

Journal of Occupational Health Psychology

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Online First Publication, November 17, 2014. <http://dx.doi.org/10.1037/a0038342>

CITATION

Griep, Y., Hyde, M., Vantilborgh, T., Bidee, J., De Witte, H., & Pepermans, R. (2014, November 17). Voluntary Work and the Relationship With Unemployment, Health, and Well-Being: A Two-Year Follow-Up Study Contrasting a Materialistic and Psychosocial Pathway Perspective. *Journal of Occupational Health Psychology*. Advance online publication. <http://dx.doi.org/10.1037/a0038342>

Voluntary Work and the Relationship With Unemployment, Health, and Well-Being: A Two-Year Follow-Up Study Contrasting a Materialistic and Psychosocial Pathway Perspective

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In the present study we contrast materialistic (i.e., income and economic inequality) and psychosocial (i.e., social circumstances) pathway perspectives on whether volunteering while being unemployed mitigates the well-documented negative effects of unemployment on health, health behaviors, and well-being. We test our hypotheses using data from the 2010 and 2012 waves of the Swedish Longitudinal Occupational Study of Health (SLOSH; $n = 717$). This is a nationally representative, longitudinal, cohort survey. We compared groups of individuals who were (a) unemployed and volunteering during both SLOSH waves ($n = 58$), (b) unemployed and not volunteering during both SLOSH waves ($n = 194$), (c) employed and volunteering during both SLOSH waves ($n = 139$), and (d) employed and not volunteering during both SLOSH waves ($n = 326$). Conducting a path analysis in Mplus, we examined the interaction effects between labor market status (i.e., employed or unemployed) and voluntary work (i.e., volunteering or not) when predicting changes in health, health behaviors, and psychological well-being. Our results indicate that volunteering during unemployment significantly decreased the likelihood to smoke, the amount of cigarettes smoked, the likelihood of consuming alcohol, and the likelihood of being diagnosed with hypertension. These results support a psychosocial pathway perspective. For all other indicators no such buffering interaction effect was obtained, thereby supporting a materialistic pathway perspective. Nevertheless, for some indicators, volunteering was found to be beneficial for both the unemployed and employed. Consequently, integrating both perspectives might offer a better explanation for the onset of ill-health and ill-being.

Keywords: follow-up study, health and well-being, Sweden, unemployment, volunteering

A strand of research—ranging from papers in medicine, social sciences, and economics—has demonstrated that the onset of unemployment impacts on to indicators of ill-health, negative

health behaviors and poor psychological well-being. This evidence is supported by cross-sectional, longitudinal, and panel datasets using both subjective and objective indicators of health, health

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This research has been carried out in the framework of an Interuniversity Attraction Pole funded by the Belgian Science Policy Office under the title “If not for Profit, for What and How?” The SLOSH project is carried out within the framework of Stockholm Stress Centre, a FAS centre of excellence (grant 2009-1758). SLOSH and register linkages are covered by existing approvals from the Regional Research

Ethics Board in Stockholm (Dnr, 2006/158-31; 2008/240-32 extended 2008-07-01; Dnr, 2008/1808-32; Dnr, 2009/337-32; Dnr, 2009/493-31/3; and Dnr, 2010/0145-32) and earlier from the research ethics committee at Karolinska Institutet (1992-09-21, Dnr 92-198, extended 2000-11-15, same Dnr, plus 2003-03-10, Dnr 03-125). SLOSH is furthermore approved internally by Statistics Sweden (SCB # 24/9784/2001, # 115894/820137-8, and # 858758-6/198 633) and by the National Board of Health and Welfare (SoS). All authors are independent of their funders.

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behaviors, and well-being (for recent meta-analyses and reviews see McKee-Ryan, Song, Wanberg, & Kinicki, 2005; Mohr, & Otto, 2011; Paul & Moser, 2006, 2009).

Using American nationally representative longitudinal data, Salm (2009) found no causal effect of being unemployed on general self-rated health. This conclusion might be misleading as Salm's study only included older adults. There is indeed substantial evidence that as employees approach the legal retirement age, they might psychologically withdraw from the labor market (e.g., Ranchhod, 2006; Van Hooff, Born, Taris, Van der Flier, & Blonk, 2004), which in turn was found to result in levels of health usually found in employed samples (e.g., Warr & Jackson, 1987). Contrasting Salm's findings, Böckerman and Ilmakunnas (2009)—using panel data from the European Community Household Panel for Finland—found that long-term unemployment (i.e., operationalized as being unemployed for six months or longer) leads to poorer self-rated health. This is supported by recent work by Reine, Novo, and Hammarström (2013), which indicates that long-term unemployed men and women are respectively 3.31 (95% CI = 1.85–5.92) and 1.57 (95% CI = .83–2.99) times more likely (95% CI = 1.85–5.92) to have a suboptimal *general self-rated health*. Unemployment has moreover been associated with several serious protracting conditions such as *hypertension* (95% CI = .84–1.23; Zagożdżon, Parszuto, Wrotkowska, Dydjow-Bendek, 2014), *diabetes type II* (95% CI = 1.02–2.92; Müller et al., 2013), *rheumatic disorder* (national representative cohort study in Brazil; Giatti, Barreto, César, 2008), *musculoskeletal disorder* (95% CI = 4.1–8.1; Vahtera, Kivimäki, & Pentti, 1997), and *mental disease* (metaanalytical evidence from 140 studies; Paul & Moser, 2009).

