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Volunteering, Happiness and Public Policy

by

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Volunteering, Happiness and Public Policy[☆]

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Abstract

Is the activity of volunteering something that benefits the volunteer as well as the recipient of the volunteer's activities? We analyze this relationship and apply matching estimators to the large-scale British Household Panel Survey (BHPS) data set to estimate the causal impact of volunteering on happiness. We take into account personality traits that could jointly determine volunteering behaviour and happiness. We find that the causal impact of volunteering on happiness is positive and increasing over time if volunteering is sustained. In a quantile analysis, we find that this effect seems to be driven by reducing the unhappiness of the less happy quantiles of the well-being distribution. We test the robustness of our findings and discuss their relevance for public policy.

Keywords: volunteering; happiness; altruism; generosity; public policy; BHPS

1. Introduction

Homo oeconomicus has become a rare breed according to the findings of behavioral economics. Non-selfish behavior as another driving force of human (economic) activity

[☆] The authors are grateful for having been granted access to the BHPS data set, which was made available through the ESRC Data Archive. The data were originally collected by the ESRC Research Centre on Micro-Social Change at the University of Essex (now incorporated within the Institute for Social and Economic Research). Neither the original collectors of the data nor the Archive bear any responsibility for the analyses or interpretations presented here. We wish to thank Chris Boyce and the participants of the workshop "New Frontiers in Normative Economics: Towards Behaviorally Informed Policy Making" in Freiburg for helpful hints and suggestions. Errors are ours.

has made its way into economists' thinking and modeling, and it is relevant in many respects: examples include private fund-raising, organ donations, intergenerational transfers, the funding of public goods as well as support for charities. But altruistic behavior does not only benefit the recipient of this behavior. Based on clinical evidence, studies have established a positive relationship between individuals' volunteering activities and their own health (Post, 2005). A similarly positive relationship was found for volunteering and subjective well-being in a German sample (Meier and Stutzer, 2008). In the present paper, it is this latter relationship we are interested in.

In the empirical part of our paper, we analyze how volunteering is related to individuals' subjective well-being (or "happiness"). We apply our analysis to a large-scale British sample (using data from the British Household Panel Survey for a time span of 15 years). Comparing our results for a different country to the results of Meier and Stutzer (2008) is useful in itself to see whether the volunteering-happiness relationship may differ across countries or cultures. But apart from this, we contribute to the literature in several further ways. First, we aim at addressing some unresolved questions regarding the confounding role unobserved variables may play in conventional estimations of the effect volunteering has on subjective well-being (Dolan et al., 2008, p. 104). For example, (stable) personality traits of an individual may (jointly) influence the degree of volunteering as well as self-reported subjective well-being or lead to self-selection of subgroups into altruistic behaviors: especially "agreeable" persons,¹ who tend to be more cooperative, might self-select into volunteering behaviors, biasing any regression estimates not accounting for this self-selection. To address these problems we first analyze the impact of volunteering on subjective well-being with reference to different personality traits. This has only recently become possible for big household panel data sets, as personality inventories have not been elicited in them up to a short time ago.

Second, we offer an econometric account of the causal impact of volunteering on subjective well-being by making use of "propensity score matching" estimators (Rubin, 1974; Imbens, 2004; Caliendo and Kopeinig, 2008). Propensity score matching is an econometric technique that pays special attention to the information on the distribution of covariates in the treatment versus control groups (so as to allow us to compare

¹ Agreeableness is one of the "Big Five" personality traits (McCrae and Costa, 2003).

individuals that have the similar values for all covariates). If there is no substantial overlap in the two covariate distributions, multivariate regression estimates rely heavily on extrapolation, and can therefore be misleading (Imbens, 2004; Ichino et al., 2008, p. 312-13). Matching estimators are preferable because more care is taken to establish an appropriate control group. They also require no assumptions on functional forms (Hussinger, 2008, p. 730). While widely used in other subfields, to our knowledge, matching estimators have only recently been introduced to the analysis of subjective well-being and its causes and correlates (e.g., Binder and Coad, 2010b).

Our third contribution lies in examining the extremes of the subjective well-being distribution via quantile regressions (Koenker and Bassett, 1978; Koenker and Hallock, 2001). In heterogeneous distributions, regression methodologies that focus on means might seriously under- or overestimate effects or even fail to identify effects at all (Cade and Noon, 2003). Applying quantile regressions in our context, we are able to assess whether the (average) effect of volunteering on happiness that is usually found in the literature might actually be driven by the effect that volunteering has for especially happy or unhappy individuals (the extremes of the distribution).

Finally, we provide a discussion of the implications of our findings for public policy. If volunteering increases the well-being of all individuals involved, can increased volunteering lead to a happier society? Considering the increasing debt level in ageing OECD countries, would it be wise to encourage more volunteering to combat financial gaps and labor shortages, and if so, what policy means are available? Answers to these questions are not as obvious as one might think, considering the possibility of crowding out intrinsic altruistic motives by incentivizing volunteering. These questions become more urgent, the less the (welfare) state is able to provide for the less well off of its citizens, and we will therefore discuss prospects and pitfalls associated with them.

The paper is organized as follows. We discuss the theoretical background regarding the volunteering-happiness relationship and derive hypotheses for the empirical work in Section 2. The empirical part of our paper consists of Section 3, where we discuss our econometric strategy, the BHPS data set as well as our findings and robustness checks.

We then give particular attention to the implications our analysis might have in the context of public policy in Section 4 before concluding in Section 5.

2. Volunteering, altruism and happiness

For the purpose of the present paper, we are interested in volunteering that we understand to be mainly an expression of altruism. “Altruism” is a broad notion that comes in many different guises (Becker, 1974; Andreoni, 1989; Khalil, 2004; Konow, 2010). It can pertain to the charitable giving of money (donations) or to volunteering (the giving of one's time). Different classification schemes for altruism have been proposed in the literature, for example with regard to whether the donor also benefits from altruistic behavior or not (e.g., Konow, 2010): if an individual simply has a preference for another person's benefit, this would constitute a case of “pure altruism” (Becker, 1974), whereas “impure altruism” would be behavior where the altruist experiences a “warm glow” (Andreoni, 1989; 1990) resulting from the behavior, i.e. altruistic behavior is beneficial for both donor and recipient (in the extreme, the “altruist” would exhibit this behavior only because of the pleasurable feelings for him, Harbaugh, 1998). Especially in the case of volunteering, it seems plausible that indeed the volunteer donates spare time not only for purely other-regarding reasons: it seems well possible that volunteer work is done for the social component of getting together with like-minded persons (e.g. in religious or other non-profit organizations). As our data later on will not tell us why people volunteer, we are forced to be less interested in the exact motivational underpinning of volunteering but more in the question whether a “warm glow” can be expected from what is usually considered to be altruistic behavior, whether this warm glow is stable, whether the typical volunteer might get used to the pleasure and hence loses interest in volunteering over time, and whether the direction of causality is indeed from volunteering to happiness or vice versa.

The literature on happiness (synonymously called “subjective well-being”, SWB, here) has bloomed in recent years (reviews provide, e.g., Easterlin, 2003; Frey and Stutzer, 2005; Dolan et al., 2008). In the interpretation of the term “happiness” we can broadly distinguish between affective and cognitive layers of well-being, but most of the (empirical) literature seems to be centered on a cognitive interpretation of subjective

well-being. This is reflected in the notion of subjective well-being understood as “life satisfaction”: the interest lies in the cognitive aspect, making well-being a cognitive judgement-cum-endorsement, i.e. an attitude which one holds towards one's life (see, e.g., Frey and Stutzer, 2002). But can subjective well-being actually be validly and reliably be measured? Psychologists have dealt with this question for decades and established the reliability and validity of such subjective well-being constructs (Diener et al., 1999). It is shown that there is a strong correlation between such well-being constructs and emotional expressions like smiling (Fernandez-Dols and Ruiz-Belda, 1995) and brain activity (Shizgal, 1999). Low satisfaction scores lead individuals to discontinue unsatisfactory behaviors (Kahneman et al., 1993; Shiv and Huber, 2000), thus also relating subjective well-being measures to choice behavior. Moreover, there are studies that demonstrate that individuals are to a certain extent able to (ordinally) compare and assess other individuals' levels of satisfaction or happiness (Sandvik et al., 1993; Diener and Lucas, 1999). While there are certainly difficulties related to the practical elicitation of subjective well-being measures, a broad consensus emerged within the literature that these quite reliably measure the intended individual well-being. Well-being is determined to some extent by genes (Lykken and Tellegen, 1996) and by quite stable psychological personality traits (Diener et al., 1999), and hence shows some intertemporal stability. But it can be influenced (temporarily) by many economically relevant life events and even permanently by several other life events such as repeated unemployment, marriage or child birth (Headey, 2010). The test-retest reliability of subjective well-being constructs lies between 0.5 and 0.7 (over two weeks, both for cognitive and affective measures, see Krueger and Schkade, 2008), which is in a range that allows meaningful analysis.

There is a number of studies that relate altruistic behavior such as volunteering to subjective well-being and the consensus is that there is a stable association between altruism and happiness (e.g., Dolan et al., 2008; Post, 2005; Brooks, 2006). Many of these studies are correlational in nature so that one should be cautious as to the way the causal arrow runs (Dolan et al., 2008, p. 104). Most importantly in our context, it has been found for the GSOEP that regular volunteering increases life satisfaction (Meier and Stutzer, 2008), however the study did not control for social norms or trust. This effect has also been found for volunteering in religious organizations in the US, but one

cannot be sure whether this does not confound altruism with religious motives (Borgonovi, 2008). Greenfield and Marks (2004) show that volunteering increases positive affect for the elderly, which might be the result of decreasing the isolation elder individuals often find themselves in. Aknin et al. (2010) show that prosocial spending is also correlated with happiness over a wide range of countries. In comparing widely diverging countries, they infer that the associational relationship is indeed causal. It has been also observed that altruism is beneficial for physical and mental health more general (Post, 2005). From a psychological point of view it makes sense that charitable giving should benefit the donors, as it may increase their self-esteem and confidence, and give (additional) meaning to their life. These findings notwithstanding, Thoits and Hewitt (2001) have shown that happy people volunteer more so that it can be conjectured that the relationship is bi-directional. Brooks also argues in favor of this bi-directionality hypothesis (and presents evidence in favor of it) and calls this a “virtuous circle”: individuals who are altruistic profit from their behavior in terms of being more (economically) successful and happier and this in turn reinforces their altruistic behaviors, creating a socially beneficial upwards spiral (Brooks, 2006, 2007). It is important to note two complications of this relationship. First, altruistic behavior understood as caregiving to family members has been shown to depress subjective well-being considerably (Hirst, 2005). This can be explained with the loss of self-determination involved in caring for family as opposed to voluntary altruistic acts towards strangers. The second complication arises out of the complex interactions altruism can show with factors that also influence subjective well-being. One factor here are personality traits. Another potentially confounding factor would probably be income, as one could argue that the amount of spending for charity increases as a (unknown) function of an individual's income. For our analysis, the latter might not be as big a concern as one might *prima facie* think, as it has been shown that income is empirically not directly related to the amount of volunteering (Brooks, 2007).

