Does kindness lead to happiness? Voluntary activities and subjective well-being☆

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ABSTRACT

This paper investigates empirically the effects of voluntary activities on subjective well-being. After controlling for individual fixed effects, we show that volunteering significantly improves people's subjective well-being. The positive well-being effects of volunteering are highly heterogeneous, with larger impact at the lower end of the distribution of subjective well-being. Our dynamic analysis shows that the beneficial effects of volunteering are transitory. We find evidence of complete subjective well-being adaptation one year after volunteering. We show that more frequent socialisation, increasing satisfaction with feeling part of local community and rising satisfaction with neighbourhood living in are three channels for the contemporaneous positive linkage between volunteering and subjective well-being.

1. Introduction

Volunteering, as a form of unpaid labour to benefit people, group or organization, is an increasingly prevalent phenomenon around the world. Volunteering activities are recognized as contributing to individual well-being and to the formation of social capital, which is broadly conceived as a resource available to individuals and communities, and founded on networks of mutual support, reciprocity and trust. According to Borgonovi (2008), about 44% of the adult population in the US engage in voluntary work every year. The rate is around 22% in Britain (Binder and Freytag, 2013) and 21% in Germany (Meier and Stutzer, 2008). The empirical question that whether this altruistic behaviour is utility-enhancing for volunteers has received rising research attention in recent years. Voluntary activities have been found to be positively associated with people's subjective well-being (Thoits and Hewitt, 2001; Musick and Wilson, 2003; Borgonovi, 2008; Meier and Stutzer, 2008; Binder and Freytag, 2013; Binder, 2015; Gimenez-Nadal and Molina, 2015; Lane, 2017). However, a few other studies find that voluntary work has an adverse impact on subjective well-being (Li et al., 2005; Bjornskov, 2006).

This study contributes to this debated literature by studying the relationship between voluntary activities and subjective well-being in Australia. According to the Australian Bureau of Statistics (2014), the rate of volunteering among Australians aged over 15 increased significantly from 24% to 36% during 1995–2010. The number of adult volunteers rose from 3.2 million in 1995 to 4.4 million in 2000, before reaching 6.1 million in 2010. However, volunteering has declined afterwards, with the rate being 31% only in 2014. The trends in volunteering activities reported above are somehow surprising and in contradiction with the National Volunteering Strategy (2011) of Australia, the aim of which is to ensure that "by 2021 volunteering is encouraged, supported and recognised by all Australians". One of the focussed areas for action set out in this Strategy is "responding to trends in volunteering", which will "enable the development of better tailored strategies to attract and retain volunteers". Since volunteering is a voluntary and autonomous behaviour out of intrinsic motivation and/or extrinsic reasons, attracting and retaining volunteers necessitates the understanding of the economic impact of volunteering on their well-being.

Using data from the longitudinal Household, Income and Labour

Dynamics in Australia (HILDA) Survey, we investigate empirically the effects of voluntary activities on subjective well-being. We use fixed effects panel estimation to deal with the correlation between volunteering and unobserved heterogeneity by controlling for individual fixed effects. We also examine the heterogeneity in the effects of volunteering on different parts of the distribution of subjective well-being, using a panel data quantile regression model with fixed effects recently developed by Canay (2011). Among the existing studies, only Binder and Freytag (2013) and Binder (2015) have made attempts to contribute from the two aspects. Using data from the British Household Panel Survey (BHPS), Binder and Freytag (2013) apply propensity score matching and fixed effects panel estimation and find a positive impact of regular volunteering on subjective well-being. The paper further employs the quantile regression approach for cross sectional data and uncovers that the positive effect of volunteering is mainly driven by reducing the unhappiness of the less happy quantiles of the well-being distribution. However, the quantile approach employed by Binder and Freytag (2013) has not considered the potential confounding impact of individual fixed effects. To overcome this limitation, Binder (2015) revisits the same research question using the BHPS data, utilising the panel data quantile regression model with fixed effects developed by Canay (2011). After controlling for unobserved heterogeneity, Binder (2015) finds a significant and positive effect of volunteering on life satisfaction. However, this effect is decreasing for those in the upper parts of the well-being distribution.

This paper advances the existing literature in several ways. First, we contribute to the recent literature on the adaptation of happiness to life events (Clark et al., 2008; Cornaglia et al., 2014; Qari, 2014). This literature focuses on the way in which subjective well-being evolves after life events and examines whether individuals tend to return to some baseline satisfaction level. Existing studies such as Clark et al. (2008), Clark and Georgellis (2013), Cornaglia et al. (2014), Qari (2014) and Mahuteau and Zhu (2016) investigate empirically the dynamic influences of many life events such as marriage, divorce, widowhood, child birth, layoff, and crime victimisation on people's subjective well-being. They find evidence of full adaptation to most (positive and negative) life events within a few years. In this study, we contribute to the literature by providing the first piece of evidence on the dynamic effects of volunteering as a life event on subjective well-being. Second, while Binder and Freytag (2013) and Binder (2015) have controlled for unobserved heterogeneity in their analyses, it is not the only source of endogeneity when examining the well-being impact of volunteering. For example, if people with higher level of life satisfaction are more likely to participate in the voluntary activities (reverse causality), then the positive effects found in Binder and Freytag (2013) and Binder (2015) may have been overstated. Using the approach developed by Cornaglia et al. (2014), we are able to check whether reverse causality indeed threatens the validity of our results obtained from fixed effects regressions or not. Third, this paper provides an empirical investigation into the mechanisms through which volunteering affects subjective well-being. Among the existing studies, only Musick and Wilson (2003) have made an attempt in this direction.[1] However, the study ignores the endogeneity problem of volunteering, for example, resulting from the unobserved personality traits. Our approach can overcome this limitation by controlling for individual fixed effects.[2] Finally, we provide the Australian evidence on the mean and distributional influences of voluntary activities on subjective well-being. Namely, we check whether the findings for the UK

by Binder and Freytag (2013) and Binder (2015) are broadly representative or not.

Our analyses show that volunteering significantly improves the subjective well-being of Australians. We find that engagement in voluntary work can offset about 20%–53% of the well-being losses from unemployment and around 16%–30% of well-being losses from having a long-term health condition. The happiness brought by voluntary activities is not only statistically significant but also economically meaningful. Furthermore, the positive effects of volunteering are found to be highly heterogeneous, with larger impact at the lower end of the distribution of subjective well-being than at other parts. Thus volunteering as an activity has the potential to protecting those at the lower end of the subjective well-being distribution from well-being losses. We show that our findings are unlikely to be driven by the possible reversal relationship between volunteering and subjective well-being. Furthermore, our dynamic analysis reveals that the beneficial effects of volunteering are transitory. After a contemporaneous increase, volunteers' subjective well-being subsequently restores to the baseline level after one year. Thus, we find evidence of rapid and complete well-being adaptation to volunteering. We further show that more frequent socialisation, rising satisfaction with feeling part of local community and more satisfaction with neighbourhood living in are three mechanisms through which voluntary work leads to the contemporaneous increase in subjective well-being.