Unemployment does not only affect one's health, it also relates to several indicators of *negative health behavior*. In this respect, Catalano, Dooley, Wilson, and Hough (1993)—using epidemiological longitudinal data—found support for the argument that unemployment increased alcohol consumption. Additionally, De Vogli and Santinello (2005) obtained evidence for the relationship between unemployment and smoking (odds of smoking were 2.78 times higher among the unemployed). In a more recent study, Compton, Gfroerer, Conway, and Finger (2014) found that unemployed respondents were more likely to report alcohol consumption (95% CI = 1.17–1.41) and tobacco use (95% CI = 1.51–1.62) than their employed counterparts. Finally, metaanalytical findings provide us with clear and unambiguous results concerning the relationship between unemployment and a wide range of *psychological well-being indicators* (e.g., McKee-Ryan et al., 2005; Paul & Moser, 2006, 2009; Winefield, 1995). Results from these meta-analyses showed that the unemployed have significantly decreased *life satisfaction* (95% CI = 1.20–2.90; Melin, Fugl-Meyer, & Fugl-Meyer, 2003), and fewer *feelings of self-realization* (95% CI = .37–1.06; Axelsson & Ejlertsson, 2002). Moreover, they reported more *depressive symptoms* (95% CI = .76–3.27; Jefferis et al., 2011) and *cognitive complaints* related to the use of higher executive functions of the brain (95% CI = 1.04–2.52; Weber et al., 2012) than their employed counterparts did.

As the evidence presented above clearly indicates that unemployment has serious negative health and well-being consequences for individuals and society as a whole, we deem it crucial to investigate potential mitigating factors for one's health, health behavior and psychological well-being in times of unemployment. We introduce voluntary work—that is (a) activities performed out

of free will, (b) without receiving remuneration, (c) in a formal organization, and (d) benefiting others (Snyder & Omoto, 2008)—as a potential beneficial factor for one's health, health behaviors and well-being during periods of unemployment. To shed more light on the potential mitigating role of voluntary work in this regard, we juxtapose two perspectives in the onset of health, health behavior, and psychological well-being within the field of social epidemiology and medicine. Based on a psychosocial pathway perspective (Marmot & Wilkinson, 2001) we argue that voluntary work is beneficial for one's health, health behavior, and well-being in times of unemployment as it substitutes for the otherwise deprived latent functions of unemployment (i.e., clear time structure and activity, collective purpose, social contacts, and status). In contrast we stipulate—based on a materialistic pathway perspective (Lynch, Davey Smith, Kaplan, & House, 2000)—that voluntary work will not mitigate the adverse health and well-being effects of unemployment because it does not substitute for the loss of income and economical equality (i.e., manifest functions of employment).

In light of this juxtaposition the contributions of this study are twofold. First, we aim to answer the question as to whether volunteering can protect the unemployed against the well-documented negative health and well-being consequences of being unemployed by contrasting a psychosocial and materialistic pathway perspective to health, health behaviors and well-being. Specifically, we investigate whether volunteering moderates the negative relationship between unemployment and one's health, health behaviors, and well-being, thereby possibly acting as a buffer. Related to this first contribution, we do not solely focus on one health measure as an outcome but focus on particular dimensions of health. In addition to the often-cited general self-rated health measure and indicators of psychological well-being, we also include more objective indicators of health (i.e., being diagnosed with a protracting or serious illness). Additionally, we shed more light on health behavior (i.e., smoking and alcohol consumption). By broadening the outcome space, we can investigate whether potential protective effect of volunteering in times of unemployment is specific to particular dimensions of health and/or well-being instead of being an overall effect.