Beside these relationships, subjective well-being is also influenced by (and in turn influences) a complex interacting web of other factors (Binder and Coad, 2010a). An individual's happiness depends on individual determinants (e.g., self-esteem, optimism), socio-demographic (such as gender, age, education, or marital status), economic (such as income, status, or unemployment), situational (such as health, social relationships), and

even institutional factors (Dolan et al., 2008; Frey and Stutzer, 2002, pp. 10-1). For our study, the relationship between happiness and income (e.g., Easterlin, 2001; Stevenson and Wolfers, 2008; Clark and Senik, 2010), happiness and health (Easterlin, 2003; Dolan and Kahneman, 2008) as well as happiness and the social domain (marriage is probably the most prominent covariate, see, e.g., Plagnol and Easterlin, 2008) are of utmost importance. Other social relationships, for example with family and friends, are also positively associated with happiness (Lelkes, 2006; Pichler, 2006; Baker et al., 2005); nevertheless, causality might run in the other direction as well, insofar as happy individuals might be socially more agreeable and thus have more friends and socially more fulfilling relationships. If volunteering is undertaken for social reasons, one could potentially confound this with the act of selflessly volunteering to help others. Another well-researched area concerns the effects of unemployment on happiness (see, e.g., Clark and Oswald, 1994; Lucas et al., 2004). Although personality traits, belonging to the category of individual determinants, have been recognized as quite important in determining subjective well-being in the psychological literature (DeNeve and Cooper, 1998; Gutierrez et al., 2005), most economic analyses neglect this insight, a possible source of omitted variable bias. As Dolan et al. (2008, p. 94) point out, despite extensive psychological research in this field, few studies use large scale survey data to examine the happiness-personality relationship (but see, e.g., Boyce 2010, Boyce et al. 2010). Accounting for personality traits is not an easy feat to accomplish since large-scale data sets, such as the BHPS (or the German Socio-Economic Panel, SOEP), only very recently incorporated personality trait scales into the survey questionnaires.

Difficulties with data availability notwithstanding, it is plausible that subjective well-being is influenced by quite stable psychological personality traits (Diener and Lucas, 1999). We later are able to make use of respondents' self-ratings along the "Big Five" personality dimensions of "Extraversion", "Agreeableness", "Conscientiousness", "Neuroticism" and "Openness" (Digman, 1990; McCrae and Costa, 2003; Gosling et al., 2003).² These "[f]ive dimensions represent personality at the broadest level of abstraction, and each dimension includes a large number of distinct, more specific personality characteristics" (Benet-Martinez and John, 1998, p. 730). Extraversion refers to sociability, assertiveness, activity, positive emotions (etc.), while Agreeableness

² We capitalize these trait names when referring to their specific meaning as a "Big Five" personality trait.

describes one's quality of interpersonal relations, including traits such as altruism, trust, cooperation and such. In this short description, we already see the potential confounding role this specific personality trait might play for the analysis of the altruism-happiness-relationship. Conscientiousness describes goal-directed task behavior and socially mandated impulse control. Neuroticism relates to emotional instability, anxiety and irritability. Finally, Openness details traits related to creativity, flexibility, or the extent of one's experiences more general. The latter trait is probably the most vaguely described and controversial (DeNeve and Cooper, 1998, p. 199). These personality traits should ideally be further disaggregated within the five dimensions. Nevertheless, the "Big Five" are widely recognized as an empirically driven and useful characterization of personality. Their high level of abstraction (and their vagueness about the many sub-traits contained in each dimension) facilitates their robust use across different cultural contexts (Benet-Martinez and John, 1998). It seems reasonable to assume that personality evolves over time, especially when young, or when comparing long time horizons (see Boyce et al. 2012; Donnellan and Lucas, 2008; Srivastava et al., 2003). But there is also evidence that the traits mentioned prove to be quite stable from the age of thirty onwards (Costa and McCrae, 1994), or only change quite slowly over the course of a human life (Hampson and Goldberg, 2006).

Psychological research hypothesizes that Extraversion and Neuroticism have an influence on subjective well-being (DeNeve and Cooper, 1998). Theoretically less clear, it has been argued that Agreeableness and Conscientiousness might also have a positive bearing on subjective well-being through facilitating positive experiences and social interactions (see, e.g., Hayes and Joseph, 2003). This motivates our inclusion of social control variables in the later analysis to disentangle any confounding effects between social relations and altruism. Since Openness would facilitate positive as well as negative experiences, no expectations seem *prima facie* reasonable. In large household samples so far, only moderate relationships between personality traits and subjective well-being were found (Helliwell, 2006); for example, unhappiness resulting from unemployment is moderated by personality traits, such that extroverts suffer less from unemployment (Clark and Georgellis, 2010) while conscientious individuals do suffer comparatively more (Boyce et al. 2010).

On the basis of this literature background we derive the following hypotheses for our empirical analysis of the relationship between subjective well-being and volunteering:

Hypothesis 1a: Volunteering increases individual subjective well-being.

Hypothesis 1b: The more intensely individuals volunteer, the happier they are.

Hypothesis 2a: The influence of volunteering on subjective well-being is in parts determined by personality traits along the Big Five personality dimensions. Personality traits affect both subjective well-being and volunteering.

Hypothesis 2b: Individuals with stable high personality trait expressions of Agreeableness volunteer more than those persons with low trait expressions.

3. Empirical analysis

3.1. Empirical strategy

The empirical strategy applied in this paper is threefold. First, we start by analyzing the relationship between volunteering and subjective well-being in a series of fixed-effects regressions (hypothesis 1), taking into account some of the reservations expressed in the literature background section above. In particular, we use social variables to control for any variance the volunteering variable might capture solely due to individuals volunteering for social reasons. We also explore the confounding role of “trust” that has been remarked to trouble many analyses so far (Dolan et al., 2008, p. 104). In our view, this influence points to the role that personality traits play for volunteering (as an expression of altruism): trust is usually seen as a characterizing description of Agreeable individuals. The “Big Five” character traits include other traits beside “Agreeableness” that also may play a role in the volunteering-happiness relationship and that might lead to omitted variable bias if not accounted for. Therefore, we analyze this relationship for subgroups with high or low trait expression in these dimensions (hypothesis 2).

However, fixed-effects regressions are vulnerable to criticism about self-selection, functional form specifications, off-support inference and over-controlling of slow-changing variables and thus not easily amenable to a causal explanation of the phenomenon analyzed. Therefore, in a second step we extend our examination to account for these potential sources of bias. We estimate the causal impact of

volunteering on subjective well-being via “propensity score matching”, an estimation technique that pays particular attention to the problem of self-selection and off-support inference (Rubin, 1974; Imbens, 2004; Caliendo and Kopeinig, 2008). Propensity score matching is an econometric technique that one can best understand as similar to an experimental setup in medical research. Two groups of participants are randomly selected, of which one is the control group, while the other is the treatment group, which is subjected to a certain drug or medical treatment. Unlike in such a (natural) experiment, however, propensity score matching can be applied to observational data. Multivariate regression modeling may obscure information on the distribution of covariates in the treatment versus control groups. If there is no substantial overlap in the two covariate distributions, multivariate regression estimates rely heavily on extrapolation, and can therefore be misleading (Imbens, 2004; Ichino et al., 2008, pp. 312-3). Matching estimators are preferable because more care is taken to establish an appropriate control group: for every individual in the treatment group, one tries to find a “perfect twin” (Almus and Czarnitzky, 2003, p. 231) in the control group in terms of the observed covariates. Another advantage of matching methods is that they require no assumptions on functional forms (Hussinger, 2008, p. 730).

One could have doubts about the robustness of the two techniques as they measure average effects. The third part of our analysis thus examines whether or not the focus on the conditional mean of the dependent variable provides a good summary picture of the volunteering-happiness relationship. Both fixed-effects regression and propensity score matching focus on the conditional mean of the subjective well-being variable, i.e. they “average out” any effect that might exist on the extremes of the subjective well-being distribution. In heterogeneous distributions, this might seriously under- or overestimate effects or even fail to identify effects at all (Cade and Noon, 2003). Whether the effect of volunteering on subjective well-being might be dependent on having a very high or low subjective well-being score already is left unanswered by focusing on the mean. An appropriate econometric technique to analyze the full well-being distribution are quantile regressions (Koenker and Bassett, 1978; Koenker and Hallock, 2001; Binder and Coad, 2011), which can give us an answer to the question whether one has to be particularly (un)happy for volunteering to have an effect on subjective well-being.

3.2. Data set and indicator selection

The British Household Panel Survey (BHPS) is a well-known longitudinal survey of private households in Great Britain (BHPS, 2010). Its aim is to track social and economic change in a representative sample of the British population (for the following and more information on the data set, see Taylor et al., 2010, sections A2 & A4). The BHPS started in 1991 as a nationally representative sample of 5,000 households, where adults (aged sixteen and over) were interviewed and tracked over the years. The sample comprises about 15,000 individual interviews.³ The BHPS data contains information on various domains of the respondents' lives, ranging from income to jobs, household consumption, education, health, but also social and political values. Until now, 18 waves of data have been collected.

Table 1 here

For our analysis, we can only use a subset of all waves, as many of our key variables have only been collected in an irregular fashion. This pertains especially to the life satisfaction variable (waves 6 to 18, with a gap in wave 11) and the volunteering variable (waves 6 to 18, but only elicited every two years). In effect, after dropping all observations that did not include the variables we use for the analysis, we are left with 57,191 observations leaving us with a considerably smaller unbalanced panel than the above description of the data set would suggest. While large-scale surveys do not offer a very detailed account of volunteering behavior of individuals (or their personalities for that matter), we think that they nevertheless are an important source of information to elucidate the volunteering-happiness relationship, as individuals reporting on volunteering here are not primed by the survey to connect volunteering to their subjective well-being, and hence are not likely to over-report their subjective well-being accordingly (the anonymous design and the large field of questions thus makes it much less likely that the answers suffer from common-method variance or are biased by

³ It is provided by the ESRC UK Longitudinal Studies Centre with the Institute for Social and Economic Research at the University of Essex, UK.

individuals' lay theories about the causal relationships of the variables of interest). The summary statistics for our data set can be found in Table 1.

Our main dependent variable is a life satisfaction question, which records an individual's answer to the question "How dissatisfied or satisfied are you with your life overall?" This is captured ordinally on a seven point Likert scale and ranges from "not satisfied at all" (1) to "completely satisfied" (7; see also Figure 1a). We will later on (implicitly) interpret this well-being measure as cardinal in our OLS regressions. Such an interpretation is common in the psychological literature on well-being, and it has been shown that there are no substantial differences between both approaches in terms of the results they generate (Ferrer-i-Carbonell and Frijters, 2004). We also will use a "mental well-being" variable as a robustness check in our estimations, for which we have chosen the GHQ-12 well-being variable. It is an index from the "General Health Questionnaire" of the BHPS, composed of the answers to 12 questions that assess happiness, mental distress (such as existence of depression or anguish), and well-being. This subjective assessment is measured on a Likert scale from 0 to 36, which we have recoded so that high values denote high mental well-being. The GHQ-12 measure of mental well-being is a remarkably valid instrument that is widely used in the medical literature. Validity and reliability have been established for many different contexts, languages and so on (see, e.g., Goldberg et al., 1997; Gardner and Oswald, 2007, and the references therein).

Figure 1a,b here

Our main explanatory variable is an individual's voluntary work frequency. This is elicited from wave 6 onwards every second year and measured on an ordinal scale as the response to the question: "We are interested in the things people do in their leisure time, ... tell me how frequently you do each one... Do unpaid voluntary work". Individuals can respond to this question in five categories, ranging from "Never/almost

never” (1) to “At least once a week” (5), with middle categories being “Once a year or less” (2) “Several times a year” (3) and “At least once a month” (4).⁴

The effect of volunteering on life satisfaction can be seen in Figure 1b, where mean life satisfaction in our sample is plotted according to the five different volunteering categories (from “Never/almost never” (1) to “At least once a week” (5)). In Figure 2, we plot the different volunteering categories over the different years. Between 7 and 8 out of ten individuals during our sample horizon (in any given year) do not contribute to volunteering work at all. Of our sample of 57,191 observations, 3,935 (6.88%) volunteer at least weekly, 2,703 (4.73%) at least monthly, 2,907 (5.08%) several times a year, 3,036 (5.31%) once a year or less and 44,610 (78%) volunteer never.

