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Social connectedness and depression: Is there added value in volunteering?

Research Article

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Authors' note: This research was presented by the first author at the Psychological Society of Ireland Division of Health Psychology Annual Meeting (the Psychology Health and Medicine Conference) in March 2017, as part of the symposium *Social relationships and health: A biobehavioural perspective*.

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Abstract

The associations between volunteering and health outcomes are well-established. However, little research has identified the unique association between volunteering and health outcomes over and above the contribution of related social connectedness factors, such as social contact, group or organization membership, and social support provision; variables also implicated in health outcomes. Using large-scale cross-national cross-sectional survey data from the European Social Survey, this study models the association between volunteering and depressive symptoms. Models are conducted with and without adjustment for socio-demographic variables, and for a more comprehensive range of social connectedness factors than has been included in previous studies. The findings confirm previous studies demonstrating a link between volunteering and depressive symptoms. However, adjusted analyses indicate that this association can be explained by social connectedness and socio-demographic variables. The findings suggest that studies of volunteering and health outcomes should consider the broader social context in which the volunteer is located, as social connectedness and socio-demographic correlates of volunteering might be more closely tied to mental health than volunteering itself.

Keywords: volunteering, depression, European Social Survey, social integration, social connectedness, social support, mental health

Introduction

Theoretical models propose that volunteering confers psychological benefits by facilitating a sense of meaning in life, enhancing social support and social integration, and improving feelings of well-being (Anderson et al., 2014; Ayalon, 2008; Van Willigen, 2000). Likewise, the provision of support to others can foster social connectedness, boost self-efficacy and positive mood, and distract a person from one's own stressors (Brennan & Creaven, 2016; Piliavin & Siegl, 2007; Poulin, 2014), which in turn reduces psychological stress and enhances physical well-being and self-reported health and happiness (Borgonovi, 2008). However, evaluating the unique contribution of volunteering is important given volunteering is a modifiable social activity that could be employed as an intervention to improve health (e.g., Anderson et al. 2014).

Several strands of evidence suggest that volunteering has benefits for health. Longitudinal studies indicate that volunteering is associated with decreased dependency on others (Tang, 2009), reduced mortality (Okun, Yeung, & Brown, 2013), and sustained physical activity (Tan et al., 2009, using Experience Corps data). Using randomized controlled trial data from the Experience Corps, volunteering predicted increased walking for older women (but not men) engaged in community volunteering (Varma et al., 2016). As well as these positive associations between volunteering and physical health, similar results are observed for psychological health. In longitudinal studies, volunteering has been associated with lower psychological distress in adults aged 40 years and older (Tabassum, Mohan, & Smith, 2016) as well as a slower increase in depressive symptoms in older adults (Lum & Lightfoot, 2005), while others found that only a small proportion of the beneficial effects for older adults were attributable to the social connectedness arising from volunteering (Musick & Wilson, 2003). Li and Ferraro (2005) reported that adults with depressive symptoms demonstrated a subsequent increase in formal volunteering, suggesting that individuals

themselves perceive volunteering as favourable for their mental health. Moreover, using a quasi-experimental design, Hong and Morrow-Howell (2010) compared volunteers (aged 50 and older, from the Experience Corps sample) with matched controls (from the Health and Retirement Study) and identified that volunteers reported fewer depressive symptoms two years after participation in the programme.

Despite these reported associations between volunteering and lower depression, the threshold at which volunteering-health associations are observed is unclear. For example, using Midlife in the United States (MIDUS) data, Choi and Kim (2011) reported that 1-10 hours volunteering per month was required to derive benefits for well-being, with no added benefits beyond that level. Using data from the Americans' Changing Lives (ACL) study, Morrow-Howell, Hinterlong, Rozario, and Tang (2003) and Van Willigen (2000) reported that the positive health effects began to taper off after about 100 hours a year (or 2-3 hours per week). Moreover, although Lum and Lightfoot (2005) reported a threshold of roughly four days per week, their analyses only included individuals who volunteered a minimum of 100 hours per year to begin with, reducing hours per year to days per week. Therefore, although the potential for psychological benefits to be derived from volunteering activities is acknowledged, the minimum (and indeed, the maximum) levels needed for positive health outcomes are unclear, and hindered by variability in the focus on volunteering frequency and duration.