Developing Hypotheses: Contrasting a Psychosocial and Materialistic Pathway Perspective

According to the latent deprivation theory of Jahoda (1982)—reflecting a psychosocial perspective to unemployment research—unemployment mainly impairs five latent functions of employment: (a) a clear time structure, (b) participation in a collective purpose, (c) social contacts beyond the family, (d) social status, and (e) activity. These latent functions correspond to basic human needs; hence satisfaction of these functions is associated with a psychologically healthy life (Jahoda, 1982). Although several scholars support Jahoda's latent deprivation theory (e.g., Hoare & Machin, 2010; McKee-Ryan et al., 2005; Paul & Batinic, 2010), they simultaneously argue that the latent functions of employment can be (partially) satisfied through activities other than paid employment. Even though these scholars paved the route for studies to investigate activities substituting paid employment, little is known on these matters. Martella and Maass (2000) and McKee-Ryan et al. (2005) indicated that engaging in activities that serve a

collective purpose and provide a clear time structure while being unemployed, lowered one's level of distress, and improved one's health and well-being. These scholars (Martella & Maass, 2000; McKee-Ryan et al., 2005) argue that a more time-structured and purposive use of one's time during unemployment has beneficial effects on health and well-being. Despite their suggestion that it is worthwhile to focus on activities that might reduce the negative impact of unemployment, they do not suggest any potential activities that might be beneficial for one's health and well-being in times of unemployment. Therefore, we introduce voluntary work as a prototypical activity that could (partially) substitute the deprived latent benefits of employment due to the social recognition (i.e., social status), civic purpose (i.e., participation in collective purpose), and clear time structure provided by voluntary work (e.g., Snyder & Omoto, 2008). To empirically support this assumption we adhere to a burgeoning literature, stating that those who volunteer are in good physical health (e.g., Warburton & Peel, 2008; Pillemer, Fuller-Rowell, Reid, & Wells, 2010), have a lower risk of being diagnosed with hypertension later in life (e.g., Burr, Tavares, & Mutchler, 2011), suffer less from mental health complaints (e.g., Musick & Wilson, 2003; O'Brien, Townsend, & Ebden, 2010), tend to smoke less (e.g., Oman, Thoresen, & McMahon, 1999), are less likely to use and abuse alcohol (e.g., Weitzman & Chen, 2005), are more satisfied with their life in general (e.g., Harlow & Cantor, 1996), experience fewer symptoms of depression and psychological distress (e.g., Li & Ferraro, 2005; Pillemer et al., 2010; Thoits & Hewitt, 2001), and experience more feelings of self-realization (i.e., increased self-esteem; Musick & Wilson, 2003). Consequently, and in line with a psychosocial pathway perspective, volunteering while being unemployed could (partially) satisfy the otherwise deprived latent functions of employment and consequently buffers the negative health and well-being effects of unemployment. We therefore hypothesize the following:

Hypothesis 1: According to the psychosocial pathway perspective, volunteering (time T1) moderates the negative relationship between being unemployed (time T1) and one's health, health behaviors and psychological well-being (time T2), thereby acting as a buffer.

In contrast, Fryer (1986) stated that a psychosocial pathway perspective in general and Jahoda (1982) in particular largely underestimated the role of the manifest functions of employment (i.e., financial resources) in the onset of ill-health and ill-being associated with unemployment. This can be categorized as a materialistic pathway perspective as his rationale aligns with the argumentation that income and economic inequality influence an individual's and the public's access to resources (e.g., health care, social welfare), which in turn adversely influences one's health and psychological well-being (Lynch et al., 2000). Specifically, Fryer (1986) argues that the most important negative consequences of unemployment are to be attributed to the loss of sufficient monetary resources and financial stability. In other words, it is not the deprivation from the latent functions of employment, but the financial deprivation and increased poverty that are adversely affecting one's health and psychological well-being. Several scholars (e.g., Creed & Bartrum, 2008; Creed & Macintyre, 2001; Price, Choi, & Vinokur, 2002) indeed suggest that the loss of financial

resources associated with unemployment is the most prominent stressor causing ill-health and ill-being. Although some scholars (e.g., Clary et al., 1998; Clary & Snyder, 1999) suggested that voluntary work might have indirect materialistic and career-oriented benefits (e.g., larger social network that increases the likelihood of finding employment through one of these connections), these benefits are not provided immediately and therefore are less likely to substitute the otherwise immediate deprived manifest function of employment. Fryer (1986) in contrast accounts for the *immediate and persistent* loss of the manifest functions of employment in the onset of ill-being and ill-health. Adhering to his rationale, engaging in any type of work without receiving a remuneration (i.e., voluntary work) cannot substitute for the otherwise deprived financial resources. In other words, engaging in voluntary work in times of unemployment couldn't buffer the negative health, health behavior, and well-being effects of unemployment. In view of this line of research—motivated by Fryer's agency theory (1986)—the impact of volunteering may not be all that important; we therefore formulate an alternative hypothesis:

Hypothesis 2: According to the materialistic pathway perspective, volunteering (time T1) does not moderate the negative relationship between being unemployed (time T1) and one's health, health behaviors and psychological well-being (time T2).