The remaining paper is organised as follows. Section 2 describes the data and presents summary statistics. Section 3 discusses the empirical approach. Section 4 presents the estimation results and Section 5 concludes.

2. Data

Starting from 2001, the Household, Income and Labour Dynamics in Australia (HILDA) Survey is a large-scale, nationally representative household panel survey in Australia. It collects annually rich information on labour market dynamics, health and subjective well-being. We use the first 14 waves of HILDA for this analysis. We restrict our attention to individuals aged 21–65. After dropping observations with incomplete information on variables of interest, our final sample comprises 117,278 observations for 20,701 individuals.

In HILDA, each respondent was asked a question on how much time the respondent spent on volunteer or charity work (for example, canteen work at the local school, unpaid work for a community club or organisation) in a typical week. We generate a binary volunteering variable which equals to one if a respondent reported positive hours on volunteer or charity work, and zero otherwise.

We use life satisfaction as a measure of overall subjective well-being, which has been used in many existing studies (Kahneman and Krueger, 2006; Clark et al., 2008). In each wave of HILDA, respondents were asked to rate their overall life satisfaction on a Likert scale of 0 (very dissatisfied) to 10 (very satisfied).

The other well-being measure we use is based on the 36-item Short Form Health Survey (SF-36). HILDA respondents were asked all SF-36 questions about their physical health and mental well-being in each wave. 14 out of the 36 questions fall in the category of mental well-being, which can be categorised into four scales: (1) Vitality (VT) (a measure of fatigue and energy); (2) Social Functioning (SF) (a measure of social limitations); (3) Role-Emotional (RE) (a measure of limitation in work or activities due to emotional health); and (4) Mental Health (MH) (a measure of feelings of anxiety and depression). These four mental well-being components are standardised to be between 0 and 100 in HILDA, with higher scores corresponding to better mental well-being. We construct our measure of overall mental well-being by averaging the scores for the four components. This measure has been widely used as index of overall mental well-being in recent health studies (Adam and Flatau, 2006; Cornaglia et al., 2014). We further

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[1] Binder and Freytag (2013) and Binder (2015) have examined the impact of volunteering on life satisfaction and satisfaction with several life domains. However, they have not investigated empirically why the positive linkage between volunteering and subjective well-being exists.

[2] Cobb-Clark and Schurer (2011) show that personality traits are stable over time for individuals in the HILDA data.

Table 1
Summary statistics.

	Full sample		Volunteering		Not volunteering		Two-sample	Wilcoxon rank-
	Mean	SD	Mean	SD	Mean	SD	*t*-test *p*-value	sum test *p*-value
Subjective well-being measures (range: 0–10)								
Life satisfaction	7.82	1.45	7.98	1.32	7.77	1.48	0.00	0.00
SF-36 mental well-being	7.55	1.92	7.70	1.80	7.51	1.95	0.00	0.00
Vitality (VT)	6.01	1.97	6.18	1.92	5.97	1.98	0.00	0.00
Social Functioning (SF)	8.34	2.29	8.47	2.14	8.31	2.32	0.00	0.00
Role-Emotional (RE)	8.43	3.17	8.55	3.05	8.41	3.20	0.00	0.00
Mental Health (MH)	7.40	1.71	7.62	1.56	7.35	1.75	0.00	0.00
Socio-economic characteristics								
Age (years)	42.18	12.45	45.19	11.58	41.41	12.54	0.00	0.00
Male (yes = 1)	0.47	0.50	0.40	0.49	0.49	0.50	0.00	0.00
Married (yes = 1)	0.72	0.45	0.77	0.42	0.71	0.46	0.00	0.00
Schooling (years)	12.43	2.23	12.77	2.32	12.35	2.20	0.00	0.00
Family size	2.96	1.42	3.22	1.50	2.90	1.40	0.00	0.00
Labour market status:								
Not in the labour force (yes = 1)	0.22	0.41	0.25	0.43	0.21	0.41	0.00	0.00
Unemployed (yes = 1)	0.03	0.18	0.03	0.187	0.03	0.18	0.77	0.78
Employed (yes = 1)	0.75	0.43	0.72	0.45	0.76	0.43	0.00	0.00
Household income (in 000s, 2002$)	84.64	65.95	86.09	71.92	83.02	64.33	0.00	0.00
Good health (yes = 1)	0.85	0.35	0.87	0.34	0.85	0.36	0.00	0.00
Long-term health condition (yes = 1)	0.23	0.42	0.23	0.42	0.23	0.42	0.06	0.06
Remoteness of living area:								
Major city (yes = 1)	0.63	0.48	0.58	0.49	0.65	0.48	0.00	0.00
Inner regional (yes = 1)	0.24	0.43	0.27	0.44	0.23	0.42	0.00	0.00
Outer regional (yes = 1)	0.11	0.31	0.13	0.34	0.10	0.30	0.00	0.00
Remote or very remote (yes = 1)	0.02	0.13	0.03	0.16	0.02	0.13	0.00	0.00
Observations	117,278		23,763		93,515			

Note: Data Source: HILDA 2001–2014.

divide this SF-36 mental well-being measure and its four components by 10 so that they share the same range as the life satisfaction variable (from 0 to 10).

Descriptive statistics are reported in Table 1. Among the 117,278 observations, about 20% ($= \frac{23,763}{117,278}$) of them take part in some volunteer work. On average, individuals who participate in voluntary activities report higher levels of subjective well-being than those who do not, and this observation is strongly supported by the two-sample *t*-test (*p*-value = 0) and the two-sample nonparametric Wilcoxon rank-sum test (*p*-value = 0).[3] Furthermore, the two-sample Kolmogorov–Smirnov test strongly rejects the null hypothesis that subjective well-being for the two groups comes from the same distribution (*p*-value = 0.00), no matter which well-being index is used. Namely, the distributions of subjective well-being for volunteers and non-volunteers are significantly different.

Table 1 also shows that when compared with those who are not involved in voluntary activities, volunteers are older and more likely to be a female. They are better educated, have a bigger family and earn higher household income. They also have better self-assessed health.[4] Furthermore, volunteers are less likely to have a long-term health

condition than those not participating in voluntary activities.[5] In addition, voluntary workers are less likely to be living in a major city in Australia.

Table 2 reports the number of years of volunteering across waves of HILDA. Among the 20,701 individuals, 13,469 have not been involved in any voluntary activities during 2001–2014. They account for around 65% of persons in our sample. Over 13% have participated in voluntary work in one year and over 6% have volunteered in two years. About 15% of individuals have done voluntary work for three or more years between 2001 and 2014. In addition, the number of persons participating in voluntary work in every one of the 14 waves is 64, accounting for only 0.3% of individuals in our data.