Figure 2 here

A second variable of interest is the opinion of an individual, whether other people can be trusted in general. An individual's assessment of the trustworthiness of others is usually well represented by the individual's personality trait “Agreeableness”.⁵ In the BHPS wave 2005, the “Big Five” personality traits were elicited via fifteen short descriptions with which respondents can agree to varying degrees. Sample descriptions include “I see myself as someone who is sometimes rude to others” (referring to Agreeableness)⁶, “I see myself as someone who is outgoing, sociable” (Extraversion) or “I see myself as

⁴ We have recoded the variable so that higher values denoted higher voluntary work frequency, but for our main analysis, we use dummies for the different categories (or combinations thereof).

⁵ A trust question has independently been asked in the BHPS (in very few waves) with the question “Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people?”. Individuals could answer here that “Most people can be trusted” or that one “Can't be too careful” or “Other/depends”. During our sample horizon, we have only 48,459 observations (person-years) with a valid answer to this question. We have created a trust dummy that captures the first answer (18,703 observations, or 38.60%) and lumped the two other answers together as the control condition (29,756 observations, or 61.40%). Unfortunately, the trust question does not heavily overlap with the volunteering question as only 14,026 person-year observations specify a valid answer to both questions. This effectively reduces the value of this variable and makes any results pertaining to it quite unreliable. In the following, we will only use this question as a robustness check on our main results.

⁶ The other two Agreeableness questions are “I see myself as someone who is considerate and kind to almost everyone” and “I see myself as someone who has a forgiving nature”. Arguably, Agreeableness is a good proxy for trust and the ascribed trustworthiness of others on an individual level. It would probably be less apt to measure social capital.

someone who worries a lot" (Neuroticism).⁷ Three questions supposedly capture each of the five traits (each is answered on a 7-point Likert scale from "Does not apply" to "Applies perfectly"). The typical inventories in psychological questionnaires use much larger inventories with 44 or more questions (e.g. the "Big Five Inventory", BFI, John et al., 1991), which have been established to robustly capture the Big Five personality traits over different cultural and inter-temporal contexts (Benet-Martinez and John, 1998; McCrae and Costa, 1997). Empirically, a standard measure to judge the internal consistency of the scale and the items used to measure it is Cronbach's alpha. Big Five inventories here usually reach the threshold value of 0.7 that denotes satisfactory consistency and scale reliability. This is not the case for shorter versions (Gosling et al., 2003; Donnellan and Lucas, 2008), and our calculations show indeed that $\alpha < 0.70$ for our traits as measured by the short inventory (Openness: $\alpha = 0.6745$, Conscientiousness: $\alpha = 0.5070$, Extraversion: $\alpha = 0.5581$, Agreeableness: $\alpha = 0.5268$, Neuroticism: $\alpha = 0.6827$). These measures can nevertheless provide a reasonably valid approximation of the personality traits. Shorter inventories were used and analyzed in several studies and have proven to be reliable despite lower alphas (Gosling et al., 2003): an analysis of a similar short inventory in terms of a different measure of goodness of fit and a comparison between the short and long version for the German Socio-Economic Panel data set (SOEP) proved to be satisfactory despite similarly low alphas as in the our (BHPS) case (Gerlitz and Schupp, 2005).⁸

Figure 3 here

In Table 1 we present means and standard deviations for the Big Five, which are in the range of 10.94 (Neuroticism) to 16.35 (Agreeableness). The variables were coded by adding up the ordinal responses to the three questions relating to each personality trait.⁹ As the personality distributions are quite skewed in some cases (especially for

⁷ A full list is provided, e.g., by Clark and Georgellis (2010).

⁸ This points to a problem with the construction of Cronbach's alpha, which is such that higher numbers of items by necessity imply higher alphas, even if the internal consistency of the inventory would not be increased by adding these additional items (Cortina, 1993).

⁹ Some questions had to be reverse-coded, as they negatively measure the trait. It is still an open question whether one would best add up these components or use averages (Heineck, 2011).

Agreeableness and Conscientiousness), we have decided to interpret the highest quartile as an expression of a high personality trait and the lowest quartile as an expression of a low personality trait, leading to somewhat more even groups for the analysis. Since we are interested in comparing the extreme ends of the personality trait distributions, we think this choice is appropriate. Figure 3 shows a comparison of mean life satisfaction for high versus low personality traits. All differences of means are highly significant (Levene's test for unequal variances of the pairs was conducted in each case, prompting to use t-tests with unequal variances for this exercise).

We have discussed in Section 2 that there is some controversy about the stability of the Big Five personality traits in adults. While the high level of abstraction and great degree of heritability gives a plausible case that personality is quite stable over the short run, it has become disputed that these traits are completely invariant. Some evidence points to the fact that personality is subject to change also if one is over thirty years (*pace* Costa and McCrae, 1994). This is not altogether implausible if one considers how important or scarring life events can alter the trajectories of human (well-) being (Srivastava et al., 2003). What also seems clear is that stability of personality traits is increasing in age: test-retest reliability in childhood ranges between 0.22-0.53 and increases to 0.70-0.79 for adults (Hampson and Goldberg, 2006; Roberts et al., 2006; Roberts and DelVecchio, 2000). Since the Big Five were only asked in the BHPS once so far, we are forced to assume personality traits to be fixed in the individuals over the course of our sample horizon.

We use a number of controls. The first is the *logarithm* of the annual household income (in British Pound Sterling) measure as a regressor in our analysis (Stevenson and Wolfers, 2008; Easterlin, 2001, p. 468), assuming that a given change in the proportion of income leads to the same proportional change in well-being. This assumption of a decreasing marginal utility of income has been found to be similar in a wide range of countries and seems to be a reasonable approximation (Layard et al., 2008).

To account for health problems, an individual's self-reported subjective health status is used. In the BHPS, an individual's subjective assessment of health (during the last 12 months) is ordinally scaled on a five point Likert scale, ranging from "excellent" (five) to

“very poor” (one).¹⁰ We also include (a less subjective) dummy for being disabled in our regressions to account for more severe health conditions.

An individual's social relations are approximated by two questions regarding the amount of contact to family, friends and neighbors. These are ordinally scaled variables regarding the “frequency of talking to neighbours” and the “frequency of meeting people” (0 to 5, ranging from “never” to “on most days”).

Figure 4 here

Other control variables (see Table 1) comprise gender, age, and age² (we use the squared difference between age and mean-age instead of age² to avoid problems of multicollinearity) as well as the number of hours worked in one's job, employment dummies (being unemployed, self-employed, retired, long-term sick, on maternity leave, studying or being in school, caring for family members as well as other conditions not captured). The reference group here is being in employment. We have also marital status dummies (e.g., cohabiting, being married, being separated, divorced or widowed). We control for regions (Metropolitan counties and Inner and Outer London areas, which we do not report, however). Of our sample, 54.81% were female (the gender variable is one if female, zero if male). Figure 4 depicts the different volunteering categories by gender. The mean age is 46.14 years (s.d. 17.13) with maximum age at 99 years and minimum age at 15 (younger individuals were not interviewed in the BHPS). We have also included a variable for the number of children and an educational control variable, as measured by the CASMIN scale (for an individual's highest educational level). This ranges from one (“none”) to nine (“higher tertiary”). In the Appendix we report pairwise correlations between the variables of interest (Table 4). The correlations of most of our indicators are highly statistically significant and we can find no problems of multicollinearity.

¹⁰ We have reversed the numerical order of the Likert scale to consistently use higher values for better health.

3.3. Results and discussion

Our main results are presented in Table 2, where we give some preliminary regressions, Table 5, in the Appendix where we repeat this analysis for the different personality traits, as well as Tables 3 (matching estimates) and 6 (quantile regressions, in the Appendix). Column (1) in Table 2 treats our data as one big pooled cross-section. We offer this as a coarse orientation but would be careful in putting too much stock in these estimates, as individual (unobserved) heterogeneity is not accounted for. The following two columns (models (2) and (3)) repeat the analysis within a fixed-effects (FE) regression framework, controlling for time-invariant individual-specific components (standard errors are clustered on the individual). Accounting for fixed effects in happiness regressions does substantively alter regression results (Ferrer-i-Carbonell and Frijters, 2004), and since happiness is partly determined by genes and stable personality traits (Lykken and Tellgen, 1996; Diener et al., 1999), accounting for fixed effects is the preferable model choice. Model (2) here depicts the FE-version of model (1) and model (3) is a robustness test where we use mental well-being as the dependent variable. We can observe that some of the associations for the cross-section disappear when controlling for individual-specific time-invariant effects in our regressions (education, the number of children). For our volunteering variable, we see (column 2 and 3) significant effects in the volunteering weekly category (for mental well-being, there is also a significant effect of volunteering a few times a year); this is in line with hypothesis 1. The effect size of 0.08 is larger than the effect size found for a German sample (Meier and Stutzer, 2008). It is sizeable when considering that this is one-fifth of the loss in subjective well-being associated with unemployment and more than twice the effect size of our social variables. While Meier and Stutzer (2008) also found positive associations between less than weekly volunteering and subjective well-being in a pooled model, we cannot corroborate these results (our results are similar, however, insofar that in the FE models only weekly volunteering is significantly related to subjective well-being). We have gone beyond the analysis of Meier and Stutzer (2008) with our following analyses:¹¹

¹¹ The positive effects mentioned above disappear when including the trust variable discussed above (a first test of hypothesis 2). Before concluding that controlling for trust (as a measure of social capital) shows that volunteering in itself has no effect on subjective well-being, we should like to point out, again, the massive decrease in sample size the inclusion of the trust variable brings with it. This definitely warrants further empirical attention. The other coefficients of the FE regressions are comparable to what

Table 2 here

We have run the same regressions for subgroups grouped according to personality characteristics (results are given in Table 5 in the Appendix).¹² We find some interesting differences on the opposite ends of the trait distributions. For sake of space, we only highlight a few of these differences relating to volunteering behavior. While coefficient sizes for weekly volunteering are roughly similar (and significant) for individuals with low Extraversion and low Neuroticism, highly Extravert people seem not to benefit in their subjective well-being from volunteering. The second finding of note pertains to highly Conscientious and Agreeable individuals. Both exhibit coefficients nearly twice the size for weekly volunteering than the general sample. Independent of whether personality traits lead to self-selection with regard to volunteering, they definitely mediate the effect volunteering has on individuals' subjective well-being.

FE models are preferable to simple pooled models for panel data, but they may “overcontrol” and hence remove slow-changing variables of interest. This is a problem in our context for individuals who consistently volunteer, i.e. these individuals who can be conjectured to gain the most in terms of subjective well-being, as this effect is not reflected in the FE estimates (this explains why the coefficient decreases when going from a pooled model to the FE model). They also suffer from the above-mentioned drawbacks so that in order to come to more reliable estimates of the causal impact of volunteering on life satisfaction, we turn now to our matching estimates. We focus our attention on individuals that are similar, along a number of dimensions, at time t . We then track these individuals over time and observe differences between the treatment group (those experiencing a *change* from no volunteering to volunteering at least monthly, including all that volunteer weekly) and the control group (their matched

is usually found in the literature, with the exception perhaps of the negative income coefficient. This finding might be explained with reference to the gross annual income measure not being equalized and hence giving a somewhat biased measure of the income an individual has at its command.