Method

Study Context

Traditionally, the voluntary sector has played an important role in the development of the Swedish welfare state and accorded great political importance (e.g., Lundström & Wijkström, 1995). Hence, in Swedish popular mass movements, there is a tradition of membership, involvement, and participation of citizens in these associations and movements. Historically, these movements have many members, rely on voluntary involvement, are characterized by the interests of their members, and are eager to champion the interests of society. The majority of Swedish movements belong to national organizations characterized by a steady structure and an efficient ability to mobilize support. This tradition has been imperative for the focus and character of the contemporary voluntary sector in Sweden (e.g., Jeppsson Grassman & Svedberg, 1996).

Given this background, results from the John Hopkins comparative study of the voluntary sector in different countries give some insight in the size and composition of the Swedish voluntary sector. The Swedish voluntary sector has—in terms of size and economic importance—approximately the same size as those in other Western countries and is characterized by approximately 150,000 voluntary movements (e.g., Jeppsson Grassman & Svedberg, 1996; Lundström & Wijkström, 1995). Jeppsson Grassman and Svedberg (1996) conducted a nationally representative study in Sweden and found that approximately 48% of the Swedish population was engaged in some form of voluntary work. More recently, the Eurofamcare (2009) report confirmed these findings (50% of the Swedish population engages in voluntary work). Moreover, it was found that the number of hours spent volunteering remains at high levels compared with other countries. Most

Swedes volunteer in sport and cultural associations, followed by trade unions, education, housing, and social services (e.g., Jeppsson Grassman & Svedberg, 1996; Lundström & Svedberg, 2003). This composition of the voluntary sector is substantially different from other Western countries (e.g., European countries, U.S.A., Canada). However, the determinants of volunteering were found to be highly similar in Sweden as in other Western countries. That is to say, a significantly greater number of those who volunteer were men, in white-collar jobs, had a higher educational degree, were homeowners, worked full-time, were married and/or had children, and thought of their voluntary work as an important way to contribute to society (e.g., Jeppsson Grassman & Svedberg, 1996; Lundström & Wijkström, 1995; Jegermalm & Jeppsson Grassman, 2013).

Procedure

A 2-year follow-up study was carried out using survey data from the 2010 (time T1) and 2012 (time T2) waves of the SLOSH (Swedish Longitudinal Occupational Survey of Health) study, a nationally representative longitudinal cohort survey of the Swedish working population commissioned by the Stress Research Institute at Stockholm University and approved by the Regional Research Ethics Board in Stockholm. Participants were fully informed about the study through the invitation letter. Returning a filled-out questionnaire was interpreted as informed consent. Participants chose one of two postal questionnaires, that is, one for those 'gainfully employed' (i.e., those in gainful employment for at least 30% of a full-time equivalent or 12 hours per week) and another version for those 'not gainfully employed' (i.e., those who are outside of the regular labor force and thus employed for 0%). In line with the definition of the International Labor Organization (ILO, 2000), the unemployed were described as people of working age (i.e., between the age of 25 and 65 years) who did not have a paid job or were not self-employed during a specific reference period in time (e.g., three months). However, they were physically and psychologically available for work and had taken active steps to seek a paid job (ILO, 2000). All data collection was carried out by Statistics Sweden. Statistics Sweden (SCB) only delivered data to the researchers in de-identified form, destroyed the key between ID numbers and personal identification numbers after all data collection had been completed, and protected the data in such a way that neither individuals, nor subgroups (such as employees at a certain workplace) could be identified. By doing so we do not see any major ethical problems with potential risks of misuse.

Participants

In total, 1009 individuals of working age (25 to 65 years old) who were either continuously employed or continuously unemployed filled out both the 2010 and 2012 SLOSH wave (attrition rate between both SLOSH waves = 13.39%). In line with the ILO definition of unemployment and given our research focus, we (a) excluded unemployed individuals who were voluntarily unemployed or unemployed because of a long-term illness (reducing the sample size to 787 individuals), and (b) only retained those who were continuously (non) volunteering during both SLOSH waves (further reducing the sample size to 743 individuals). This perspective was adopted, as (a) being voluntarily unemployed might