3. Empirical approach

We assume that subjective well-being can be described by the following equation

$$SWB_{it} = Volunteering_{it}\beta + X'_{it}\gamma + u_i + \epsilon_{it} \qquad (1)$$

where SWB_{it} denotes the measure of subjective well-being. $Volunteering_{it}$

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[3] These unconditional difference in mean well-being measures have not considered the influences of observable characteristics. A straightforward approach to test whether there are any well-being differences conditional on observable characteristics is to run an Ordinary Least Squares (OLS) regression of each of the two well-being measures on the volunteering variable and observable characteristics, and then conduct a simple F test of whether the coefficient of volunteering is equal to zero. The relevant *p*-value is zero for each of the two dependent variables, suggesting statistically significant differences in the two well-being measures between the two groups even the differences in observable characteristics have been accounted for. OLS regression results are reported in Table 3 in Section 4.1.

[4] HILDA respondents were asked to rate their self-assessed health: (1) excellent (2) very good; (3) good; (4) fair; and (5) poor. We generate a binary variable indicating good health that equals to 1 if self-reported health is excellent, very good or good, and 0 otherwise.

[5] HILDA respondents were asked whether or not having any long-term health condition, disability or impairment. These conditions include: (i) sight problems not corrected by glasses or contact lenses; (2) hearing problems; (3) speech problems; (4) blackouts, fits or loss of consciousness; (5) difficulty learning or understanding things; (6) limited use of arms or fingers; (7) difficulty gripping things; (8) limited use of feet or legs; (9) a nervous or emotional condition which requires treatment; (10) any condition that restricts physical activity or physical work (e.g. back problems, migraines); (11) any disfigurement or deformity; (12) any mental illness which requires help or supervision; (13) shortness of breath or difficulty breathing; (14) chronic or recurring pain; (15) long-term effects as a result of a head injury, stroke or other brain damage; (16) long-term condition or ailment which is still restrictive even though it is being treated or medication is being taken for it; and (17) any other long-term condition such as arthritis, asthma, heart disease, Alzheimer's disease, dementia etc.

Table 2
Number of years of volunteering.

Number of waves volunteered	Number of individuals	Percent (%)
0	13,469	65.06
1	2769	13.38
2	1303	6.29
3	855	4.13
4	610	2.95
5	396	1.91
6	289	1.40
7	220	1.06
8	185	0.89
9	159	0.77
10	113	0.55
11	108	0.52
12	89	0.43
13	72	0.35
14	64	0.31
All	20,701	100.00

Note: Data Source: HILDA 2001–2014.

Table 3
Volunteering and subjective well-being.

	Life satisfaction		Mental well-being	
	OLS	FE	OLS	FE
Volunteering	0.157***	0.045***	0.117***	0.065***
	(0.015)	(0.012)	(0.019)	(0.014)
Age	−0.095***	−0.066***	−0.061***	−0.019***
	(0.004)	(0.005)	(0.005)	(0.006)
Agesq/100	0.118***	0.069***	0.089***	0.032***
	(0.005)	(0.006)	(0.006)	(0.007)
Married	0.460***	0.416***	0.298***	0.238***
	(0.019)	(0.021)	(0.022)	(0.023)
Schooling	−0.026***	0.002	−0.004	0.008
	(0.004)	(0.010)	(0.005)	(0.012)
Family size	−0.029***	−0.028***	−0.026***	−0.014**
	(0.006)	(0.006)	(0.007)	(0.007)
Labour market status:				
Employed	—	—	—	—
Not in the labour force	0.075***	−0.029*	−0.459***	−0.276***
	(0.019)	(0.017)	(0.024)	(0.020)
Unemployed	−0.370***	−0.222***	−0.374***	−0.123***
	(0.036)	(0.030)	(0.038)	(0.031)
Log of household income	0.145***	0.066***	0.174***	0.025***
	(0.011)	(0.009)	(0.013)	(0.010)
Good health	0.984***	0.497***	1.980***	1.181***
	(0.024)	(0.018)	(0.030)	(0.024)
Long-term health condition	−0.275***	−0.151***	−0.930***	−0.403***
	(0.017)	(0.013)	(0.023)	(0.017)
Remoteness of living area:				
Remote or very remote	—	—	—	—
Major city	−0.281***	−0.055	−0.110*	-0.027
	(0.057)	(0.070)	(0.064)	(0.071)
Inner regional	−0.146**	−0.003	−0.035	0.004
	(0.058)	(0.070)	(0.066)	(0.071)
Outer regional	−0.050	−0.017	0.002	0.024
	(0.059)	(0.070)	(0.067)	(0.069)
Constant	7.433***	7.922***	5.043***	6.343***
	(0.149)	(0.188)	(0.170)	(0.217)
State dummies	Yes	Yes	Yes	Yes
Wave dummies	Yes	Yes	Yes	Yes
R-squared	0.132	0.104	0.297	0.291
Observations	117,278	117,278	117,278	117,278

Note: Standard errors clustered at the individual level are reported in parentheses. * $p < 0.1$; ** $p < 0.05$; ***$p < 0.01$.

Table 4
Heterogeneity in the effects of volunteering on life satisfaction.

	Median	Q20	Q40	Q60	Q80
Volunteering	0.041***	0.070***	0.043***	0.030***	–0.006
	(0.004)	(0.009)	(0.006)	(0.007)	(0.008)
Age	–0.062***	–0.086***	–0.075***	–0.042***	–0.034***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)
Agesq/100	0.065***	0.094***	0.080***	0.043***	0.031***
	(0.001)	(0.003)	(0.002)	(0.002)	(0.003)
Married	0.404***	0.448***	0.386***	0.380***	0.338***
	(0.003)	(0.010)	(0.006)	(0.007)	(0.010)
Schooling	0.004***	0.011***	0.004***	0.004***	–0.005***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)
Family size	–0.029***	–0.033***	–0.025***	–0.033***	–0.025***
	(0.001)	(0.003)	(0.002)	(0.002)	(0.003)
Labour market status:					
Employed	—	—	—	—	—
Not in the labour force	–0.019***	–0.052***	–0.005	0.022**	0.056***
	(0.004)	(0.011)	(0.006)	(0.009)	(0.009)
Unemployed	–0.210***	–0.267***	–0.182***	–0.155***	–0.064**
	(0.007)	(0.025)	(0.009)	(0.019)	(0.026)
Log of household income	0.061***	0.129***	0.078***	0.041***	0.003
	(0.002)	(0.006)	(0.004)	(0.004)	(0.006)
Good health	0.474***	0.691***	0.497***	0.399***	0.289***
	(0.006)	(0.017)	(0.009)	(0.011)	(0.012)
Long-term health condition	–0.140***	–0.206***	–0.155***	–0.131***	–0.069***
	(0.004)	(0.011)	(0.007)	(0.008)	(0.010)
Remoteness of living area:					
Remote or very remote	—	—	—	—	—
Major city	–0.056***	–0.043	–0.092***	–0.014	–0.028
	(0.009)	(0.032)	(0.013)	(0.017)	(0.032)
Inner regional	0.000	0.004	–0.038***	0.054***	0.025
	(0.010)	(0.032)	(0.014)	(0.018)	(0.033)
Outer regional	–0.012	0.004	–0.037***	0.019	–0.021
	(0.010)	(0.033)	(0.014)	(0.018)	(0.033)
Constant	7.917***	6.735***	7.932***	7.912***	8.899***
	(0.028)	(0.085)	(0.047)	(0.060)	(0.084)
State dummies	Yes	Yes	Yes	Yes	Yes
Wave dummies	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.048	0.066	0.051	0.038	0.023
Observations	117,278	117,278	117,278	117,278	117,278