¹² Note that sample sizes decreased markedly for the subgroup analyses. This leads to problems with the overall goodness of fit for some of the trait extremes. In the cases of high Neuroticism, low Conscientiousness as well as both Openness extremes, we could not reject the joint significance hypothesis for the coefficients, so that we refrain from discussing these extremes. The reader should treat the according model columns with caution if interpreting results from these trait extremes.

counterparts who do not volunteer). Due to the elicitation of volunteering being biannual, our lag structure for this exercise is two years, i.e. we match individuals at $t=0$ and then see whether they started volunteering from $t=0$ to $t=2$ and what the impact is on their life satisfaction in $t=2$. For the second lag, we then estimate the impact on life satisfaction in $t=4$ for these who also continue to volunteer from $t=2$ to $t=4$.

We apply two different types of matching, viz. multidimensional nearest-neighbor matching as well as propensity score matching. Nearest neighbor matching finds a match in many dimensions simultaneously while propensity score matching collapses all covariates into one composite variable (the so-called “propensity score”). With nearest neighbor matching, we matched individuals according to a smaller number of criteria, namely: hours worked per week, $\log(\text{income})$, gender, age, number of children, education, subjective health status, personality trait scores, dummies for being disabled, being married or cohabiting, as well as for being unemployed or self-employed. Adding more criteria would have made it harder to get good matches (the “curse of dimensionality”).

With propensity score matching, covariates are collapsed into a synthetic propensity score, and matching is performed with reference to the propensity score only. Therefore higher numbers of covariates can be used, and we matched individuals additionally according to the following list of covariates: year dummies, regional dummies for the different former Metropolitan counties and Inner and Outer London, dummies for being separated, divorced or widowed, a dummy being retired, still studying or in school, being long-term sick, on maternity leave or for family care and a quadratic age term. We also included the social variables (meeting with neighbours and speaking with friends).

The results are presented in Table 3.¹³ The causal impact of starting to volunteer monthly or weekly on subjective well-being is 0.0947 in $t+2$ for propensity score

¹³ We have also carried out several sensitivity checks, which we only report summarily here. These tests range from visual inspection of the kernel density plots of starting to volunteer versus not volunteering to more formal calculations regarding the reduction of bias achieved through matching (Caliendo and Kopeinig, 2008). Both tests aim at verifying whether covariate overlap after matching treatment and control group is obtained. In sum, we have achieved bias reductions that are in the vicinity of the maximum bias of 10%-threshold demanded in the literature (see D’Agostino, 1998) for most covariates. Exceptions to this are the education and age variables, most prominently, where matching was difficult, i.e.

matching (nearest-neighbor matching: 0.0647 in t+2) and it increases for those who continue to volunteer to 0.1338 in t+4 (nearest-neighbor matching: 0.1538 in t+4). Volunteering regularly thus has a positive and sustained impact on individual well-being that does not seem to be subject to hedonic adaptation. On the contrary, the sustained volunteering effort seems to be subject to increasing returns in terms of happiness. This finding is consistent with the idea that it takes some time till volunteers can realize the full benefits of volunteering for subjective well-being. Since we are holding volunteering constant after having changed into the treatment condition, it is not necessarily a confirmation for the hypothesis that there is a mutually reinforcing virtuous circle where volunteers get happier and thus volunteer more and so on.

Table 3 here

The final set of results now aims to elucidate whether the impact of volunteering on subjective well-being is different along the quantiles of the subjective well-being distribution. Different influences on subjective well-being have been found to be associated differently with subjective well-being in the literature (Binder and Coad, 2011): income, for example, is not related to happiness in the higher quantiles, while social relations are related with happiness in higher quantiles of the distribution (in both cases, the variables are even more strongly related to subjective well-being at the lower extremes of the distribution). In the case of education, the direction of association even changes sign (education is positively associated with well-being for low well-being levels and negatively for high levels of well-being). In our quantile regressions, we aim at analyzing this relationship for volunteering. Since there is still no consensus of how to apply quantile regression to the panel context, we have carried out this analysis for the 18th wave of our sample.¹⁴

it was difficult to find good twins in terms of age and education from both treatment and control group. The authors provide these regression diagnostics on request.

¹⁴ We have repeated the analysis for the other waves and found largely similar associations in the different years.

The results are depicted in Table 6 in the Appendix. We here find a differentiated relationship between volunteering and subjective well-being over the different quantiles (we report the 10, 25, 50, 75 and 90 percent quantiles). For mental well-being there are no associations, independent of whether we use volunteering dummies or the ordinally scaled volunteering variable (columns (3) and (4)).¹⁵ For life satisfaction, we find an association, however, this association is not sustained for the upper quantiles (no association in the 75 and 90 percent quantile). Although the cross-sectional nature of the quantile regression analysis makes a causal interpretation impossible, a speculative explanation could be that volunteering has a “defensive” effect for an individual: if one is already happy, volunteering does not add anything, however, if one is unhappy, volunteering has a beneficial effect on one's unhappiness. This would corroborate an argument that volunteering can be used to offset the negative impact of other life conditions, such as being retired and lonely, or being unemployed (Li et al., 2005; Helliwell and Putnam, 2004). Further research here could shed more light on this hypothesis. In this regard, it is also noteworthy that in contrast to volunteering, the Big Five personality traits are generally also (significantly) related to subjective well-being in the higher quantiles. This stresses their importance for subjective well-being (irrespective of the level of well-being already obtained). While volunteering thus may contribute to the well-being of unhappy individuals, being an Agreeable person seems to influence one's happiness irrespective of one's position in the subjective well-being distribution.¹⁶

We have repeated our analysis for the broader mental well-being variable and found largely comparable results in terms of intertemporal development of mental well-being of volunteers in our matching estimates. Using an equivalized measure of household income also does not substantially alter results.

¹⁵ Note that we use the same specification for the quantile regressions as for the other regressions in this paper, however, we only report the coefficients for volunteering and the five personality traits in our Table.

¹⁶ We have also run a model for the 10th wave of the BHPS (not reported here for reasons of space), where we had information on trust and volunteering and thus could add both into our regressions. It is actually quite similar to model (1). This corroborates our conjecture that controlling for social capital does not lead to insignificant coefficients for volunteering. Due to the thin data basis, we would, however, suggest this be the subject of more detailed research.

4. Implications for public policy

The analysis has a variety of implications for public policy-making. It is possible to broadly distinguish two lines of thought of “happiness politics” that can be roughly compared to the approach of welfare economics, on the hand, versus the approach of constitutional economics, on the other hand (Schubert, 2011; Duncan, 2010). The proponents of the former approach seem to adhere to a happiness social welfare function that a policy-maker should maximize by taking appropriate policy interventions (e.g., Veenhoven, 2010). The latter approach refrains from this maximization endeavor in favor to providing a suitable institutional environment in which individuals can sovereignly pursue their own ideas of happiness (e.g., Frey and Stutzer, 2010). The maximization paradigm has been criticized on several counts: first, happiness research is a still young research field with many unsolved issues, such as how to normatively account for hedonic adaptation in such a happiness welfare function (e.g., Graham, 2009, Ch. 8). As many findings of happiness research are provisional, a maximization paradigm with the policy-maker as the engineer of individuals' happiness seems on shaky foundations regarding our knowledge about causal relationships in this field. Also, it is unclear how to deal with a wide range of operational issues of such policies: on the level of the individuals, concerns of misrepresentation of individual well-being have been voiced and on the level of policy-makers the incentives to manipulate individuals' attitudes (i.e. judgements of happiness) instead of objective prevailing conditions (Frey and Stutzer, 2010). In addition, happiness maximization may well be subject to political abuse – powerful interest groups or political parties might be able to define other individuals' happiness and impose their will on the society; of course for the sake of society's increased happiness.¹⁷ Considering that self-determination is an important source for individual subjective well-being (Deci and Ryan, 2000), direct coercive interventions (mandatory happiness-increasing behaviors) might actually turn out to be decreasing happiness through their enforcement. Something that increases one's happiness if done voluntarily might be detrimental to one's happiness if being mandated (note that this crowding out is of a different sort than the crowding out hypothesis discussed in the literature on charitable giving, see, e.g., Konow, 2010). From the point of view of these critiques, the constitutional (or “institutional”) approach to

¹⁷ The reader may think of a “Brave new world” (Huxley, 2007[1932]) in the name of collective happiness.

happiness politics seems to be a preferable (prudent) choice – if only at this moment in time.

What implications have our findings then for an indirect, “institutional approach” to happiness politics? Is it possible to pursue happiness-conducive institutional setups (which could be summed up under the heading of “instituted volunteering”)? Would this even create a double dividend, leaving happy volunteers and saving public money and/or increasing the scope for social activities against the background of increasingly indebted industrialized economies with an ageing population?

Our evidence suggests that this may be the case, but also reveals some caveats: knowing that voluntary work sustainably increases individual well-being over time, it seems reasonable to suggest an increased focus of social and economic policy in providing opportunities for voluntary contributions of the citizens. Considering the evidence discussed above on the importance of self-determination and empirical findings that (involuntary) care-giving within the family are detrimental to the mental well-being and happiness of the care-giver (Hirst, 2005), this does not mean to increase the private (within-family) provision of care for the elderly and sick, but rather creating volunteering opportunities that can be pursued voluntarily and autonomously.¹⁸ Many kinds of jobs in the public service may be offered on the basis of voluntary work – especially for elderly citizens who are often no longer part of the work force. *Pro bono* work in libraries or civil (public) service institutions come to mind as an example.

These types of volunteering opportunities could be further conjectured to be taken up by individuals who want to compensate for disadvantages in their lives, as a coping strategy in effect. While this may not increase the happiness of the happiest (see our findings above), it stands to decrease the unhappiness of the depressed and it can be a measure to keep individuals from becoming unhappy.

A different type of volunteering that could be promoted and publicly subsidized (or subject to tax-breaks or other incentives) is social entrepreneurship (Glaeser and

¹⁸ To what extent coerced charity does not come with the warm glow of happiness should receive more research attention. Harbaugh et al. (2007) find that even mandatory charitable giving through taxation seems to activate individuals' reward areas in the brain, albeit not as strongly as voluntary giving.

Shleifer, 2001). Considering the substantial positive impact, self-employment has for those that want to pursue their own ideas or opportunities (Binder and Coad, 2010b), it can be expected that this effect can even be compounded for the entrepreneurs who use their entrepreneurial skills for altruistic motives. Fostering a culture of social entrepreneurship would thus sustainably benefit the recipient as well as the donor.

Finally, the creation of more sustained opportunities for voluntary work may be accompanied by widespread informational (educational) campaigns on the benefits of voluntary work for the volunteers. As Liu and Aaker (2008) argue, it is plausible that individuals already have “lay theories” about the altruism-happiness relationship. It turns out these lay theories on the benefits of helping are well-founded empirically but if this is not well-known or salient for individuals, “underhelping” (Liu and Aaker, 2008, p. 553) might take place. For this matter, advertisement campaigns, awards and prizes can be deemed suitable instruments of public policy.¹⁹

But even if the goal of policy is not individuals' happiness but the increase of altruistic behaviour (for its own sake), some implications stand out: happiness research, alongside the experimental evidence in the lab, provides empirical corroboration of the “warm glow” hypothesis of altruism. If altruistic behavior is impure, increased public spending on public goods will not completely crowd out altruistic behavior but will complement it (Brooks, 2000, 2006). Additionally, a policy-maker who wants to increase the rate of altruism within society would (similar to the logic above) advertise the “warm glow” properties of volunteering. Also, since the relationship between altruism and happiness seems to causally run in both ways, other policies (direct or in the form of institutional setups) that lead to a happier society will also lead to a society that behaves more altruistically-inclined. Given that the (welfare) state is increasingly less able to fulfill many of its functions that might be substituted for through voluntary provision, an increased focus on increasing citizen's happiness might be a reasonable policy goal, as well.

