement (Armingeon, 2007) which is mostly based on correlation between volunteering and the variable of interest, our results, based on matching estimators, allows to correct for the self-selection which affects the relationship between volunteering and measures of health, well-being, and political engagement. Contrarily to the conclusions of the existing literature, and in spite of its shortcomings, our study shows that volunteering has a minimal impact on self-reported health and no impact on self-reported well-being.

4 Conclusion

In this paper, we have explored the impact of volunteering on the self-reported health, the self-reported well-being, and the level of political engagement of volunteers. Using European Social Survey data for 23 European countries and propensity scores matching estimator we have shown that volunteering has a minimal impact on self-reported health, no impact on self-reported well-being, and a significant impact on political engagement. Our results differ from conventional methodologies that do not account for omitted variable bias, self-selection, and reverse causation. The impact of volunteering on self-



reported health mostly disappears when correcting for these potential sources of bias, but the impact of volunteering on political engagement remains strong.



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