Note: Standard errors clustered at the individual level are reported in parentheses. * $p < 0.1$; ** $p < 0.05$; ***$p < 0.01$.

is the core variable of interest, which is a binary variable equal to one if an individual is involved in voluntary activities and zero otherwise. X_{it} is a vector of explanatory variables. Following existing literature such as Dolan et al. (2008), Meier and Stutzer (2008) and Binder and Freytag (2013), we include among the covariates the following variables: age, age squared, a married dummy, years of schooling, number of family members, a binary dummy indicating whether in the labour force or not, unemployment dummy, log of household income, a binary variable indicating good health, whether having a long-term health condition, a set dummy variables indicating whether living in a major city, in inner regional Australia or in outer regional Australia. A full set of state of residence dummies and year dummies are also included in X_{it}. u_i denotes the time-invariant unobserved heterogeneity. ϵ_{it} is the idiosyncratic error term.

Table 5
Heterogeneity in the effects of volunteering on mental well-being.

	Median	Q20	Q40	Q60	Q80
Volunteering	0.059***	0.079***	0.057***	0.049***	0.039***
	(0.005)	(0.012)	(0.004)	(0.006)	(0.011)
Age	–0.005***	–0.044***	–0.020***	0.006***	0.017***
	(0.001)	(0.003)	(0.001)	(0.001)	(0.003)
Agesq/100	0.016***	0.065***	0.033***	0.002	–0.013***
	(0.001)	(0.003)	(0.001)	(0.002)	(0.003)
Married	0.228***	0.311***	0.226***	0.220***	0.148***
	(0.004)	(0.013)	(0.003)	(0.007)	(0.012)
Schooling	0.012***	0.005**	0.009***	0.014***	0.013***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.002)
Family size	–0.021***	–0.017***	–0.014***	–0.023***	–0.021***
	(0.001)	(0.004)	(0.001)	(0.002)	(0.003)
Labour market status:					
Employed	—	—	—	—	—
Not in the labour force	–0.239***	–0.332***	–0.257***	–0.208***	–0.158***
	(0.006)	(0.017)	(0.005)	(0.008)	(0.012)
Unemployed	–0.110***	–0.233***	–0.101***	–0.076***	0.029
	(0.009)	(0.042)	(0.007)	(0.019)	(0.025)
Log of household income	0.031***	0.102***	0.036***	0.014***	–0.032***
	(0.003)	(0.009)	(0.003)	(0.004)	(0.007)
Good health	1.192***	1.553***	1.289***	1.061***	0.824***
	(0.010)	(0.028)	(0.014)	(0.014)	(0.015)
Long-term health condition	–0.375***	–0.638***	–0.416***	–0.301***	–0.197***
	(0.007)	(0.017)	(0.006)	(0.009)	(0.011)
Remoteness of living area:					
Remote or very remote	—	—	—	—	—
Major city	–0.023**	–0.074**	–0.045***	–0.030*	0.011
	(0.010)	(0.033)	(0.010)	(0.017)	(0.024)
Inner regional	0.009	–0.028	–0.013	0.004	0.023
	(0.010)	(0.034)	(0.010)	(0.017)	(0.025)
Outer regional	0.031***	0.005	0.011	0.022	0.038
	(0.011)	(0.035)	(0.010)	(0.018)	(0.027)
Constant	6.006***	5.097***	6.121***	6.237***	7.252***
	(0.034)	(0.115)	(0.033)	(0.056)	(0.092)
State dummies	Yes	Yes	Yes	Yes	Yes
Wave dummies	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.034	0.078	0.048	0.032	0.013
Observations	117,278	117,278	117,278	117,278	117,278

Note: Standard errors clustered at the individual level are reported in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

The coefficient of *Volunteering$_{it}$*, β, measures the average effect of volunteering on subjective well-being. We estimate Eq. (1) with fixed effects (FE) panel estimation, which has an advantage over OLS estimation in dealing with the bias due to unobserved heterogeneity u_i.[6]

To investigate the heterogeneity in the effects of volunteering on the

full distribution of subjective well-being, we utilise the panel data quantile regression model with fixed effects (QR–FE) developed by Canay (2011). The approach considers and models individual fixed effects as location shift variables. Canay (2011) shows that the QR–FE approach can be implemented using the following two-stage estimations.

First, estimate Eq. (1) with FE panel regression to obtain consistent estimates of coefficients ($\hat{\beta}$, $\hat{\gamma}$), and then calculate the unobserved fixed effect for each individual as

$$\hat{u}_i = \frac{1}{T} \sum_{t=1}^{T} (SWB_{it} - Volunteering_{it}\hat{\beta} - X'_{it}\hat{\gamma}) \tag{2}$$

Second, estimate the conditional quantile regression model of Koenker and Bassett (1978), using ($\widehat{SWB}_{it} = SWB_{it} - \hat{u}_i$) as the dependent variable. Namely, we solve the following minimization problem

$$(\hat{\beta}_\tau, \hat{\gamma}_\tau) = arg \min_{(\beta_\tau, \gamma_\tau)} \frac{1}{NT} \sum_{i=1}^{N} \sum_{t=1}^{T} [\rho_\tau(\widehat{SWB}_{it} - Volunteering_{it}\beta_\tau - X'_{it}\gamma_\tau)] \tag{3}$$

where $\rho_\tau(u) = u[\tau - I(u < 0)]$ and I is an indicator function. The estimated coefficient $\hat{\beta}_\tau$ measures the effect of volunteer work on the τ-th percentile of the conditional distribution of subjective well-being.