Finally, from a dynamic point of view, the “warm glow” property of volunteering presents itself as a learning opportunity for individuals: rewarding experiences (in the

¹⁹ This is consistent with the evidence from experiments that “familiarity” with the cause for donations leads to higher contributions, see Konow (2010).

sense of being pleasurable) trigger learning processes (so-called reinforcement learning) that entrenches behavior. This means that it could make sense to offer initial incentives to stimulate volunteering that can be gradually phased out while the individual learns that voluntary work is pleasurable in itself. Such incentive schemes for volunteering would “lure” non-volunteering individuals into donating some of their time in the reasonable hope of this volunteering being sustainable without external incentives after learning processes have taken place.

Despite these powerful arguments, one has to be careful. The results are very sensitive to the personality of the volunteer. It remains an open question whether public incentives to increase volunteering or even implicit social pressure to do so has negative side-effects on the personalities of the volunteers. Two aspects are relevant here; first, implicit or explicit pressure on volunteers to increase their activity might counteract the expression of their personalities and result in less volunteering and happiness. Second, political pressure to increase volunteering might crowd out altruistic motives for volunteering. The results of our study do not explicitly suggest this backfiring, but it cannot be ruled out. Thus, this is a field for further research.

5. Conclusion

In this paper we have explored the relationship between volunteering (which can be seen as an expression of altruism; but which can to a certain extent also be undertaken for social reasons) and subjective well-being. In our empirical analysis, we have found that for our British sample, regular volunteering significantly increases well-being even when taking into account stable personality traits such as Agreeableness that could potentially confound this relationship. We have given an estimate of the causal effect of volunteering on individuals' well-being and shown that this effect increases over time for individuals who continue their volunteering efforts. However, this effect does not seem to be well captured by typical regression methodologies focusing on the mean effects of the explanatory variables. Expanding our analysis to the full subjective well-being distribution, we find no longer an association between volunteering and subjective well-being for the upper quantiles of the distribution. In other words: volunteering can be conjectured to be protective for the volunteers insofar as it allows

them to mitigate their own unhappiness. Happy individuals, on the other hand, seem to derive their happiness from other sources. We have explored the robustness of our analysis in various ways: similar results are obtained for a broader measure of mental well-being as well as for different measures of income.

These findings are relevant for public policy in several ways. While the relationship between volunteering and happiness is a complex one, our discussion allows some policy implications: due to the tentative evidence in the field of happiness studies, the engineering approach towards a more happy society seems problematic. On the other hand, creating the right institutional setups to allow individuals to pursue their happiness (Frey and Stutzer, 2010; Schubert, 2011) is a more credible outlook on happiness politics. In the case of volunteering, this would imply the creation of opportunities for volunteering in the public sector, informational campaigns about the benefits of volunteering for the volunteer as well as the fostering of social entrepreneurship. To the extent that learning processes entrench volunteering behavior in individuals, helping people to learn to appreciate volunteering seems to be a cost-effective way of promoting such a form of altruistic behavior. Despite this optimistic outlook, it seems necessary to understand the policy-happiness-volunteering link much better.

22.03.2012

Appendix

Table 4,5,6 here

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	(1)			
	mean	sd	min	max
life satisfaction	5.2360	1.2384	1	7
mental well-being	25.7905	5.4502	1	37
d_vol_weekly	0.0688	0.2531	0	1
d_vol_monthly	0.0473	0.2122	0	1
d_vol_yearly	0.0508	0.2197	0	1
d_vol_less	0.0531	0.2242	0	1
d_vol_never	0.7800	0.4142	0	1
Agreeableness	16.3476	2.9704	3	21
Extraversion	13.4169	3.5179	3	21
Neuroticism	10.9365	3.9166	3	21
Openness	13.3223	3.6194	3	21
Conscientiousness	15.9041	3.2056	3	21
d_trust	0.3953	0.4889	0	1
log(income)	9.2330	1.1242	-0.7317	13.487
talk.neighbours	4.0579	0.9769	1	5
meeting people	4.2706	0.7692	1	5
subj. health	3.8374	0.9197	1	5
d_cohabiting	0.6845	0.4647	0	1
d_married	0.5731	0.4946	0	1
d_separated	0.0213	0.1443	0	1
d_widowed	0.0647	0.2460	0	1
d_divorced	0.0875	0.2826	0	1
hrs worked	22.0397	19.1939	0	99
d_employed	0.5533	0.4972	0	1
d_unemployed	0.0270	0.1622	0	1
d_selfemployed	0.0720	0.2584	0	1
d_retired	0.1966	0.3974	0	1
d_studyschool	0.0323	0.1767	0	1
d_maternityleave	0.0053	0.0728	0	1
d_longtermsick	0.0410	0.1983	0	1
d_familycare	0.0664	0.2491	0	1
d_other	0.0061	0.0778	0	1
d_disabled	0.0835	0.2766	0	1
gender	0.5481	0.4977	0	1
age	46.1385	17.1278	15	99
(age-mean age) ²	293.3675	333.9226	0.001197	2805.3
education	5.1118	2.8706	1	9
number of children	0.6139	0.9713	0	7
Observations	57191			

Table 1: Summary statistics.

	(1)		(2)		(3)		(4)		(5)	
	life sat. (pooled)		life sat. (FE)		mental wb (FE)		life sat. (FE, trust)		mental wb (FE, trust)	
d.vol_weekly	0.1286***	(5.67)	0.0756***	(3.65)	0.4447***	(4.31)	0.0353	(0.60)	0.5994	(1.91)
d.vol_monthly	0.0422	(1.84)	0.0343	(1.68)	0.2458*	(2.43)	0.0004	(0.01)	0.2983	(0.91)
d.vol_yearly	0.0346	(1.65)	0.0346	(1.81)	0.2704**	(2.66)	-0.0596	(-1.12)	-0.2773	(-1.00)
d.vol_less	-0.0393*	(-2.02)	-0.0115	(-0.68)	0.0263	(0.29)	0.0089	(0.17)	-0.0337	(-0.13)
hrs worked	-0.0007	(-1.13)	0.0001	(0.13)	0.0025	(0.89)	0.0008	(0.50)	0.0032	(0.37)
log(income)	-0.0162**	(-2.64)	-0.0145*	(-2.51)	-0.0687*	(-2.37)	-0.0101	(-0.50)	-0.0534	(-0.50)
age	0.0028***	(3.75)	-0.0397*	(-2.23)	-0.0898	(-1.24)	0.0798	(1.20)	0.2327	(0.74)
(age-mean age) ²	0.0004***	(12.03)	0.0000	(1.03)	0.0006**	(2.89)	-0.0001	(-0.42)	0.0015	(1.25)
number of children	-0.0687***	(-9.26)	-0.0144	(-1.57)	0.0575	(1.27)	-0.0252	(-0.75)	-0.1824	(-0.99)
education	-0.0179***	(-6.36)	0.0101	(0.92)	0.0853	(1.46)	0.0499	(1.18)	0.2263	(1.07)
subj. health	0.3993***	(53.94)	0.2137***	(28.30)	1.4040***	(35.59)	0.1841***	(9.29)	1.2764***	(12.01)
d.disabled	-0.1907***	(-6.79)	-0.1701***	(-5.76)	-0.5794***	(-4.71)	-0.1657	(-1.27)	-0.3799	(-0.62)
talk.neighbours	0.0774***	(12.20)	0.0287***	(4.45)	0.1196***	(4.00)	0.0201	(1.11)	0.2770**	(3.02)
meeting people	0.0752***	(9.86)	0.0306***	(4.41)	0.0601	(1.75)	0.0367	(1.79)	0.0117	(0.11)
d.cohabiting	0.3376***	(15.91)	0.2493***	(9.60)	0.5487***	(4.17)	0.2370**	(3.08)	0.7468	(1.85)
d.married	0.0319	(1.33)	-0.0107	(-0.39)	-0.4191**	(-2.87)	0.2262*	(2.27)	0.3296	(0.60)
d.separated	-0.1763***	(-4.26)	0.0070	(0.14)	-1.1111***	(-3.83)	0.3223	(1.80)	-1.5759	(-1.46)
d.divorced	-0.0350	(-1.15)	0.1203**	(2.76)	0.2746	(1.24)	0.3809*	(2.33)	0.7993	(0.88)
d.widowed	0.0049	(0.12)	-0.0682	(-1.10)	-1.1511***	(-4.07)	0.3150	(1.23)	-0.7447	(-0.67)
d.unemployed	-0.3830***	(-9.37)	-0.3741***	(-9.07)	-2.0488***	(-9.79)	-0.4002***	(-3.50)	-2.4768***	(-4.00)
d.selfemployed	0.0278	(1.18)	-0.0497	(-1.81)	-0.2582*	(-2.02)	-0.0108	(-0.13)	-0.2252	(-0.52)
d.retired	0.1557***	(4.74)	0.0049	(0.16)	0.0340	(0.24)	-0.0361	(-0.39)	0.5645	(1.30)
d.studyschool	0.0817*	(2.32)	0.0869*	(2.24)	-0.0434	(-0.21)	0.0503	(0.40)	0.0457	(0.07)
d.maternityleave	0.3490***	(5.71)	0.2759***	(5.53)	-0.2687	(-0.98)	0.3883**	(2.83)	0.8821	(0.94)
d.longtermsick	-0.2287***	(-5.27)	-0.3859***	(-8.10)	-1.9683***	(-8.44)	-0.2019	(-1.15)	-0.2926	(-0.31)
d.familycare	-0.0763*	(-2.37)	-0.0697*	(-2.19)	-0.6507***	(-4.18)	0.0625	(0.70)	-0.2374	(-0.57)
d.other	-0.1216	(-1.78)	-0.0127	(-0.19)	-0.1607	(-0.46)	0.0814	(0.48)	-0.3231	(-0.44)
gender	0.0194	(1.26)								
d.trust							0.0603	(1.92)	0.3380*	(2.13)
Constant			5.8847***	(8.04)	23.1923***	(7.61)	-0.1772	(-0.06)	5.9063	(0.42)
Observations	57191		57191		57191		13945		13945	
(Pseudo-)R ²	0.065		0.047		0.066		0.062		0.062	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Regression results. Standard errors clustered on the individual.