be associated with a less detrimental health, health behavior or psychological well-being (i.e., artificial deflation of the results due to a lower baseline of ill-health and ill-being), (b) being unemployed as a result of long-term illness might be related to a worse health, health behaviors, or psychological well-being (i.e., artificial inflation of the results due to a higher baseline of ill-health and ill-being), and (c) changes in employment or voluntary status might be associated with either positive or negative changes in health, health behaviors and psychological well-being (i.e., artificial inflation or deflation of the results; depending on the direction of the change). Finally, because of missing data on either the labor market status (i.e., employed or unemployed) or the voluntary work status, we excluded another 26 respondents from the sample. Consequently, the final sample ($n = 717$) comprised four groups: (a) those who were unemployed and engaged in voluntary work in both T1 and T2 ($n = 58$), (b) those who were unemployed and did not engage in voluntary work in both T1 and T2 ($n = 194$), (c) those who were employed and engaged in voluntary work in both T1 and T2 ($n = 139$), and (d) those who were employed and did not engage in voluntary work in both T1 and T2 ($n = 326$).

Of the respondents, 45.1% was male, 99.2% had Swedish nationality (0.6% was Norwegian, Finnish, Danish, or Icelandic; 0.1% was from other European countries; and 0.1% had a non-European nationality), and 74.1% was married or cohabiting. In terms of education, 26.2% had obtained a university degree, 37.1% had obtained a higher educational degree, 36.7% had obtained a compulsory degree. At the time of data collection all respondents were living in Sweden. The mean age of the respondents was 55.63 years ($SD = 13.32$) and their mean combined family income before taxes was 262.28 thousand Swedish Crowns ($SD = 138.11$). Those who engaged in voluntary work volunteered on average 5.99 hours ($SD = 5.75$) per week.

Dropout Analysis

A dropout analysis was conducted to test whether dropout between the 2010 and 2012 SLOSH wave was related to demographic (age, gender, education, marital status and income) or work-related characteristics (voluntary work and labor market status), to health (general self-rated health and protracting and/or serious illness), health behaviors (smoking and alcohol consumption), and psychological well-being (overall life satisfaction, feelings of self-realization, depressive symptoms, and cognitive complaints). Results from a logistic regression analysis showed that dropout between the 2010 SLOSH wave and the 2012 SLOSH wave could be explained by respondent's gender ($\beta = -.13$, $SE = .029$, $p \leq .001$), age ($\beta = -.13$, $SE = .001$, $p \leq .001$) and the amount of hours spend volunteering ($\beta = -.27$, $SE = .000$, $p \leq .001$). This findings implies that women, older respondents, and those who spend more hours volunteering were less likely to dropout between the 2010 and 2012 SLOSH wave.

Measures

Independent variables (2010 SLOSH wave; Time T1). *Voluntary work* was measured by asking respondents to answer the following question: *How many hours in an average week do you spend on voluntary (unpaid) work in for example a society, relief organization, religious organization, political party or nonprofit*

organization? While zero represents no voluntary work, figures above zero indicate the specific number of hours a respondent volunteered each week. We consequently used the amount of hours spend volunteering (i.e., a measurement of exposure to volunteering) as our independent variable. *Labor market status* was measured by asking respondents whether they were employed or unemployed. Responses were effect coded ($-1 = employed$ and $1 = unemployed$).

Dependent variables (2012 SLOSH wave; Time T2). *Health and health behaviors* were operationalized using (a) self-rated health, (b) smoking and alcohol consumption behavior, and (c) whether the respondent was diagnosed with a protracted and/or serious illness or complaint (i.e., hypertension, diabetes type II, rheumatic disorder, musculoskeletal disorder, or mental disease). First, *general self-rated health*—a widely used measure of perceived health status—was measured by asking respondents to rate their general state of health on a 5-point scale ranging from *very poor* (1) to *very good* (5) (Eriksson, Unden, & Elofsson, 2001). Second, *smoking behavior* was operationalized as the *amount of cigarettes smoked per day*. Third, *alcohol consumption behavior* was operationalized as the *amount of glasses alcohol consumed per day*. Finally, *diagnosed with a protracted and/or serious illness* was assessed by the question *Are you or have you been diagnosed with one or more of the following protracted and/or serious illnesses or complaints during the last 2 years?* Response options were *no*, *yes, but it did not influence my life*, *yes, it influenced my life a little*, and *yes, it influenced my life to a large extent*. For the purpose of the current analyses, the final three responses were merged into a single *yes, diagnosed* category. Consequently we obtained a binary response option (i.e., *no* and *yes*) for each of the specific pathologies under study (for a similar perspective see Leineweber, Westerlund, Hagberg, Svedberg, & Alexanderson, 2012). The specific pathologies considered were hypertension, diabetes type II, rheumatic disorder, musculoskeletal disorder, and mental disease.