4. Results

4.1. Mean and quantile estimation results

Table 3 reports the pooled OLS and FE panel estimates of β in Eq. (1), with standard errors clustered at the individual level. The OLS estimates indicate that volunteering activities are associated with significantly higher levels of subjective well-being. FE estimates also show that volunteering significantly improves people's subjective well-being. However, this significant relationship is much smaller than OLS estimates in term of magnitude, indicating that ignoring unobserved heterogeneity overstates the positive impact of volunteering. On average, volunteering can improve life satisfaction and the SF-36 mental well-being index by 0.031 (=0.045/1.45) and 0.034 (=0.065/1.92) standard deviations, respectively.

To better understand the magnitude of those average influences, we compare the estimated effects of volunteering with those of another positive life event reported by HILDA respondents: being promoted at work in the last 12 months. About 7.3% of people in our sample reported to have been promoted in the past year. Our FE estimations show that being promoted can increase life satisfaction by 0.031 points and increase mental well-being by 0.065 points. Consequently, the mean well-being improvements from participation in voluntary work are very close to those from getting a promotion. Furthermore, Table 3 shows that engagement in voluntary work can offset between 20% (=0.045/0.222) and 53% (=0.065/0.123) of the negative influences of unemployment on life satisfaction and mental well-being. Additionally, around 16% (=0.065/0.403) to 30% (=0.045/0.151) of well-being losses from having a long-term health condition can be compensated by participating in voluntary work. The comparisons made above suggest that the happiness brought by voluntary activities is not only statistically significant but also economically meaningful.

Table 3 also shows that married people have significantly higher level of subjective well-being than those who are not married. Different from the finding in Yakovlev and Leguizamon (2012), we find no evidence that education improves subjective well-being. Family size and having a long-term health condition both exert adverse influence on subjective well-being. Similar to Welsch and Kuhling (2015), we find that higher household income is beneficial for subjective well-being. Furthermore, employed individuals are happier than those not in the labour force and those who are unemployed. We do not find evidence that remoteness of living areas matters for subjective well-being.

Tables 4 and 5 display the QR–FE estimation results at the median,

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[6] The life satisfaction variable in HILDA is a discrete variable on an eleven-point Likert scale (0–10). It can be considered as an approximately continuous variable and used in quantile regressions. Binder and Coad (2011) and Binder and Freytag (2013) show that even when their measure of subjective well-being is categorical on a seven-point scale (1–7), quantile regressions are still capable of detecting heterogeneous effects of covariates on different parts of the distribution of subjective well-being. In addition, the use of a linear specification in Eq. (1) imposes the assumption of cardinality in life satisfaction answers. Nevertheless, Ferrer-i Carbonell and Frijters (2004) - show that this assumption generally does not lead to different conclusions.

Table 6
Volunteering and components of SF-36 mental well-being.

	Mean	Median	Q20	Q40	Q60	Q80
Vitality (VT)	0.096***	0.093***	0.123***	0.078***	0.088***	0.070***
	(0.015)	(0.006)	(0.012)	(0.008)	(0.009)	(0.011)
Pseudo R-squared	0.042	0.043	0.048	0.045	0.036	0.029
Social Functioning (SF)	0.086***	0.073***	0.100***	0.070***	0.064***	0.046***
	(0.019)	(0.007)	(0.023)	(0.004)	(0.011)	(0.017)
Pseudo R-squared	0.033	0.041	0.073	0.065	0.027	0.013
Role-Emotional (RE)	0.063**	0.049***	0.040***	0.046***	0.060***	0.036
	(0.029)	(0.003)	(0.011)	(0.002)	(0.010)	(0.031)
Pseudo R-squared	0.027	0.042	0.111	0.066	0.019	0.012
Mental Health (MH)	0.058***	0.052***	0.106***	0.056***	0.035***	0.003
	(0.013)	(0.005)	(0.011)	(0.006)	(0.007)	(0.009)
Pseudo R-squared	0.039	0.026	0.046	0.031	0.019	0.007

Note: The number of observations is 117,278 in all regressions. Control variables used include those used in Tables 3–5. Standard errors clustered at the individual level are reported in parentheses. ** $p < 0.05$; *** $p < 0.01$.

Table 7
Dynamic well-being effects of volunteering.

	Life	Mental well-being				
	Satisfaction	Overall	VT	SF	RE	MH
Three or more years before	0.025	−0.008	−0.052	0.002	0.010	0.012
$(\hat{\beta}_{t-(3+)})$	(0.031)	(0.033)	(0.034)	(0.044)	(0.068)	(0.031)
Two years before	0.012	−0.014	0.009	0.003	−0.054	−0.013
$(\hat{\beta}_{t-2})$	(0.018)	(0.021)	(0.022)	(0.027)	(0.044)	(0.019)
One year before (*reference*)	–	–	–	–	–	–
$(\hat{\beta}_{t-1})$						
Year of volunteering	0.051***	0.074***	0.068***	0.080***	0.085**	0.061***
$(\hat{\beta}_t)$	(0.016)	(0.020)	(0.020)	(0.026)	(0.041)	(0.018)
One year after	0.021	0.008	0.005	0.028	−0.004	0.004
$(\hat{\beta}_{t+1})$	(0.016)	(0.020)	(0.020)	(0.025)	(0.041)	(0.018)
Two years after	−0.006	0.013	−0.001	0.012	0.029	0.011
$(\hat{\beta}_{t+2})$	(0.017)	(0.021)	(0.021)	(0.027)	(0.043)	(0.019)
Three or more years after	0.002	0.004	−0.048	−0.025	0.066	0.025
$(\hat{\beta}_{t+(3+)})$	(0.037)	(0.041)	(0.041)	(0.052)	(0.078)	(0.038)
R-squared	0.095	0.129	0.089	0.186	0.054	0.106
Observations	53,894	53,894	53,894	53,894	53,894	53,894

Note: Control variables used are the same as those used in Tables 3–6. Standard errors clustered at the individual level are reported in parentheses. ** $p < 0.05$; *** $p < 0.01$.

20th, 40th, 60th, 80th percentiles of the conditional distributions of the two measures of subjective well-being. The median estimates are very close to the mean estimates reported in Table 3. As opposed to the average/median case, the positive well-being effects of volunteering are highly heterogeneous, with larger impact at the lower end of the conditional distribution of subjective well-being. For example, volunteering has over double the positive impact on life satisfaction at the 20th percentile than at the 60th. The effect at the 80th percentile is either insignificant or comparatively small in magnitude. It is quite clear that a focus on the average effect will obscure substantial heterogeneity in the effects of voluntary activities over the subjective well-being distribution. Volunteering more strongly benefits the unhappy individuals. Results in both Tables 4 and 5 suggest that volunteering as an activity has the potential to protecting those at the lower end of the subjective well-being distribution from well-being losses.

Tables 4 and 5 also show that being married has a positive but decreasing impact along the conditional distribution of subjective well-being. Household income and self-assessed good health are also found to benefit the unhappiest individuals most. Moreover, having a long-term health condition exerts a negative influence on well-being and its impact is the largest at the lower end of the distribution of subjective well-being.