The psychological benefits of volunteering are thought to be especially salient for older adults (Van Willigen, 2000), compensating for a decline in important social roles that can be characteristic of older adulthood (e.g., loss of "employee" status due to retirement). To date, much of the research on volunteering and health has focused on older adult samples. Indeed, a recent review for this group (Anderson et al., 2014) concluded that most data from descriptive, cross-sectional, and prospective cohort studies consistently reveal that

volunteering is associated with lower symptoms of depression. In contrast, a systematic review and meta-analysis examining both observational and experimental designs confirmed volunteering-depression relationships in the cohort studies; however, these were not supported by the three randomized controlled trials that included depression as an outcome measure (Jenkinson et al., 2013). Therefore, studies that might explain these discrepant findings are needed to improve our understanding of how volunteering may influence health. Critically, existing findings may be limited by failure to consider potential confounding factors that may account for the volunteering-depression relationship. Indeed, in the 1970s, researchers (see Cutler, 1973) observed that the volunteering-health outcomes appeared to be eliminated when socio-demographic variables (primarily, socio-economic status [SES] and subjective health status) were controlled for (i.e., variables that predicted selection into volunteering itself). Although these socio-demographic factors are now well-understood, potential confounds related to social connectedness remain neglected, despite the fact that social connectedness variables may explain the discrepant conclusions of review papers on volunteering and health outcomes (Anderson et al., 2014; Jenkinson et al., 2013).

Firstly, almost by definition, volunteering necessitates involvement in the community, suggesting that some level of social connectedness is inherent in volunteering. Moreover, although volunteering does not necessarily involve social interaction, it is likely to include the direct or indirect provision of support, thus embedding the volunteer in a network of social exchange. Indeed, Wilson (2000) has described volunteering as “an additional social role” (p. 231), suggesting that social connectedness fosters volunteering, as those who are socially connected are more likely to be exposed to volunteering opportunities. Therefore, it seems reasonable to argue that volunteering can be conceptualized as a dimension of social connectedness, with social connectedness already established as a consistent predictor of depression. For example, in a systematic review, Schwarzbach, Luppá, Forstmeier, König,

and Riedel-Heller (2014) identified good quality social relationships, perceived social support, and the presence of confidants as protective factors for depression in older adults, with mixed findings for several other factors including emotional and instrumental support. Cruwys, Haslam, Dingle, Haslam, and Jetten (2014) contended that impaired social connectedness can not only precipitate but also *maintain* clinical depression; effects surprising given the myriad ways in which researchers have conceptualized and measured the construct. However, few volunteering-depression studies have comprehensively adjusted for social connectedness variables. Musick and Wilson (2003) adjusted for *social resources* (including frequency of attendance at social groups and frequency of social interaction). Two studies (Lum & Lightfoot, 2005; Hong & Morrow-Howell, 2010) adjusted for socio-demographic variables including marital status, but not for other measures of connectedness. Li and Ferraro (2005) controlled for “formal social integration” (frequency of telephone contact, and in-person contact, with friends, neighbours, or relatives), and religious service attendance, but not for intimate ties or good quality social support. So, while some studies have attempted to adjust for social connectedness when investigating the link between volunteering and depression, none has offered convincing evidence that they are separate and distinct constructs.

Therefore, given volunteering can be conceptualized as a form of social connectedness, and various other dimensions of connectedness have been cited as attenuating depression, the unique effect of volunteering remains to be determined. Thus, the present study sought to quantify the unique association between volunteering and depressive symptoms, over and above other dimensions of social connectedness, in a cross-national observational study of adults.

Study Hypotheses

The first hypothesis was that, in line with previous research, volunteering would be associated with lower levels of depressive symptoms in unadjusted models (Model 1). The second hypothesis was that this association would be eliminated in models adjusted for social connectedness (Model 2 and 3 [with and without adjustment for socio-demographic variables]). Based on the notion of a dose-response benefit to volunteering (Luoh & Herzog, 2002; Musick, Herzog, & House, 1999; Piliavin & Siegl, 2007), we hypothesised that increasing frequency of volunteering would be associated linearly with attenuated risk of depression, but again, not in models adjusted for social connectedness.

Methods

Participants

The analyses are based on cross-sectional data from the sixth wave of the European Social Survey (the ESS; www.europeansocialsurvey.org). The ESS a biennial multi-country survey using probability samples which are representative of all persons aged 15 years and over resident within private households in each country. The sixth wave (ESS6) was selected as, in addition to the core items administered in all waves, ESS6 included a rotating module on “Personal and Social Well-being”. This rotating module included measures of social support.

For ESS6, data were collected from 29 countries in Western Europe (countries included: Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Netherlands, Norway, Portugal, Sweden, Switzerland, United Kingdom), Eastern and South Eastern Europe (countries included: Albania, Cyprus, Czech Republic, Estonia, Hungary, Kosovo, Lithuania, Russian Federation, Slovakia, Slovenia, and Ukraine), and Israel.