Psychological well-being was operationalized by measuring (a) overall life satisfaction, (b) feelings of self-realization, (c) depressive symptoms, and (d) cognitive complaints. First, *life satisfaction* was measured by asking respondents to rate the following question: *All things considered, how satisfied or dissatisfied are you with your life as a whole?* on a 7-point scale ranging from *very dissatisfied* (1) to *very satisfied* (7) (Veenhoven, 1991). Second, *feelings of self-realization* was measured with three items from the CASP-19 (quality of life questionnaire comprising Control, Autonomy, Self-realization and Pleasure) to cover the core of self-realization: *being satisfied with the way life has turned out*, *life is full of opportunities*, and *the future looks good* (Blane, Higgs, Hyde, & Wiggins, 2004; Hyde, Wiggins, Higgs, & Blane, 2003). Response options ranged from *never* (1) to *often* (4). A mean score was calculated with a higher score indicating higher feelings of self-realization (Cronbach's $\alpha_{2010} = .99$; Cronbach's $\alpha_{2012} = .99$). Third, *self-reported depressive symptoms* was measured using the six items from the Symptom Checklist-Core Depression scale (SCL-CD₆; Magnusson Hanson et al., 2009) to cover the core symptoms of clinical depression: *feeling blue*, *feeling no interest in things*, *low energy*, *worrying too much*, *self-blame*, and *feeling everything is an effort*. A validation study in a Swedish sample of people of working age has demonstrated the psychometric qualities of the SCL-CD₆ (Magnusson Hanson et

al., 2014). Response options ranged from *not at all* (1) to a *great deal* (5). A mean score was calculated with a higher score indicating a higher probability of clinical depression (Cronbach's $\alpha_{2010} = .98$; Cronbach's $\alpha_{2012} = .99$). Fourth, *cognitive complaints* were measured with four items of The Copenhagen Psychosocial Questionnaire II (COPSOQ II), reflecting the core symptoms of cognitive complaints: *problems concentrating*, *difficulty taking decisions*, *difficulty remembering*, and *difficulty thinking clearly* (Pejtersen, Kristensen, Borg, & Bjorner, 2010). Response options ranged from *never* (0) to *always* (5). A mean score was calculated with a higher score indicating more cognitive complaints (Cronbach's $\alpha_{2010} = .98$; Cronbach's $\alpha_{2012} = .99$).

Control variables (2010 SLOSH wave; Time T1). Demographic variables such as age, gender, education, marital status and income have been shown to influence one's experience of unemployment (e.g., De Witte, Hooge, & Vanbelle, 2010; Paul & Moser, 2006, 2009). Consequently, we controlled for these variables in order to make sure that observed variance in our health, health behaviors and psychological well-being outcomes is not due to variance in these demographical variables. *Age* was measured in years. *Gender* was assessed with a direct question and coded as 0 for female and 1 for male. *Education* was assessed with a direct question and coded as 0 for compulsory education, 1 for higher educational degree and 2 for university degree. *Marital status* was assessed by asking respondents to indicate whether they were single or married/cohabiting. Responses were coded as 0 for married/cohabiting and 1 for single. Finally, respondents were asked to indicate their *mean combined family income* before taxes in thousands of Swedish Crowns.

Data Analysis

We conducted a path analysis using Mplus 7 (Muthén & Muthén, 2010). Path analysis extends (multiple) regression analysis as it allows us to simultaneously estimate path coefficients from one's labor market status, voluntary work and the interaction effect between labor market status ($-1 = employed$ and $1 = unemployed$) and voluntary work (hours spent volunteering) in 2010 to one's health, health behavior, and well-being in 2012 (Lleras, 2005). Moreover, conducting path analysis allows us to model *change*—not influenced by significant baseline differences—in these health, health behavior, and psychological well-being indicators. That is to say, any observed change in these indicators is not due to significant baseline differences between (a) those who volunteered more hours or did not volunteer during unemployment in 2010 and/or (b) those who were unemployed or not in 2010. Hence, estimating a path model allows for (a) all health, health behaviors, and psychological well-being outcomes (in 2012) to be correlated, (b) the control variables (in 2010) to be correlated with the labor market status and voluntary work (in 2010), (c) the control variables (in 2010) to be correlated with all outcome variables under study (in 2012), and (d) all outcome variables (in 2012) to be correlated with themselves (in 2010).

As all protracted and/or serious illness outcomes (i.e., hypertension, diabetes type II, rheumatic disorder, musculoskeletal disorder, or mental disease) were binary (i.e., diagnosed or not diagnosed) and their distribution was skewed to the right, we defined them as negative binomial distributed variables during the analysis

to account for this violation of normality. Moreover, smoking and alcohol consumption behavior follow a zero-inflated Poisson (ZIP) distribution, consisting of a binary part reflecting the threshold (i.e., the likelihood to smoke or not to smoke or the likelihood to consume alcohol or not) and a Poisson part reflecting the behavioral intensity (i.e., amount of cigarettes smoked or the number of alcoholic units consumed per day). The latter part is conditional on the onset of the binary part (Lambert, 1992). In other words, one can only smoke a certain amount of cigarettes or drink a specific amount of alcoholic units (i.e., Poisson part) when one is actually smoking or consuming alcohol (i.e., threshold part). Consequently, we defined smoking and alcohol consumption behavior as a ZIP variable.