It is worth going further and investigating each SF-36 component which constitutes this multifaceted indicator. The effects of volunteering may be stronger for some aspects of mental well-being and weaker for others. We estimate separately the effects of voluntary activities on each constituent of SF-36 mental well-being following the same methodology as we did with life satisfaction and the overall SF-36, and report the results in Table 6. Volunteering has a significant beneficial impact on each component of SF-36 well-being, and these mean and median effects are larger for Vitality (VT) than for the other three constituents. The positive influences are heterogeneous for Vitality (VT), Social Functioning (SF) and Mental Health (MH), generally with greater amplitude at the lower end of the well-being distribution

than at the upper part. The effects of volunteering on the distribution of Role-Emotional are positive but non-monotonic.[7]

4.2. Reverse causality and dynamic impact of volunteering

The FE and QR–FE methods we use can address the endogeneity bias resulting from unobserved individual heterogeneity such as personality traits and individual ability. However, they cannot deal with the bias from the possible reversal relationship between volunteering and subjective well-being. Individuals who have experienced a positive shock to subjective well-being may be more likely to engage in voluntary activities. If this is the case, the positive consequences of volunteering for subjective well-being may have been overstated. We exploit the longitudinal nature of HILDA and test whether there were significant increases in subjective well-being prior to the incidence of volunteering.

The approach we employ is similar to that used in Cornaglia et al. (2014). The logic is that if rising subjective well-being leads to volunteering, then before we see volunteering happens, there should be well-being increases that can be observed in the data. For example, if volunteering takes place at time t, then an increase in subjective well-being would have happened at time $t-1$, in the presence of reverse causality. Equivalently, we expect to see that the level of well-being in the year right before volunteering is higher than the well-being two or more years before volunteering happens. To this end, we perform FE panel regressions of well-being measures on a set of year dummy variables, which indicate respectively one year, two years, three and more years before or after the year in which each individual did voluntary work. The equation we estimate has the following form:

$$SWB_{it} = YearVolunteering_{it-(3+)}\beta_{t-(3+)} + YearVolunteering_{it-2}\beta_{t-2} +$$

$$YearVolunteering_{it}\beta_t + YearVolunteering_{it+1}\beta_{t+1}$$

$$+ YearVolunteering_{it+2}\beta_{t+2}$$

$$+ YearVolunteering_{it+(3+)}\beta_{t+(3+)} + X'_{it}\gamma + u_i + \epsilon_{it}$$

(4)

where $YearVolunteering_{it-j}$ is a year dummy that equals to 1 if it is j years prior to the incidence of volunteering, and 0 otherwise.[8] Similarly, the binary variable $YearVolunteering_{it+j}$ indicates j years before volunteering happens. If subjective well-being increased at time $t-1$ and leads to

volunteering activity at time t, then in our test, the well-being effect of the dummy representing two years before volunteering (t - 2) should be statistically lower than the well-being effect of the dummy representing one year prior to volunteering (t - 1). We select the dummy indicating one year prior to the incidence of volunteering (t - 1) as the base category. Consequently, we only need to test whether the estimated coefficient β_{t-2} in Eq. (4) has a negative sign and whether it is statistically significant.

Table 7 reports the estimation results. The size of the sample used for estimations has decreased significantly from 117,278 in Table 3 to 53,894, since we only include those who have been observed consecutively for at least seven years in our dynamic estimations. We find that the estimated coefficient, $\hat{\beta}_{t-2}$, is not statistically significant. Thus, we find no evidence that people's subjective well-being becomes significantly higher before volunteering. In addition, the coefficient estimate of the year dummy indicating three or more years before the incident ($\hat{\beta}_{t-(3+)}$) is also not statistically significant. This suggests that the well-being of individuals three or more years before volunteering is not statistically different to the well-being one year before the incidence of volunteering. Namely, there are no obvious changes in the level of subjective well-being prior to volunteering, when observed characteristics and unobserved individual fixed effects are controlled for. Consequently, we find no evidence that reverse causality exists.[9]

Consistent with our expectation, Table 7 shows a significant difference in subjective well-being between the year prior to volunteering and the year in which people did voluntary work, indicating a contemporaneous impact of volunteering on subjective well-being. Our dynamic analysis shows that the positive well-being effects of volunteering are short-lived. Individuals experience an immediate increase in subjective well-being after engaging in voluntary activities. Their subjective well-being subsequently restores to pre-volunteering level one year after the incidence of volunteering, if they do not continue with volunteering. It should be noted that this rapid and complete adaptation does not imply that the beneficial impact of volunteering is disregardable. Before people adapt, it is likely that the beneficial consequences of voluntary work on well-being can snowball into further positive outcomes, which may subsequently have effects on individuals' well-being. For example, Fritjers et al. (2014) show that a one standard deviation increase in mental health leads to 30 percentage point increase in employment rate in Australia. As we find that volunteering improves well-being by 0.034 (= 0.065/1.92) standard deviation, the indirect positive employment effect of volunteering can be estimated to be in the magnitude of 1.0 (= 0.034*30) percentage points. This is a reasonably large effect when compared with the 3.0 percentage point increase (from 72.5% to 75.5%) in the employment rate of Australians in our HILDA sample during 2001–2014.

4.3. Mechanisms through which volunteering affects subjective well-being

Sections 4.1 and 4.2 show robust evidence that voluntary activities have a positive impact on subjective well-being. Meier and Stutzer (2008) discuss that the channels for this positive relationship can be roughly divided into two groups: (1) intrinsic motivation, which

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[7] The above analyses consider the influence of the status of volunteering on subjective well-being. However, another dimension of volunteering, the number of hours spent on voluntary activities, may also have an impact. We find that longer hours spent on volunteering can improve life satisfaction and mental well-being. Moreover, we see a monotonic decrease in the beneficial impact of volunteering hours over the distribution of subjective well-being. People at the lower end of the overall well-being distribution feel the positive impact of volunteering hours to a larger extent than those at the higher end. We further find that the heterogeneous influences on overall well-being are primarily driven the dispersed effects of hours spent on voluntary activities on Social Functioning (SF) and Mental Health (MH). The impact of volunteering hours is uniform across the distribution of Vitality (VT). By including additionally the squared term of hours of volunteering in our estimations, we also detect an invert–U relationship between hours of voluntary work and subjective well-being. However, over-interpretation of the above findings should be avoided. As cautioned in Thoits and Hewitt (2001), it is highly likely that there are measurement errors in the reported hours of voluntary work. Inaccurate recalls, unrealistic demand for precision in hours are clearly among the reasons for measurement errors. Social desirability pressure can also lead to over-reporting of volunteering hours. Our fixed effects panel data approaches rely on within person variation for identification. When present, small measurement errors can become large relative to the within-variation in hours of voluntary work. For this reason, measurement error bias is generally believed to be larger in fixed effects estimations than in the context of OLS estimations. Detailed results are available upon request.