Due to substantial differences in rates of volunteering between Western and Eastern Europe (Voicu & Voicu, 2009), we focused on countries likely to contain sufficient variation in volunteering to reliably address our research question. Therefore, data from the ex-communist states (Albania, Czech Republic, Estonia, Hungary, Poland, Kosovo, Lithuania, Russian Federation, Slovakia, and Ukraine), as well as Cyprus and Israel, were excluded. This ensured that a reliable association between volunteering and depression, adjusting for social connectedness could be examined, minimizing confounding related to cultural factors.

Therefore, the present analyses examined data from 15 European countries (Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom), rendering a total sample size of 27,301 participants (unweighted). Participants (51.1% women) ranged in age from 15 years to 103 years ($M = 46.59$, $SD = 18.77$).

Volunteering

Volunteering is assessed using frequency of involvement during the past year in “work for voluntary or charitable organizations”. Participants can choose one of six responses; (at least) *weekly*, *monthly*, *every three months*, *every six months*, *less often* and *never*. Cell sizes for these response options varied considerably across countries; therefore, a three-category variable was constructed. The categories were “never” (the number of people that never volunteered), “sometimes” (collapsing the, *every three months*, *every six months*, and *less often* responses), and “frequently” (collapsing the *weekly* and *monthly* categories).

Depressive symptoms

Depressive symptoms were measured using the CES-D 8-item depression inventory. The 8-item CES-D is a shortened version of the CES-D, which is a 20-item scale used as a

popular measurement of depression, particularly in American research (Perreira, Deeb-Sossa, Harris, & Bollen, 2005). The 8-item CES-D has shown reliability in a European sample (e.g., Van de Velde, Levecque, & Bracke, 2009). In the current sample, Cronbach's alpha was .81, indicative of very good internal consistency. Participants respond to 8 items on a 4-point Likert scale from 0 (*none or almost none of the time*) to 3 (*all or almost all of the time*). Total possible scores range from 0 to 24, with a higher score indicating higher symptoms of depression.

Socio-Demographic Variables

In addition to age and sex, other potential confounds of both volunteering and depression were controlled for; these were education, employment status, health status, and cohabitation status. First, models were adjusted for education, with ISCED levels recoded into: *less than upper secondary education*, *upper secondary education*, and *post-secondary education*. Second, given established associations between unemployment and psychological distress (e.g., Paul & Moser, 2009), unemployed respondents were contrasted with “not unemployed” (i.e., employed, working in the home, unable to work, or retired). Finally, because poorer physical health is associated with depression (Mulsant, Ganguli, & Seaberg, 1997), and likely with the capacity to volunteer (Li & Ferraro, 2005), models were adjusted for self-rated health (four categories: *very poor or poor*, *fair*, *good*, and *very good*) and limitations in activities of daily living (ADL; *yes/no*). For this latter item, participants were asked: “Are you hampered in your daily activities in any way by any longstanding illness, or disability, infirmity or mental health problem?” If participants responded “yes”, they were asked “is that a lot or to some extent?”, with these categories collapsed for analysis purposes. Interviewers were instructed to clarify the meaning of “hampered” as “limited, restricted in

your daily activities”, if necessary. Finally, cohabitation status was coded as *lives with partner/does not live with partner*.

Social Connectedness and Latent Class Analysis

Several social connectedness variables were assessed in ESS6; these were intimate ties, social activities, frequency of meeting others socially, and social support. Importantly, these included both quantitative measures (e.g., frequency of contact) and subjective measures (e.g., perceived social support); the latter of which are under-researched in studies of volunteering and depression. To address the likelihood that the social connectedness variables map on to a common “social connectedness” construct, a latent class analysis (LCA) was conducted to cluster respondents on these variables. LCA is a type of clustering, data reduction, technique for categorical and ordinal variables somewhat analogous to factor analysis. It predicts the likelihood that an individual will be in a particular latent class or category (McCutcheon, 1987; Vermunt & Magidson, 2005). Although volunteering can be conceptualized as a dimension of social connectedness, this was not included in the LCA, as to do so would prohibit us from determining whether the volunteering variable itself was associated with depression. Therefore, the LCA was conducted with the remaining variables; some variable categories were collapsed to improve model fit. For example; firstly, in response to the question “*how many people, if any, are there with whom you can discuss intimate and personal matters?*”, respondents were categorized as having fewer than three close ties (the median number) or three or more close ties (binary split informed by White et al., 2002 and confirmed in the present sample as more effectively classifying participants as low or moderate-to-high on connectedness, than an ordinal variable). Second, respondents were classified as engaging in less, more, or the same level of social activities compared with others of their age (*compared to other people of your age, how often would you say you take*