Propensity Score Matching (Never to Volunteering vs. Never to Never)		
		obs. (treated)
lag t+2	.0947**	30,505 (1,628)
SE	.0307	
t-stat	3.08	
lag t+4	.1338**	17,869 (350)
SE	.0648	
t-stat	2.06	
Nearest Neighbor Matching (Never to Volunteering vs. Never to Never)		
		obs.
lag t+2 lag	.0647*	30,522
SE	.0358	
z-stat	1.81	
lags t+4	.1538**	18,247
SE	.0776	
z-stat	1.98	

Table 3: Nearest neighbor matching estimates of the Sample Average Treatment Effect (SATE). 4 matches are selected for each treatment observation. SATE, Standard Errors and z-stats estimated following Abadie et al., (2004). For propensity score matching, Average Treatment effects for the Treated (ATTs) given, with t-statistics in parentheses, following Leuven and Sianesi (2003). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

	life_satisfaction	mental_well-being	d_vol_weekly	d_vol_monthly	d_vol_yearly	d_vol_less	d_vol_never	log(income)	subj_health	d_unemployed	d_employed	education
life_satisfaction	1.0000											
mental_well-being	0.5689*** (0.0000)	1.0000										
d_vol_weekly	0.0478*** (0.0000)	0.0319*** (0.0000)	1.0000									
d_vol_monthly	0.0286*** (0.0000)	0.0153*** (0.0002)	-0.0605*** (0.0000)	1.0000								
d_vol_yearly	0.0158*** (0.0002)	0.0108*** (0.0098)	-0.0629*** (0.0000)	-0.0515*** (0.0000)	1.0000							
d_vol_less	-0.0012 (0.7812)	0.0140*** (0.0008)	-0.0644*** (0.0000)	-0.0527*** (0.0000)	-0.0548*** (0.0000)	1.0000						
d_vol_never	-0.0515*** (0.0000)	-0.0405*** (0.0000)	-0.5119*** (0.0000)	-0.4194*** (0.0000)	-0.4358*** (0.0000)	-0.4459*** (0.0000)	1.0000					
log(income)	-0.0114*** (0.0062)	0.0372*** (0.0000)	-0.0279*** (0.0000)	0.0094*** (0.0242)	0.0099* (0.0182)	0.0179*** (0.0000)	-0.0027 (0.5168)	1.0000				
subj_health	0.3418*** (0.0000)	0.3785*** (0.0000)	0.0168*** (0.0001)	0.0217*** (0.0000)	0.0261*** (0.0000)	0.0419*** (0.0000)	-0.0579*** (0.0000)	0.0878*** (0.0000)	1.0000			
d_unemployed	-0.0897*** (0.0000)	-0.0615*** (0.0000)	-0.0112*** (0.0072)	-0.0183*** (0.0000)	-0.0116*** (0.0056)	-0.0034 (0.4162)	0.0242*** (0.0000)	-0.0993*** (0.0000)	-0.0346*** (0.0000)	1.0000		
d_employed	0.0091* (0.0293)	0.0885*** (0.0000)	-0.0816*** (0.0000)	-0.0394*** (0.0000)	-0.0079 (0.0585)	0.0385*** (0.0000)	0.0534*** (0.0000)	0.3775*** (0.0000)	0.2120*** (0.0000)	-0.1855*** (0.0000)	1.0000	
education	0.0033 (0.4282)	0.0683*** (0.0000)	0.0638*** (0.0000)	0.0722*** (0.0000)	0.0939*** (0.0000)	0.0889*** (0.0000)	-0.1739*** (0.0000)	0.2519*** (0.0000)	0.1939*** (0.0000)	-0.0522*** (0.0000)	0.2399*** (0.0000)	1.0000
age	0.0864*** (0.0000)	-0.0223*** (0.0000)	0.0865*** (0.0000)	0.0804*** (0.0000)	0.0097* (0.0206)	-0.0662*** (0.0000)	-0.0633*** (0.0000)	0.0495*** (0.0000)	-0.1545*** (0.0000)	-0.0933*** (0.0000)	-0.3972*** (0.0000)	-0.2322*** (0.0000)
gender	-0.0113** (0.0070)	-0.1289*** (0.0000)	0.0419*** (0.0000)	0.0131** (0.0017)	0.0070 (0.0958)	-0.0119** (0.0043)	-0.0296*** (0.0000)	-0.2387*** (0.0000)	-0.0568*** (0.0000)	-0.0358*** (0.0000)	-0.0565*** (0.0000)	-0.0576*** (0.0000)
Observations	57191											

P-values in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Contemporaneous Correlations.

	E: high	E: low	N: high	N: low	C: high	C: low	A: high	A: low	O: high	O: low
d.vol.weekly	0.0879 (1.85)	0.0780* (2.18)	0.0853 (1.91)	0.0705* (2.01)	0.1225* (2.39)	0.0268 (0.58)	0.1383*** (3.07)	0.0538 (1.30)	0.0644 (1.49)	0.0934* (2.51)
d.vol.monthly	0.0526 (1.29)	0.0091 (0.22)	0.0227 (0.45)	0.0418 (1.32)	0.0522 (0.94)	0.0231 (0.51)	0.0680 (1.62)	-0.0233 (-0.52)	0.0762 (1.80)	0.0012 (0.03)
d.vol.yearly	0.0317 (0.76)	0.0190 (0.46)	0.0414 (0.86)	0.0546 (1.17)	0.0471 (0.89)	-0.0069 (-0.16)	0.0941* (2.34)	-0.0216 (-0.50)	0.0342 (0.88)	0.0320 (0.90)
d.vol.less	0.0023 (0.06)	-0.0324 (-1.03)	0.0033 (0.08)	-0.0226 (-0.75)	0.1028 (1.84)	-0.0307 (-0.87)	0.0157 (0.41)	-0.0582 (-1.54)	0.0404 (1.15)	-0.0501 (-1.54)
hrs worked	-0.0012 (-0.95)	0.0008 (0.69)	0.0003 (0.23)	0.0005 (0.48)	0.0008 (0.40)	-0.0005 (-0.42)	0.0004 (0.32)	-0.0007 (-0.57)	-0.0013 (-0.98)	-0.0004 (-0.34)
log(income)	-0.0232* (-2.17)	-0.0041 (-0.32)	0.0116 (0.88)	-0.0112 (-1.17)	-0.0518** (-3.03)	-0.0044 (-0.39)	-0.0028 (-0.25)	-0.0219 (-1.76)	-0.0162 (-1.36)	-0.0224* (-2.06)
age	-0.0024 (-0.07)	-0.0298 (-0.99)	-0.0861** (-2.64)	-0.0093 (-0.32)	0.0061 (0.14)	-0.0464 (-1.55)	-0.0156 (-0.48)	-0.0250 (-0.57)	0.0313 (0.88)	-0.0712* (-2.23)
age ²	0.0001 (1.02)	-0.0000 (-0.54)	0.0000 (0.22)	0.0000 (0.37)	-0.0003* (-2.10)	0.0001 (0.88)	0.0001 (0.92)	0.0000 (0.18)	-0.0001 (-0.80)	0.0001 (0.73)
no. kids	-0.0269 (-1.36)	0.0040 (0.21)	-0.0080 (-0.38)	-0.0232 (-1.41)	0.0313 (1.19)	-0.0574** (-2.98)	0.0023 (0.11)	-0.0068 (-0.36)	0.0030 (0.16)	-0.0228 (-1.28)
education	0.0005 (0.02)	0.0044 (0.18)	0.0068 (0.28)	0.0097 (0.50)	-0.0274 (-0.91)	0.0136 (0.68)	-0.0022 (-0.10)	0.0020 (0.09)	-0.0436 (-1.69)	0.0109 (0.53)
subj. health	0.1887*** (11.94)	0.2187*** (14.58)	0.2637*** (16.08)	0.1548*** (11.82)	0.2478*** (12.22)	0.1929*** (12.64)	0.2142*** (13.06)	0.1954*** (12.83)	0.2100*** (13.66)	0.2309*** (16.66)
d.disabled	-0.1126 (-1.59)	-0.2926*** (-6.03)	-0.1927** (-3.08)	-0.0993 (-1.94)	-0.1205 (-1.71)	-0.1765** (-3.09)	-0.0613 (-0.82)	-0.1693*** (-3.35)	-0.1406* (-2.32)	-0.1699*** (-3.42)
talk.neighbours	0.0348* (2.45)	0.0095 (0.76)	0.0566*** (4.09)	0.0201 (1.62)	0.0606** (3.15)	0.0168 (1.37)	0.0252 (1.85)	0.0324* (2.56)	0.0402** (2.75)	0.0155 (1.36)
meeting people	0.0475** (2.91)	0.0417*** (3.36)	0.0479** (3.02)	0.0363** (2.95)	-0.0181 (-0.88)	0.0399** (2.89)	0.0214 (1.30)	0.0194 (1.42)	0.0297* (2.14)	0.0360** (2.86)
d.cohabiting	0.2892*** (5.45)	0.3093*** (4.96)	0.3633*** (6.51)	0.1994*** (4.16)	0.3919*** (4.76)	0.1884** (3.27)	0.2195*** (4.03)	0.3022*** (4.84)	0.2705*** (4.75)	0.2469*** (5.00)
d.married	0.0248 (0.44)	-0.0439 (-0.71)	0.0107 (0.18)	-0.0214 (-0.43)	-0.2811** (-2.96)	-0.0251 (-0.46)	0.0370 (0.62)	-0.1149 (-1.83)	-0.1846** (-2.79)	-0.0087 (-0.17)
d.separated	-0.0711 (-0.67)	-0.1456 (-1.36)	0.1668 (1.45)	-0.2187* (-2.51)	-0.0872 (-0.54)	-0.0868 (-0.82)	0.1603 (1.45)	0.1320 (1.18)	-0.2007 (-1.85)	0.0764 (0.82)
d.divorced	0.2171* (2.51)	-0.0263 (-0.28)	0.2567** (2.66)	0.0666 (0.81)	0.0632 (0.48)	-0.0106 (-0.12)	0.2033* (2.05)	0.0037 (0.04)	-0.0378 (-0.41)	0.0884 (1.07)
d.widowed	-0.0607 (-0.40)	-0.1040 (-0.86)	-0.0107 (-0.07)	-0.2195* (-2.02)	-0.2629 (-1.61)	-0.2172 (-1.86)	0.0916 (0.57)	-0.1636 (-1.48)	-0.2615* (-1.97)	-0.0452 (-0.43)
d.unemployed	-0.3955*** (-4.33)	-0.4066*** (-5.31)	-0.4431*** (-5.62)	-0.2718** (-3.28)	-0.2216 (-1.61)	-0.3868*** (-5.01)	-0.4027*** (-4.59)	-0.4033*** (-5.13)	-0.2879** (-3.13)	-0.4825*** (-6.87)
d.selfemployed	-0.0914 (-1.71)	-0.0359 (-0.61)	-0.0639 (-0.87)	-0.0542 (-1.18)	-0.2310** (-2.80)	0.0131 (0.23)	0.0495 (0.90)	0.0514 (0.88)	-0.0967 (-1.75)	-0.0317 (-0.62)
d.retired	-0.0277 (-0.42)	-0.0229 (-0.43)	-0.1028 (-1.38)	0.1151* (2.05)	-0.1176 (-1.40)	0.1337* (2.16)	0.0801 (1.18)	-0.1206* (-2.08)	-0.0649 (-1.02)	-0.0041 (-0.08)
d.studyschool	0.0623 (0.82)	0.0099 (0.12)	0.1046 (1.18)	0.1377* (2.00)	0.1397 (1.08)	0.0484 (0.61)	0.0712 (0.89)	0.0684 (0.77)	-0.1493 (-1.45)	0.1021 (1.63)
d.maternityl.	0.1644* (2.13)	0.6209*** (5.05)	0.3569*** (3.89)	0.1541 (1.42)	0.2826 (1.36)	0.4808*** (3.87)	0.3083** (3.00)	0.1824* (2.00)	0.3722*** (3.88)	0.3017*** (2.69)
d.longtermsick	-0.4701*** (-4.03)	-0.3591*** (-4.57)	-0.4202*** (-4.94)	-0.3144** (-2.99)	-0.3293** (-2.70)	-0.3713*** (-4.04)	-0.1593 (-1.31)	-0.4472*** (-5.79)	-0.3813*** (-3.62)	-0.4423*** (-5.91)
d.familycare	-0.0627 (-0.98)	-0.0724 (-1.20)	-0.0813 (-1.27)	-0.0120 (-0.18)	-0.1447 (-1.86)	-0.0688 (-0.99)	0.0763 (1.08)	-0.1581** (-2.70)	-0.0491 (-0.73)	-0.1263* (-2.23)
d.other	-0.1218 (-0.96)	-0.1449 (-0.94)	0.1822 (1.28)	-0.1029 (-0.75)	-0.0301 (-0.17)	-0.2047 (-1.52)	0.1261 (1.27)	-0.0579 (-0.39)	-0.1925 (-1.10)	-0.1864 (-1.64)
Constant	4.3407*** (3.33)	5.6949*** (3.40)	7.3364*** (4.60)	5.1256** (3.28)	4.9585* (2.43)	6.4283*** (4.17)	4.6514*** (3.70)	6.1340* (2.53)	3.5599 (1.87)	7.6519*** (4.65)
Observations	11307	16937	13739	15199	8353	14619	10965	16749	13210	18631
R ²	0.052	0.055	0.067	0.038	0.065	0.045	0.045	0.046	0.049	0.052

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Subgroup analysis for different personality traits (high trait expression refers to the upper quartile, while low trait expression refers to the lower quartile). E = Extraversion; N = Neuroticism; O = Openness; C = Conscientiousness and A = Agreeableness.