[8] It should be noted that $YearVolunteering_{it-j}$ does not indicate whether volunteering happens or not in year $t - j$.

[9] HILDA respondents also reported their frequency of giving money to charity if asked (*very often, often, sometimes, occasionally, rarely, never*). However, the information is available only in waves 6, 10 and 14. Using FE and FE–QR regressions, we find that individuals who *often* or *very often* donate money to charity have higher level of subjective well-being than those who *occasionally* or *sometimes* make charitable contributions. People who *never* or *rarely* contribute to charity are least subjectively well. Unlike the effects of volunteering, the effects of making charitable donations are very similar across the distribution of subjective well-being. However, we are unable to check whether the well-being effects of charitable contributions are driven by reverse causality or not, as the information on charitable contributions is only available in waves 6, 10 and 14. Detailed results are available upon request.

Table 8
Summary statistics about possible mechanisms considered.

	Full sample	Volunteering	Not volunteering	Two-sample *t*-test *p*-value	Wilcoxon rank-sum test *p*-value
Socialising frequently with friends/relatives (yes = 1)	0.58 (0.49)	0.63 (0.48)	0.56 (0.50)	0.00	0.00
Satisfaction with feeling part of local community (0–10)	6.67 (2.12)	7.50 (1.83)	6.46 (2.14)	0.00	0.00
Satisfaction with the neighbourhood living in (0–10)	7.83 (1.71)	8.07 (1.55)	7.77 (1.74)	0.00	0.00
Observations	115,786	23,516	92,270		

Note: Data Source: HILDA 2001–2014. Standard deviations are reported in parentheses.

indicates that people's well-being increases because of volunteering *per se*; and (2) extrinsic reasons, which suggests that people's utility increases because they receive an extrinsic reward from helping others. Among extrinsic reasons, Musick and Wilson (2003) discuss that there are two types of mechanisms: (1) social resources (referring to the amount of social interaction people have with others); and (2) psychological resources (referring to the positive cognition and affect generated by volunteering).

The HILDA data have information on the frequency respondents get together socially with friends/relatives, which consists of the following seven categories: (1) every day; (2) several times a week; (3) about once a week; (4) 2 or 3 times a month; (5) about once a month; (6) once or twice every 3 months; and (7) less often than once every 3 months. We generate a binary variable for frequency socialisation that equals to one if respondents get together socially with their friends/relatives at least once per week. This variable is used as an indicator of social resources from voluntary work. Socialisation has been widely proven in the literature that can result in increased level of subjective well-being (McAuley et al., 2000; Thoits and Hewitt, 2001).

HILDA respondents were also asked to report their satisfaction with feeling part of local community and satisfaction with neighbourhood living in. Rated on a Likert scale of 0 (very dissatisfied) to 10 (very satisfied), these two measures are used as indicators of psychological resources potentially available to people involved in volunteering. van Praag et al. (2003) postulate that the overall life satisfaction can be considered as a global conception of well-being that aggregates and depends on the happiness with different domains of life. Satisfaction with feeling part of local community and satisfaction with neighbourhood living in, as domains of life satisfaction, can cause increase in overall life satisfaction.

Table 8 shows that about 63% of Australians engaged in voluntary work are involved in frequent socialisation, higher than the 56% of those who do not volunteer. In addition, voluntary workers also report higher levels of satisfaction with feeling part of local community and

satisfaction with neighbourhood living in.

To examine the impact of volunteering on the three possible channels, we conduct fixed effects (FE) panel estimations of the following form

$$SWB_{it} = Volunteering_{it}\beta + Channel_{it}\theta + X'_{it}\gamma + u_i + \epsilon_{it} \quad (5)$$

where $Channel_{it}$ denotes one or all the possible mechanisms. X_{it} is a vector of controls, the same as those displayed in Tables 3–7. If the three measures of social resources and psychological resources are indeed the channels through which volunteering affects subjective well-being, we will see after the estimation of Eq. (5) that: (1) the positive coefficient of volunteering (β) decreases in magnitude; and (2) the mechanism variables have positive and significant effects on subjective well-being.

Table 9 reports the fixed effects (FE) regression results. Control variables used are the same as those used in Tables 3–7. We conduct the estimations by separately including the mechanism variables. Results when all three mechanism variables are included are also reported. We find that the coefficient estimates of volunteering have decreased in magnitude in each specification used, when compared with those displayed in Table 3. The three mechanism variables all have positive and significant effects on subjective well-being. Moreover, Table 9 shows that volunteering affects both life satisfaction and mental well-being more strongly through the channel of satisfaction with feeling part of local community than through the other two channels. Voluntary activities may bring people in the local community together, create more sense of belonging and generate positive cognition and affect among voluntary workers, which lead to subsequent increase in overall subjective well-being.

5. Conclusion

Using data from the longitudinal Household, Income and Labour Dynamics in Australia (HILDA) survey, this paper estimates the effects

Table 9
Mechanisms for the well-being effects of volunteering.

	Life satisfaction				Mental well-being			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Volunteering	0.042*** (0.012)	0.014 (0.011)	0.032*** (0.011)	0.009 (0.011)	0.058*** (0.014)	0.038*** (0.014	0.059*** (0.014))	0.036** (0.014)
Mechanisms:								
Socialising frequently with friends/relatives	0.093*** (0.010)			0.059*** (0.009)	0.166*** (0.011)			0.151*** (0.011)
Satisfaction with feeling part of local community		0.158*** (0.003)		0.059*** (0.003)		0.070*** (0.003)		0.053*** 0.003
Satisfaction with the neighbourhood living in			0.188*** (0.004)	0.114*** (0.004)			0.073*** (0.004)	0.049*** (0.004)
R-squared	0.113	0.214	0.232	0.270	0.298	0.310	0.306	0.319
Observations	115,786	115,786	115,786	115,786	115,786	115,786	115,786	115,786

Note: Control variables used are the same as those used in Tables 3–7. Standard errors clustered at the individual level are reported in parentheses. ** $p < 0.05$; *** $p < 0.01$.

of voluntary activities on individual subjective well-being. Our analysis presents robust evidence that volunteering has a significantly positive impact on people's subjective well-being. We find no evidence that this positive relationship is driven by reversal causality. The positive well-being effects of volunteering are found to be highly heterogeneous, with greater amplitude at the lower end of the well-being distribution than at the upper part. Our dynamic analysis shows that the beneficial effect of voluntary work on subjective well-being is transient. After a contemporaneous increase, people's subjective well-being restores to the baseline level one year after volunteering. We further show that more frequent socialisation, rising satisfaction with feeling part of local community and more satisfaction with neighbourhood living in are the three mechanisms through which voluntary work leads to the contemporaneous increase in subjective well-being.