part in social activities?). In terms of meeting others socially, respondents were asked “*how often do you meet socially with friends, relatives or work colleagues?*” and classified as low (\leq monthly), medium (greater than monthly and up to weekly contact), and high ($>$ weekly). Support receipt and support provision were both assessed using single items – *to what extent do you receive/provide help and support from people you are close to when you need it?* with responses recoded into low support (*sometimes to never*) and high support (*most of the time to completely*). These were combined into one variable: high provide/high receive, high provide/low receive, low provide/high receive and low provide/low receive. Therefore, the ESS provided data on several key dimensions of social connectedness including cohabitation, intimate ties, and frequency of social activities, in addition to subjective perceptions of both received and provided social support.

Analysis strategy

Chi-square analyses were conducted to examine associations between volunteering and categorical covariates; one-way ANOVA examined associations between volunteering and continuous variables (including depression). Multiple regression models predicting depression were conducted unadjusted (Model 1), adjusted for the social connectedness variables (Model 2), and additionally for the socio-demographic control variables (Model 3). Given our view that volunteering and social connectedness are related constructs, we included a volunteering \times social connectedness interaction term in the models. This allowed us to isolate the volunteering variable from related connectedness variables, while considering volunteering in models also controlling for social connectedness. To determine if the volunteering-depression association was stronger for older adults, age groups were generated (<50 years, 50-59 years, and 60+ years), and age group was included as a moderator of volunteering and of social connectedness. To facilitate interpretation, subgroup

analyses for age were conducted. Clustered standard errors were used to account for the clustered nature of the data (participants nested in countries). Dummy variables were included in the analysis to control for country differences in depressive symptoms. To ensure that results were not dominated by countries with large samples, the weighting for the inferential analyses was done in a two-step process (see also Gallie [2013] and Kankaraš [2011]). First, the data were weighted by the post-stratification weight. The post-stratification weight facilitates estimates that are not affected by a possible sample selection bias, reduces the sampling error, and reduces bias attributable to non-response (European Social Survey, 2014). Then, the countries were all weighted to be the same n equal to the smallest n across countries. Unweighted percentages are reported for rates of missing data; aside from this, weighted percentages are reported unless otherwise stated.

Missing value treatment

Several strategies were used to address missing data. First, following the strategy employed in other ESS analyses (von dem Knesebeck, Pattyn, & Bracke., 2011), respondents who answered fewer than 5 items of the CES-D 8 scale were excluded (<1%). For cases missing between one and four CESD-8 items, we calculated the mean value of the available items and multiplied it with eight to obtain the scale range of 0–24. Missing data for variables included in the LCA were imputed (3.2%), and the solution size was the same with and without missing data. Finally, participants missing data on any of the other study variables (including volunteering) were excluded. This resulted in the exclusion of <3% of cases overall.

Crosstabs weighted using the two-step weight indicated some differences between included and excluded participants based on available data; excluded participants were more likely to fall into the older (60+) age group, have poorer SRH and difficulties with ADL, and

have higher depressive symptoms ($M = 5.65$ vs. $M = 5.13$, $p = .02$). Excluded participants were less likely to be cohabiting and to be in the highest education category. In terms of social connectedness, excluded participants were more likely to be moderately, and less likely to be poorly or highly, connected. Missingness was not associated with sex, employment status, or volunteering. The overall rate of missing data was low, and the included sample represented about 95% or more of participants within each category of the study variables.

Results

Descriptive statistics and frequencies

The majority of the sample were under 50 years of age (55.7%), with 17% in the 50-59 group, and the remainder (27.3%) in the 60+ group. Participants tended to be in good (45%) or very good (26.9%) health, with no limitations in ADL (77%). Participants were equally distributed across the three education categories. The majority were cohabiting or married (61.1%), and a minority were unemployed (9.7%).

The proportions of participants volunteering across countries and mean depressive symptoms scores are presented in Table 1. As can be seen, the proportion of participants *never* volunteering ranged from about one to two-thirds of the sample. There were no sex differences in volunteering $\chi^2(2) = 0.42$, $p = .81$. The mean depressive symptoms score for the overall sample was 5.13 ($SD = 3.92$); women had elevated symptoms relative to men ($M = 5.54$, $SD = 4.14$, vs. $M = 4.70$, $SD = 3.61$, $p < .001$). Volunteering was associated with higher educational attainment, and unemployed participants were less likely to volunteer. Although there were statistically significant associations between volunteering and health variables (SRH and ADL), these patterns were not strong. For example, 24.6% of those who *never* volunteered had limitations in ADL, compared with 20% of those who *sometimes* volunteered, and 22.6% of those who frequently volunteered.