	(1)		(2)		(3)		(4)	
	Life sat.; Vol Dummy		Life sat; Volunt.		Mental; Vol Dummy		Mental; Volunt.	
q10								
d_vol_weekly	0.113	(1.06)			0.241	(0.54)		
d_vol_monthly	0.197*	(2.39)			-0.110	(-0.28)		
d_vol_less	-0.00149	(-0.01)			-0.595	(-0.98)		
d_vol_yearly	0.0565	(0.56)			-0.0378	(-0.07)		
volunteering			0.0395*	(2.04)			0.0126	(0.15)
Extraversion	0.0181**	(2.74)	0.0192**	(2.91)	0.0355	(0.98)	0.0268	(0.69)
Neuroticism	-0.0690***	(-9.82)	-0.0690***	(-9.02)	-0.587***	(-16.62)	-0.584***	(-18.20)
Openness	-0.00574	(-0.86)	-0.00615	(-0.80)	-0.0834*	(-2.07)	-0.0867**	(-2.62)
Agreeableness	0.00993	(1.28)	0.0114	(1.39)	0.0471	(1.09)	0.0386	(0.82)
Conscientiousness	0.0197*	(2.25)	0.0181*	(2.11)	0.00799	(0.17)	0.0123	(0.28)
q25								
d_vol_weekly	0.185*	(2.53)			-0.0314	(-0.13)		
d_vol_monthly	0.0655	(1.20)			0.219	(0.98)		
d_vol_less	0.0388	(0.45)			-0.449	(-1.13)		
d_vol_yearly	0.0502	(0.87)			-0.0837	(-0.31)		
volunteering			0.0350**	(2.60)			0.00665	(0.11)
Extraversion	0.0149**	(3.20)	0.0140**	(2.91)	0.0115	(0.51)	0.0121	(0.61)
Neuroticism	-0.0621***	(-12.76)	-0.0631***	(-13.67)	-0.423***	(-18.65)	-0.422***	(-20.77)
Openness	-0.00389	(-0.67)	-0.00313	(-0.57)	-0.0511*	(-2.09)	-0.0527*	(-2.42)
Agreeableness	0.0207**	(2.93)	0.0206**	(3.16)	0.0517	(1.76)	0.0475	(1.66)
Conscientiousness	0.0202**	(2.70)	0.0213***	(3.55)	0.0114	(0.44)	0.0136	(0.51)
q50								
d_vol_weekly	0.147**	(3.05)			0.234	(1.10)		
d_vol_monthly	0.0323	(0.63)			0.316*	(2.08)		
d_vol_less	-0.00248	(-0.04)			0.0226	(0.09)		
d_vol_yearly	0.0807	(1.33)			0.226	(1.16)		
volunteering			0.0285**	(2.94)			0.0759	(1.87)
Extraversion	0.0132***	(3.43)	0.0128**	(3.26)	0.0328*	(2.05)	0.0363**	(3.08)
Neuroticism	-0.0524***	(-13.55)	-0.0527***	(-14.86)	-0.331***	(-21.82)	-0.332***	(-23.84)
Openness	0.00142	(0.34)	0.00173	(0.47)	-0.00342	(-0.21)	-0.00503	(-0.28)
Agreeableness	0.0225***	(3.97)	0.0219***	(4.36)	0.0656**	(3.26)	0.0661***	(3.85)
Conscientiousness	0.0286***	(5.11)	0.0293***	(6.14)	0.0333	(1.81)	0.0327*	(2.02)
q75								
d_vol_weekly	0.0286	(0.64)			0.267	(1.32)		
d_vol_monthly	-0.0169	(-0.41)			0.224	(1.48)		
d_vol_less	0.0364	(0.81)			0.0760	(0.28)		
d_vol_yearly	0.0112	(0.28)			-0.0202	(-0.10)		
volunteering			0.00270	(0.32)			0.0652	(1.86)
Extraversion	0.00777*	(1.99)	0.00859*	(2.49)	0.0379*	(2.49)	0.0380**	(2.69)
Neuroticism	-0.0355***	(-11.22)	-0.0351***	(-11.05)	-0.252***	(-17.99)	-0.254***	(-17.59)
Openness	-0.00128	(-0.35)	-0.00161	(-0.54)	0.00862	(0.61)	0.00951	(0.67)
Agreeableness	0.0252***	(5.18)	0.0252***	(5.78)	0.0573***	(3.48)	0.0570***	(3.55)
Conscientiousness	0.0199***	(3.88)	0.0209***	(4.72)	0.0364*	(2.08)	0.0370*	(2.13)
q90								
d_vol_weekly	0.0325	(0.56)			0.284	(1.09)		
d_vol_monthly	0.0157	(0.31)			0.162	(0.94)		
d_vol_less	0.0202	(0.36)			0.272	(1.00)		
d_vol_yearly	-0.0339	(-0.59)			0.167	(0.71)		
volunteering			0.00222	(0.21)			0.0581	(1.48)
Extraversion	0.00787	(1.78)	0.00748	(1.91)	0.0474***	(3.44)	0.0465**	(3.07)
Neuroticism	-0.0343***	(-10.50)	-0.0354***	(-8.66)	-0.133***	(-8.98)	-0.138***	(-8.40)
Openness	-0.00337	(-0.81)	-0.00373	(-0.88)	0.0339*	(2.16)	0.0378*	(2.25)
Agreeableness	0.0275***	(5.34)	0.0277***	(5.08)	0.0624***	(3.63)	0.0576**	(2.94)
Conscientiousness	0.0152**	(2.85)	0.0156***	(3.43)	0.0242	(1.21)	0.0234	(1.00)
-								
life satisfaction								
mental well-being								
Observations	10013		10013		10013		10013	
0.10 Pseudo R2	.1949		.1947		.2162		.2158	
0.25 Pseudo R2	.1579		.1577		.1689		.1687	
0.50 Pseudo R2	.1316		.1315		.125		.1249	
0.75 Pseudo R2	.0375		.0374		.0979		.0978	
0.90 Pseudo R2	.1321		.132		.0425		.0424	

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: Quantile regressions Data from wave 18.

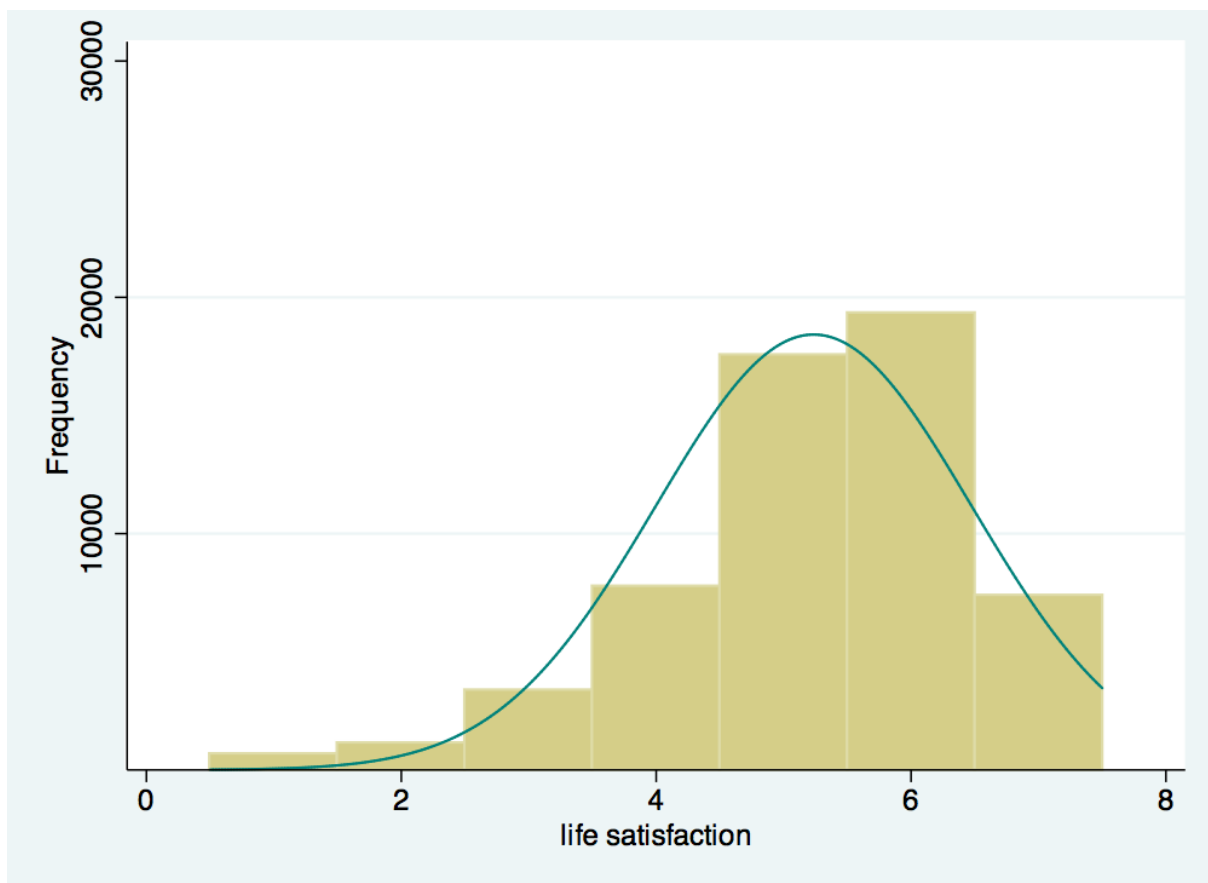
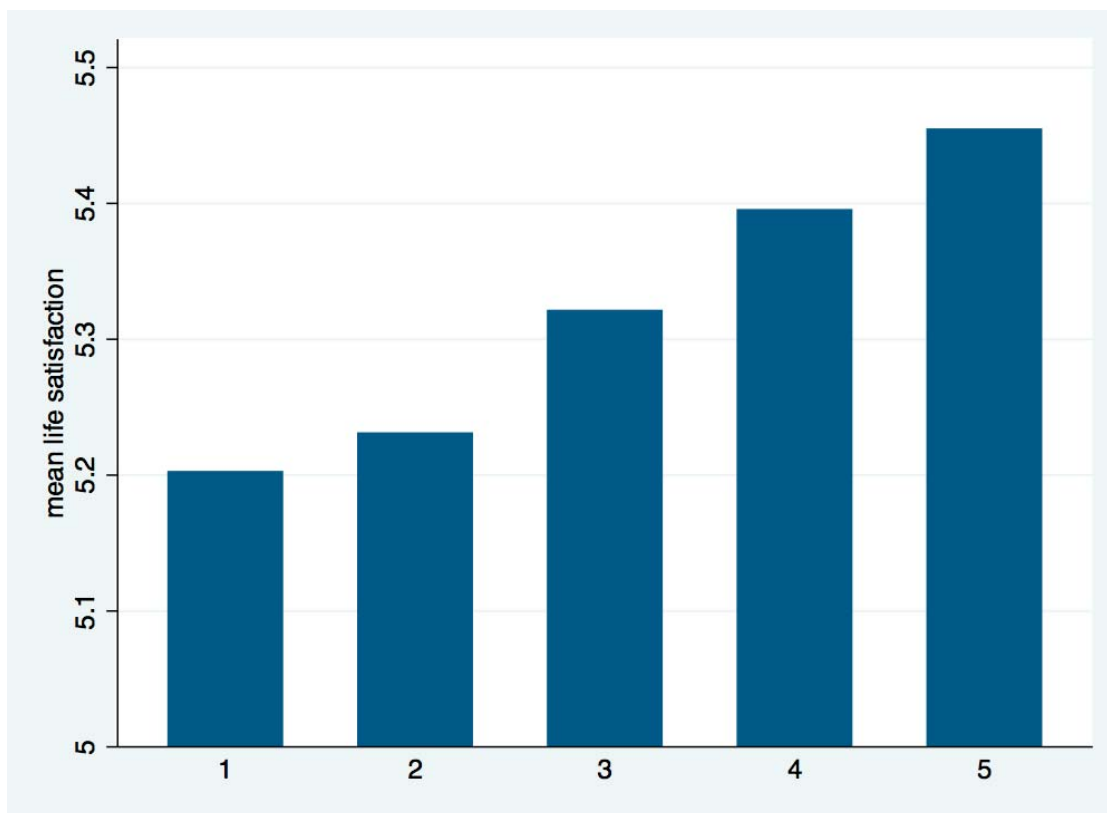