However as several scholars (Böckerman & Ilmakunnas, 2009; Hammarström & Janlert, 2005; Salm, 2009) suggested that a reduced physical and psychological well-being might precede unemployment, we wish to rule out any concerns regarding reversed causation by estimating an alternative reversed causation path model in which one's labor market status and voluntary work activities in 2012 were predicted based on his or her health, health behaviors, and psychological well-being indicators in 2010. In this model, we allowed correlations between (a) one's labor market status (in 2012) and voluntary work activities (in 2012), (b) all health, health behaviors and psychological well-being predictors (in 2010), and (c) the outcome variables (in 2010) were allowed to correlate with themselves (in 2012) to model change.

Results

Before presenting the results from the normal causation and the alternative reverse causation path model, we will present (a) the correlations between all key variables, (b) a Pearson chi-square test comparing those who volunteered (in amount of hours) versus those who did not volunteer during unemployment, and (c) a Pearson chi-square test comparing those who were unemployed versus those who were employed in terms of demographical variables, health, health behavior and psychological well-being indicators. Whereas correlations are reported to indicate whether and how strongly these variables are related, the Pearson chi-square tests are presented to provide insights in the potential baseline differences between those that are (a) volunteering or not (in amount of hours), and (b) unemployed versus employed. The potential influence of these baseline differences on the final results will be discussed when dealing with the specific descriptive statistic.

Descriptive Statistics

Table 1 provides an overview of the means, standard deviations, and correlations of all variables under study. The reported mean for unemployed, hypertension, diabetes type II, rheumatic disorder, musculoskeletal disorder, and mental disease refers to the percentage of respondents that was unemployed or diagnosed with the specific protracted and/or serious illness.

Correlations between labor market status (employed and unemployed), voluntary work and the outcome variables ranged from $-.24$ to $.19$ and from $-.12$ to $.17$, respectively. Correlations between the outcomes variables ranged from $-.63$ to $.73$.

As those who volunteer (in amount of hours) during unemployment may plausibly be very different (e.g., healthier) than those

Table 1
Descriptive Statistics and Correlations Matrix

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Unemployed	.35	.96	—	-.07	-.15**	.18**	.19**	-.11*	-.07	-.04	.10*	.05	.04	-.18**	-.24**	.15**	.13**
2. Volunteer	5.99	5.75	—	—	.09*	-.06	-.10*	-.07	-.01	-.06	-.12**	.01	.01	.12**	.17**	-.03	-.08
3. Self-rated health	3.84	.92	—	—	—	-.12	-.06	-.18**	-.15**	-.18**	-.34**	-.27**	-.06	.52**	.58**	-.49**	-.42**
4. Smoking (amount)	1.35	4.13	—	—	—	—	.16**	-.11*	-.05	.02	.06	.07	-.01	-.12**	-.08	.08	-.02
5. Alcohol (amount)	1.41	.83	—	—	—	—	—	.03	-.01	-.04	.01	-.07	-.01	-.06	.05	.04	-.01
6. Hypertension	.32	.47	—	—	—	—	—	—	.36**	.16**	.19**	-.03	.09*	.02	-.01	-.02	-.01
7. Diabetes type II	.09	.29	—	—	—	—	—	—	—	.04	.08	.06	.01	.01	.05	.01	.04
8. Rheumatic disorder	.06	.24	—	—	—	—	—	—	—	—	.29**	-.03	.11*	-.05	-.03	-.02	.02
9. Musculoskeletal disorder	.32	.47	—	—	—	—	—	—	—	—	—	.16**	.11*	-.19**	.24**	.10*	.18**
10. Mental disease	.06	.25	—	—	—	—	—	—	—	—	—	—	-.02	-.34**	.40**	.39**	.39**
11. Asthma	.09	.29	—	—	—	—	—	—	—	—	—	—	—	.06	.06	-.01	-.04
12. Life satisfaction	5.63	1.36	—	—	—	—	—	—	—	—	—	—	—	—	.73**	-.59**	-.42**
13. Self-realization	3.31	.73	—	—	—	—	—	—	—	—	—	—	—	—	—	-.63**	-.49**
14. Depressive symptoms	1.75	.89	—	—	—	—	—	—	—	—	—	—	—	—	—	—	-.61**
15. Cognitive complaints	2.08	.87	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Note. $n = 717$.
* $p < .01$. ** $p \leq .001$.