 Table 1 about here

Social connectedness and volunteering

For the social connectedness construct, LCA solutions using one to eight latent classes were compared based on goodness-of-fit indices and parsimony. While AIC indicated a six-class model (see Table 2), BIC and CAIC found a three-class model to be optimal. The three-class model also clearly differentiates between those with high, medium and low levels of social connectedness (Table 3), so this solution was chosen. As expected, social connectedness clusters and volunteer categories were non-independent, $\chi^2(4) = 287.94, p < .001$, with participants in the highly connected cluster more likely to volunteer frequently relative to those who were moderately or poorly connected (Table 3). This mirrored the pattern observed for volunteering and each of the individual components of the social connectedness construct.

 Table 2 about here

 Table 3 about here

Volunteering and depressive symptoms: simple analyses

In line with the first hypothesis, our unadjusted model indicated that volunteering predicted lower depressive symptoms across the sample of 15 countries (see Table 1). Compared with those who *never* volunteered, those who engaged in *some* or in *frequent*

volunteering had lower depressive symptoms, however, the variance explained was relatively low.¹

Volunteering and depressive symptoms: adjusted analyses

Summary models adjusted for social connectedness (Model 2) and also for socio-demographic variables (Model 3) are presented in Table 4. In line with the second hypothesis, the association between volunteering and depressive symptoms was eliminated after adjustment for social connectedness, regardless of whether or not socio-demographic variables were controlled for. This suggests that the volunteering-depression association can be explained by related social connectedness and socio-demographic factors. The volunteering \times connectedness interaction terms were not significant in any of the models (results not shown). Although this does not support the notion that volunteering compensates for low social connectedness, only relatively small numbers of participants fell into the low connectedness category (< 10%), meaning that this finding should be considered with caution. The strongest predictor of depressive symptoms was self-rated health. Those with poor or very poor health had almost a 4-point (approximately 1 *SD*) elevation in depressive symptoms relative to those with good health.

Table 4 about here

Age as a moderator of the volunteering-depression association

Finally, contrary to expectations, our models including age as a moderator variable indicated a small association between frequent (vs. never) volunteering and depression for the

¹ ANOVA comparing the six categories of volunteering (with smaller cell sizes) indicated a linear relationship between volunteering and depressive symptoms; however, only the differences between the *never* category and the other categories were statistically significant. This suggests that, relative to *no* volunteering, *any* volunteering was associated with an advantage in terms of depressive symptoms, with no significant benefit beyond volunteering once every few months.

younger (<50 years) age group ($B = -0.30$, $SE = 0.11$, $CI = -0.54 - -0.05$, $p = .02$), with no effects observed for the older age groups (results not shown).

Discussion

This cross-sectional study examined if the well-established association between volunteering and depressive symptoms withstood adjustment for a more comprehensive range of social connectedness variables than has been included in previous research. The findings replicate earlier associations between formal volunteering and depressive symptoms (e.g., Li & Ferraro, 2005; Hong & Morrow-Howell, 2010). However, the analyses also suggest that this relatively small mental health advantage might be largely explained by social connectedness, and by socio-demographic and health disparities associated with volunteering.

Importantly, our findings replicate previous studies establishing a link between formal volunteering and depressive symptoms. The findings suggest that any level of volunteering was associated with a mental health advantage relative to no volunteering. Furthermore, the added advantage of regular volunteering was minimal. Although these data are observational, this finding suggests that *any* volunteering may be the threshold at which volunteering holds benefits for mental health. Importantly, this association in simple models was linear, indicating that those engaged in the *highest* levels of volunteering do not appear to be experiencing a mental health disadvantage as a result of being over-burdened, for example.

Although simple models align with previous studies on volunteering and depressive symptoms, our adjusted models indicated that social connectedness, rather than volunteering *per se*, was the more important predictor. Compared with those who were moderately connected, individuals who were highly connected had relatively lower depressive symptoms, and individuals who were poorly connected had relatively *higher* depressive symptoms. This variable was a stronger predictor of depressive symptoms than volunteering, and no

interaction effects were observed. Although we retained volunteering as a separate variable to enable us to examine associations between this variable and depressive symptoms, volunteering and social connectedness were not independent - the majority of volunteers were highly socially connected. This further underscores our assertion that volunteering can be conceptualized as part of a higher-order social connectedness construct.