Given the beneficial impact of volunteering on subjective well-being, a natural question to ask is: why do not all people volunteer? The evidence of the temporary nature of this effect as reported in this study is consistent with an answer to this question that relies on differences between decision utility inferred from observed choices and experience utility resulting from the outcome of a choice (Kahneman et al., 1997), where the latter is usually measured as happiness in data.

To bridge the gap between decision utility and experienced utility, policy makers are already very aware of the importance of providing citizens with information and decision support that accompany opportunities for voluntary activities. Informational campaigns through channels such as television and internet can be utilised to advertise the benefits of voluntary work for volunteers. Non-volunteers, who would otherwise have increased their level of happiness had they volunteered, may have underestimated the intrinsic and extrinsic benefits of voluntary activities.

Secondly, by designing a legal framework to the choice environment that contributes to minimize the cost of volunteering activities, governments can successfully support these choices. For example, in 2003 Australia has recently amended the Civil Liability Act to protect volunteers from civil liability while doing community work.

Thirdly, policy-makers can provide economic incentives to promote engagement in voluntary work and other altruistic activities. We are mindful of the fact that the success of policy initiatives to promote and support volunteerism in Australia and elsewhere often relies not only on the adoption but also on the appropriate implementation of these policy measures and that policy implementation requires a comprehensive analysis of local needs and constraints (Volunteering Australia, 2012).

Lastly, a focus on policy implementation may contribute to the identification of successful "nudging-based" strategies, those that are best able to making changes in the people's choice architecture (John et al., 2013). Survey reports suggest that potentially able to contribute to a gap between decision and experienced utility from volunteering might be the way the demand for volunteering work fits with other, possibly unforeseen at the time of the volunteering decision, time commitments (Volunteering Australia, 2012). Australians are asking for a wider range of ways to volunteer and for greater flexibility in how and when they volunteer under different circumstances that arise in their lives. Future work on the actual barriers affecting volunteering decisions will need to address this question more directly.

References

Adam, M.L., Flatau, P., 2006. Job insecurity and mental health outcomes: an analysis using waves 1 and 2 of HILDA. Econ. Labour Relat. Rev. 17, 143–170.

Australian Bureau of Statistics, 2014. General social survey: summary results, Australia. 2014. Category Number 4159.0, Australian Bureau of Statistics, Canberra.

Binder, M., 2015. Volunteering and life satisfaction: a closer look at the hypothesis that volunteering more strongly benefits the unhappy. Appl. Econ. Lett. 22, 874–885.

Binder, M., Coad, A., 2011. From average Joe's happiness to miserable Jane and cheerful John: using quantile regressions to analyse the full subjective well-being distribution. J. Econ. Behav. Org. 79, 275–290.

Binder, M., Freytag, A., 2013. Volunteering, subjective well-being and public policy. J. Econ. Psychol. 34, 97–119.

Bjornskov, C., 2006. The multiple facets of social capital. Eur. J. Polit. Econ. 22, 22–40.

Borgonovi, F., 2008. Doing well by doing good. the relationship between formal volunteering and self-reported health and happiness. Soc. Sci. Med. 66, 2321–2334.

Canay, A.I., 2011. A simple approach to quantile regression for panel data. Econ. J. 14, 368–386.

Clark, A.E., Diener, E., Georgellis, Y., Lucas, R.E., 2008. Lags and leads in life satisfaction: a test of the baseline hypothesis. Econ. J. 118, F222–F243.

Clark, A.E., Georgellis, Y., 2013. Back to baseline in Britain: adaptation in the British Household Panel Survey. Economica 80, 496–512.

Cobb-Clark, D.A., Schurer, S., 2011. The stability of big-five personality traits. Econ. Lett. 115, 11–15.

Cornaglia, F., Feldman, N.E., Leigh, A., 2014. Crime and mental well-being. J. Human Resour. 49, 110–140.

Dolan, P., Peasgood, T., White, M., 2008. Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. J. Econ. Psychol. 29, 94–122.

Ferrer-i-Carbonell, A., Frijters, P., 2004. How important is methodology for the estimates of the determinants of happiness? Econ. J. 114, 641–659.

Fritjers, P., Johnston, D.W., Shields, M.A., 2014. The effect of mental health on employment: evidence from Australian panel data. Health Econ. 23, 1058–1071.

Gimenez-Nadal, J.I., Molina, J.A., 2015. Voluntary activities and daily happiness in the United States. Econ. Inq. 53, 1735–1750.

John, P., Cotterill, S., Richardson, L., Moseley, A., Smith, G., Stoker, G., Wales, C., 2013. Nudge, Nudge, Think, Think: Experimenting with Ways to Change Civic Behaviour. Bloomsbury Academic Publishing.

Kahneman, D., Krueger, A.B., 2006. Developments in the measurement of subjective well-being. J. Econ. Perspect. 20, 3–24.

Kahneman, D., Wakker, P.P., Sarin, R., 1997. Back to Bentham? Explorations of experienced utility. Q. J. Econ. 112, 375–405.

Koenker, R., Bassett, G., 1978. Regression quantiles. Econometrica 46, 33–50.

Lane, T., 2017. How does happiness relate to economic behaviour? A review of the literature. J. Behav. Exp. Econ. 68, 62–78.

Li, Y., Pickles, A., Savage, M., 2005. Social capital and social trust in Britain. Eur. Sociol. Rev. 21, 109–123.

Mahuteau, S., Zhu, R., 2016. Crime victimisation and subjective well-being: panel evidence from Australia. Health Econ. 25, 1448–1463.

McAuley, E., Blissmer, B., Marquez, D.X., Jerome, G.J., Kramer, A.F., Katula, J., 2000. Social relations, physical activity, and well-being in older adults. Prev. Med. 31, 608–617.

Meier, S., Stutzer, A., 2008. Is volunteering rewarding in itself? Economica 75, 39–59.

Musick, M.A., Wilson, J., 2003. Volunteering and depression: the role of psychological and social resources in different age groups. Social Sci. Med. 56, 259–269.

van Praag, B., Frijters, P., F-i Carbonell, A., 2003. The anatomy of subjective well-being. J. Econ. Behav. Org. 51, 29–49.

Qari, 2014. Marriage, adaptation and happiness: are there long-lasting gains to marriage? J. Behav. Exp. Econ. 50, 29–39.

Thoits, P.A., Hewitt, L.N., 2001. Volunteer work and well-being. J. Health Soc. Behav. 42, 115–131.

Volunteering Australia, 2012. State of volunteering in Australia report 2012.

Welsch, H., Kuhling, J., 2015. Income comparison, income formation, and subjective well-being: new evidence on envy versus signaling. J. Behav. Exp. Econ. 59, 21–31.

Yakovlev, P., Leguizamon, S., 2012. Ignorance is not bliss: on the role of education in subjective well-being. J. Socio-Econ. 41, 806–815.