Figure 1a: The figure depicts a histogram for life satisfaction scores over our sample (overlaid with a best-fit Gaussian density, fitted to the empirical mean and standard deviation). The figure 1b depicts mean life satisfaction by different volunteering categories (from 1="Never/almost never" to 5="At least once a week").



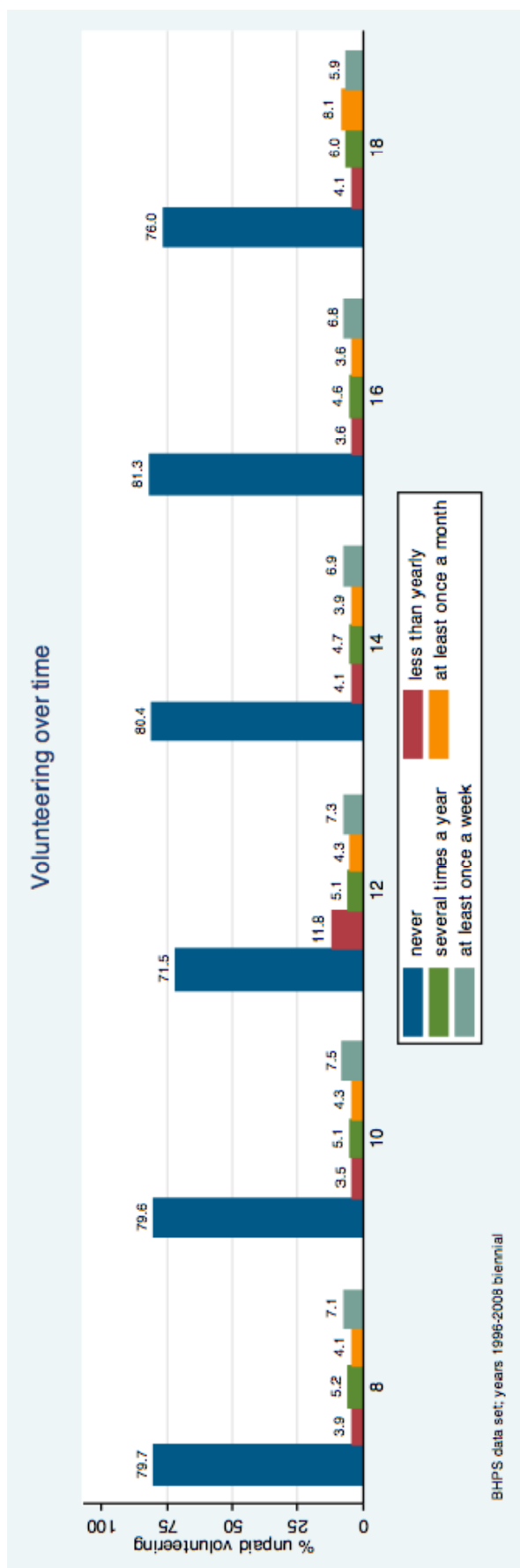


Figure 2: Volunteering by category over the years of our sample (1996-2008).

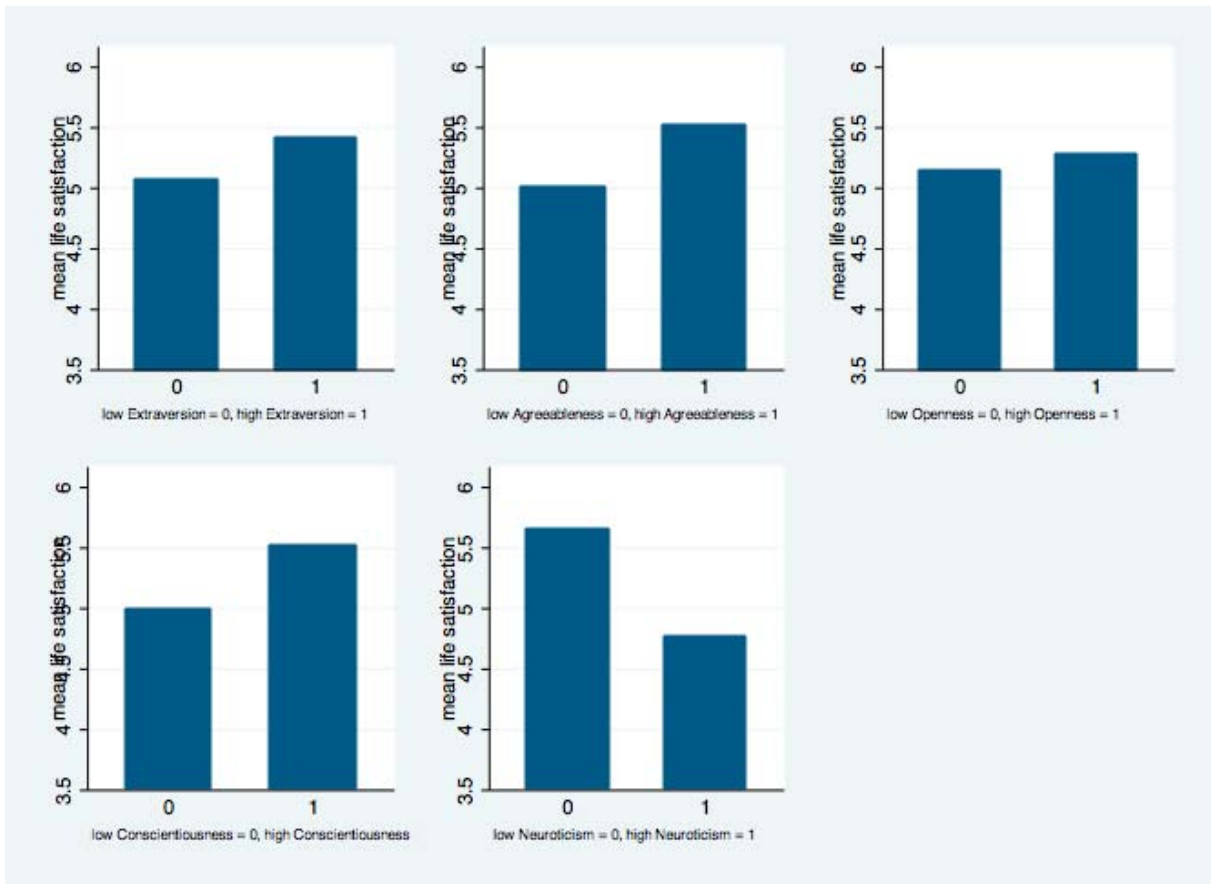


Figure 3: Comparison of mean life satisfaction for high and low personality trait expressions (1= "high" vs. 0= "low" personality trait).

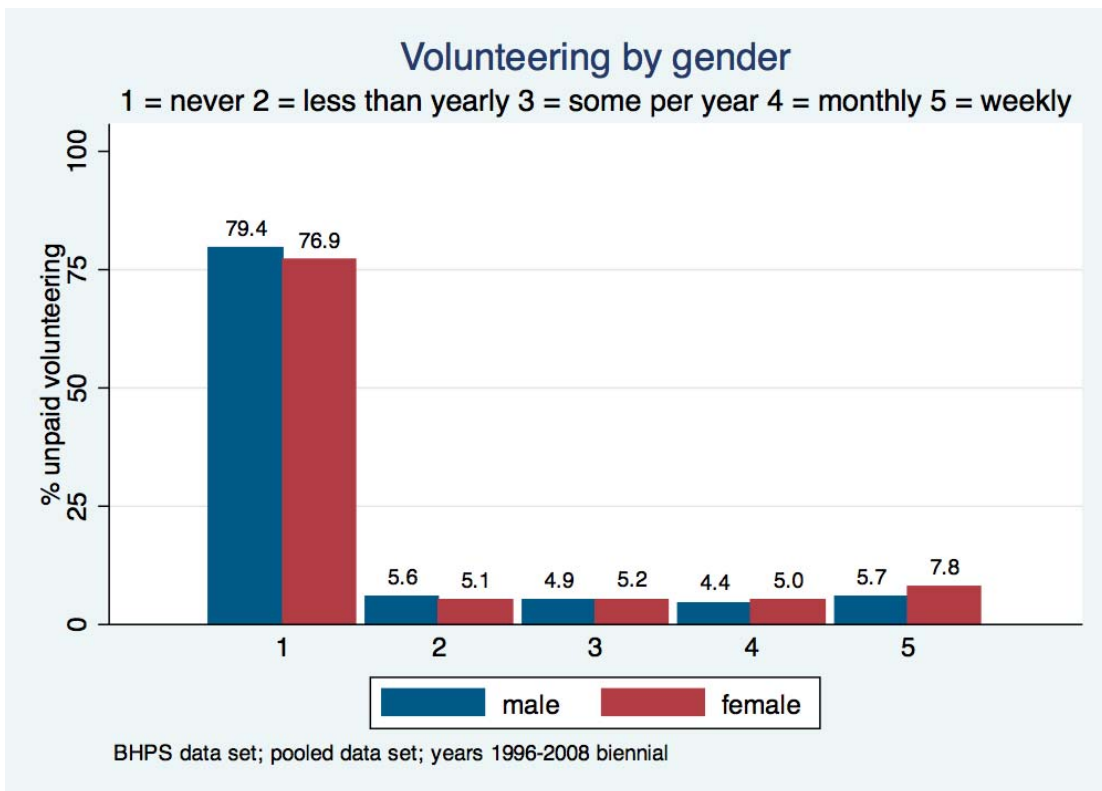


Figure 4: Volunteering by gender.