Our findings support research indicating that social connectedness is important for well-being (e.g., Schwarzbach et al., 2014), and further suggest that volunteering does not compensate for poor social connectedness in other domains. However, only small proportions of participants were categorized as frequent volunteers and poorly connected, illustrating the challenges in (a) evaluating the potential benefit for volunteering in poorly connected groups and (b) disentangling volunteering from other dimensions of social connectedness.

Participants may well regard volunteering as one of their “social activities”, and/or as a form of “meeting socially with friends, relatives, or work colleagues”, posing a further challenge to the isolation of volunteering. In particular, it is possible that participants include their volunteerism when describing their experiences of providing social support. In the ESS, the item assessing social support provision focuses on “help and support from people *you are close to*”, while the volunteering item relates to formal volunteering. Therefore, although individuals selecting into volunteering are also likely to be the type of individuals who view themselves as supportive in their close relationships, the measurement of volunteering and support provision is reasonably separable in the ESS.

Critically, the mental health advantage associated with volunteering was eliminated once social connectedness and socio-demographic differences were accounted for. This suggests that the correlates (or determinants) of volunteering, rather than volunteering in itself, might explain much (if not all) of the advantage of volunteering for depressive symptoms. In light of several studies espousing the benefits of volunteering, this assertion

might appear contentious. However, associations between SES and depression (Melchior et al., 2013; Nobles, Weintraub, & Adler, 2013), and self-rated health and depression (Han, 2002), are also well-established, so it is unsurprising that these correlates of volunteering are more strongly predictive of depressive symptoms in this sample. Nonetheless, alternative explanations should be considered. It is possible that volunteering is more beneficial for some groups than for others, even within our sample, and that group-level analyses obscure effects for specific sub-groups. For example, Poulin (2014) reported that volunteering specifically benefits individuals who value others, while others contend that the motives for volunteering are important determinants of whether or not benefits will be derived (Konrath, Fuhrel-Forbis, Lou, & Brown, 2012). In addition, Schwarzbach et al. (2014) propose that being engaged in several types of activities might prevent depression, but may not have a significant impact when already suffering from depression; a hypothesis that cannot be resolved with cross-sectional data. However, the association between volunteering and depressive symptoms in unadjusted models suggests that volunteering might at least act as a marker for psychological health, and it is premature to dismiss the potential impact of volunteering given the alternative explanations discussed. Rather, it seems prudent to consider a wider range of social connectedness variables in volunteering research than is typically done, at present. Importantly, our null findings also align with experimental evidence that has failed confirm a mental health benefit for volunteering (Jenkinson et al., 2013). Our adjustment for a more nuanced measure of social connectedness may explain why the volunteering-depression association was eliminated in our analyses, in contrast to other studies (e.g., Hong & Morrow-Howell, 2010; Li & Ferraro, 2005; Lum & Lightfoot, 2005), and provides one potential explanation for why experimental evidence does not support the findings of other observational studies.

Given a large literature describing the particular benefits of volunteering for older adults, it is surprising that our analyses did not identify age as a moderator of associations between volunteering and depression. Indeed, subgroup analyses indicated that the association was observed for frequent volunteers aged less than 50 years, though this may reflect increased power given the larger cell size for this group. Importantly, although studies typically report benefits for older groups, relatively little research has examined volunteering in younger groups. Given the majority of research focuses on only older adults (e.g., Li & Ferraro, 2005; Lum & Lightfoot, 2005; Hong & Morrow-Howell, 2010), our findings indicate that further research on volunteering in younger age groups may be warranted.

Limitations and Future Research

Our findings pertain to a subsample of countries in ESS – excluding countries outside of Western Europe, including the ex-communist states. This was deemed prudent given the previously reported differences in volunteering rates between Western and Eastern Europe (Voicu & Voicu, 2009). In fact, preliminary analyses of the dataset suggested that including these countries resulted in some inappropriately small cell sizes for analyses, with exceptionally low rates of volunteering at the time of data collection. However, given rates of volunteering are not necessarily stable over time, future iterations of ESS containing social connectedness variables may facilitate replication studies using a larger sample. In fact, within ESS6, a further examination of volunteering rates in Western and Eastern Europe, similar to that of Voicu and Voicu would offer an updated examination of these cultural differences. In addition, an examination of country-level effects, linked to cultural-level variables would also offer a more comprehensive view of volunteering and the association with health-related outcomes.

Our analyses operationalized volunteering in terms of the frequency of volunteering over the past 12 months. However, volunteering has also been measured in terms of the number of hours (Ayalon, 2008; Poulin, 2014; Van Willigen, 2000), the number of volunteering roles (Van Willigen, 2000), and the organizational context, with Morrow-Howell et al. (2003) describing how aspects of the volunteer experience are important in determining the level of benefit derived. Volunteering is a complex concept that may not be adequately captured by frequency variables. Nonetheless, given frequency of volunteering is assessed in several prospective studies of health (e.g., Health and Retirement Study, the English Longitudinal Study of Ageing, and the Wisconsin Longitudinal Study), the present findings complement this literature. Furthermore, even a complex measure of volunteering including hours, roles, frequency, motives, and subjective perceptions of the volunteering activity is unlikely to capture the broader context of volunteering in terms of volunteer organization characteristics, social connectedness derived from the volunteer activity, and support provision outside of the explicit volunteering context.

Our analyses also included the creation of a social connectedness variable based on several key items from the ESS. Although this has the advantage of minimising collinearity between closely related constructs, some categories of these variables were collapsed to facilitate interpretable clusters across countries and across age. Although this allowed analyses based on a large cross-national sample across a wide age range, age and cultural variation in social connectedness has been described (e.g., Fiori et al., 2008), and could not be captured within our social connectedness construct. For example, older adults are posited to selectively narrow their social networks over time (*socio-emotional selectivity theory*; Carstensen, 1995), and thus, the presence of intimate ties may be more important for this group than for younger adults. Correspondingly, the benefits of volunteering may vary across cultures, as volunteering could act as a compensatory mechanism for less cohesive ingroup

relationships in individualistic cultures. Thus, future research modelling social connectedness for different age and/or cultural groups could help clarify the extent to which different dimensions of connectedness are important. This could enhance decision-making in relation to collapsing or combining different elements of connectedness in large-scale data, better facilitating the consideration of volunteering in the context of social connectedness.

Finally, the present analyses rely on cross-sectional data and preclude causal inferences about the complex relationship between volunteering and depression. Extending research on physical health selection into volunteering might lead us to conclude that individuals who are more depressed are unlikely to volunteer. However, Li and Ferraro (2005) reported that functional health limitations (not depression) served as a barrier to volunteering in the ACL data, while depressive symptoms actually predicted subsequent increases in volunteering, perhaps reflecting efforts to increase sense of meaning in life, and/or social interactions. These same authors later found that depressive symptoms predicted reduced volunteering over time during middle age, but increased volunteering during older adulthood (Li & Ferraro, 2006). In summary, the relationship between depressive symptoms and volunteering is complex, no less so than the relationships between health and social connectedness at the macro level. Nonetheless, these findings contribute to the literature by demonstrating that much of the perceived benefit of volunteering for depression might be attributed to social connectedness and socio-demographic characteristics associated with volunteering.

Several avenues for future research are flagged by these findings. Primarily, given clear associations between volunteering and other dimensions of social connectedness, a remaining challenge is to determine if these differences are consistent across samples and across time. If so, this might suggest that volunteering is one facet of a stable “socially connected” profile, and if not, it might be helpful in determining contextual factors that

precipitate volunteering behaviour among individuals with otherwise similar profiles. Given that volunteering is a more modifiable dimension of social connectedness than is marriage, or the presence of intimate ties, there is considerable scope to harness the potential benefits of volunteering (albeit through social connectedness) for mental health. However, researchers must be cautious not to overstate these benefits, in light of other social connectedness and socio-demographic variables associated with volunteering that are likely to influence depression.

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VOLUNTEERING AND DEPRESSION

Table 1. Volunteering and depressive symptoms across countries ($k = 15$ countries).

	% volunteering			Depressive symptoms		
	Never	Some	A lot	Range	M	SD
Belgium	64.8	22.1	13.2	0-24	5.34	4.03
Denmark	54.2	24.7	21.1	0-22	4.50	3.28
Finland	54.5	34.8	10.7	0-24	4.64	3.41
France	69.3	13.0	17.7	0-24	5.38	4.12
Germany	47.7	22.9	29.4	0-24	5.64	3.82
Iceland	48.1	33.0	18.9	0-19	4.53	3.54
Ireland	51.3	30.5	18.3	0-24	4.51	3.89
Italy	58.1	28.5	13.4	0-24	6.76	4.47
Netherlands	45.4	22.2	32.4	0-22	4.68	3.62
Norway	37.2	39.2	23.5	0-22	3.98	3.21
Portugal	73.5	21.2	5.3	0-24	6.35	4.33
Spain	47.8	33.5	18.0	0-24	6.06	4.44
Sweden	62.7	24.5	12.8	0-24	4.66	3.68
Switzerland	46.8	22.4	30.7	0-20	4.68	3.55
United Kingdom	54.5	26.6	18.9	0-24	5.34	3.98
Overall	54.7	26.2	19.1	0-24	5.14	3.92

Note: * $p < .05$, ** $p < .01$, *** $p \leq .001$. Weighted percentages are reported.

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Table 2. Latent class analysis: model fit indices by solution size.

	1 class	2 class	3 class	4 class	5 class	6 class	7 class	8 class
BIC	221.0	-1518.3	-1585.8	-1563.1	-1540.0	-1497.5	-1436.8	-1378.1
AIC	1760.0	-30.1	-148.5	-176.5	-204.3	-212.6	-202.7	-194.8
CAIC	9.0	-1723.3	-1783.8	-1754.1	-1724.0	-1674.5	-1606.8	-1541.1

BIC, Bayesian Information Criteria; *AIC*, Akaike Information Criteria; *CAIC*, Consistent Akaike Information Criteria.

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Table 3. Latent class analysis information for three classes, reflecting moderate, high, and low levels of social connectedness, and in relation to volunteering.

	Low	Moderate	High
Cluster size	0.10	0.52	0.37
Indicators			
<i>Social activity</i>			
Less social activity than others	0.96	0.38	0.13
About the same	0.04	0.52	0.54
More social activity than others	0.00	0.10	0.33
<i>Frequency of meeting others socially</i>			
Low	0.64	0.11	0.01
Medium	0.32	0.46	0.22
High	0.04	0.43	0.77
<i>Social support</i>			
Low receipt/Low provision	0.21	0.14	0.03
Low receipt/High provision	0.19	0.12	0.06
High receipt/Low provision	0.08	0.08	0.04
High receipt/High provision	0.53	0.67	0.87
<i>Intimate ties</i>			
< 3 intimate ties	0.67	0.44	0.11
≥3 intimate ties	0.33	0.56	0.89
<i>Distribution of volunteering within clusters (%)</i>			
Never	68.4	58.4	43.8
Sometimes	20.5	25.4	30.3
Frequently	11.1	16.3	25.9

Note: Data are weighted using the two-step weighting process described in the Methods section.

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Table 4. Multiple regression models for volunteering predicting depressive symptoms (Model 1), adjusted for social connectedness (Model 2), and further adjusted for socio-demographic variables (Model 3).

Predictors (reference category)	Model 1			Model 2			Model 3			
	B	SE	95% CI	B	SE	95% CI	B	SE	95% CI	
<i>Adjusted model</i>										
Intercept	5.53			5.61			6.82			
Volunteering (never)										
	Sometimes	-0.47***	0.08	-0.65 - -0.28	-0.32*	0.12	-0.58 - -0.05	-0.01	0.10	-0.23 - 0.20
	Frequently	-0.72***	0.10	-0.95 - -0.50	-0.45***	0.10	-0.67 - -0.24	-0.16	0.10	-0.38 - 0.04
Social connectedness (moderate)										
	Low				-1.28***	0.16	-1.47 - -1.08	-0.94***	0.13	1.16 - 1.17
	High				1.85***	0.09	1.51 - 2.09	1.43***	0.08	-1.10 - -0.76
<i>Socio-demographic variables</i>										
Age groups (<50 years)										
	50-59 years							-0.20	0.10	-0.42 - 0.02
	60+ years							-0.59***	0.11	-0.84 - -0.35
Sex (women)										
	Men							-0.62*	0.07	-0.78 - -0.46
Education level (upper secondary)										
	< upper secondary							0.30***	0.07	0.16 - 0.45
	Post-secondary							0.05	0.06	-0.07 - 0.18
Employment status (unemployed)										
	Employed /other							-0.99	0.09	-1.18 - -0.81
Self-rated health (good)										
	Poor/very poor							3.95***	0.27	3.37 - 4.53
	Fair							1.18***	0.10	0.97 - 1.41
	Very good							-1.03***	0.09	-1.23 - -0.85
Difficulties with ADL (no)										
	Yes							0.97***	0.09	0.79 - 1.16
Cohabitation (not cohabiting)										
	Cohabiting							-0.94***	0.08	-1.11 - -0.77

The model includes dummy variables representing each country in comparison to a reference country (Belgium). In addition, social connectedness × volunteering interactions were included Models 2 and 3; however, no significant interaction terms were observed (results not shown). R^2 for Model 1 = 4.3%, Model 2 = 8.5%, for Model 3 = 25.63%.

Significance level: * $p < .05$, ** $p < .01$, and *** $p \leq .001$.