who do not volunteer during periods of unemployment, we conducted a Pearson chi-square test and estimated the associated effect sizes when comparing those who volunteered while being unemployed and those who did not volunteer while being unemployed in 2010 in terms of demographical variables, health, health behaviors, and psychological well-being. This Pearson chi-square test revealed statistically significant differences between unemployed volunteers and nonvolunteers only for educational level (higher educational level among those that volunteer; $\chi^2(21, n = 252) = 3.95, p < .01$, effect size .32), the likelihood to smoke (higher likelihood to smoke among those who do not volunteer; $\chi^2(57, n = 246) = -2.53, p < .05$, effect size .17), the amount of cigarettes smoked per day (more cigarettes smoked among those who do not volunteer; $\chi^2(187, n = 245) = 5.25, p \leq .001$, effect size .26). Despite these statistically significant baseline differences between those who did and did not volunteer during unemployment, the associated effect sizes off these separate comparisons are to be considered small (Cohen, 1988).

In a similar vein, we compared those who were unemployed and those who were employed in 2010. A Pearson chi-square test revealed statistically significant differences between both groups for gender (more men being unemployed; $\chi^2(251, n = 717) = 4.38, p \leq .001$, effect size .29), age (unemployed respondents being younger; $\chi^2(251, n = 717) = -9.06, p \leq .001$, effect size .29), marital status (more single respondents being unemployed; $\chi^2(246, n = 705) = 7.04, p \leq .001$, effect size .52), general self-rated health (worse general self-rated health among the unemployed; $\chi^2(464, n = 716) = 10.62, p \leq .001$, effect size .44), the amount of cigarettes smoked per day (more cigarettes smoked among the unemployed; $\chi^2(244, n = 702) = 4.36, p \leq .001$, effect size .36), life satisfaction (lower life satisfaction among the unemployed; $\chi^2(245, n = 702) = -10.92, p \leq .001$, effect size .88), depressive symptoms (more depressive symptoms among the unemployed; $\chi^2(242, n = 696) = 8.22, p \leq .001$, effect size .63), and feelings of self-realization (less feelings of self-realization among the unemployed; $\chi^2(244, n = 699) = 21.57, p \leq .001$, effect size .89). The statistically significant baseline differences between those who were unemployed and those who were employed in 2010 had an associated effect size that can be categorized as small (i.e., gender, age, the likelihood to smoke), medium (i.e., marital status, general self-rated health, depressive symptoms), or large (i.e., life satisfaction, feelings of self-realization) (Cohen, 1988). Although it is common to assume that a small effect size hints toward low practical significance, we wish to underline the possibility that the additive effect of these comparisons (i.e., a cumulative effect) is likely to present a larger effect size and explain a larger proportion of the total variance than each of the separate comparisons. Therefore, we deem it crucial to interpret the presented effect sizes and their accompanying conclusions in light of this critical side note.

Although significant baseline differences in terms of health, health behavior or/and well-being were found between (a) volunteering versus no volunteering during unemployment, and (b) being unemployed versus being employed, we wish to underline that we are modeling *change* in these health, health behaviors and psychological well-being indicators. Therefore our observed results are most likely not due to the above-presented significant baseline differences.

Inferential Statistics

The estimated normal causation path model. Table 2 reports the standardized main and interaction effects of labor market status and voluntary work on health, health behaviors and psychological well-being. The model fitted the data well, $\chi^2(2) = 4.100$; RMSEA = 0.000; SRMR = 0.001; CFI = 1.000 and, TLI = 1.000 (Schermelleh-Engel, Moosbrugger, & Müller, 2003).

First, our results indicate that individuals who volunteered more hours per week during unemployment in 2010 did not have a significantly better self-rated health, were not less likely to smoke (i.e., binary part) or to consume less alcohol per day (i.e., intensity part) in 2012. Moreover, they were not significantly less likely to be diagnosed with diabetes type II, rheumatic disorder, musculoskeletal disorder, or mental disease. Next, they did not have a higher life satisfaction or feelings of self-realization, nor did they have fewer depressive symptoms and cognitive complaints. These results seem to partially reject hypothesis 1 in favor of hypothesis 2. However, they smoked significantly less cigarettes per day (i.e., intensity part), were significantly less likely to consume alcohol (i.e., binary part), and were significantly less likely to be diagnosed with hypertension in 2012. These results in turn seem to partially support hypothesis 1. When shedding more light on these complex results we first notice that unemployment—compared to employment—relates to worse self-rated health, a higher likelihood of smoking (i.e., binary part), a higher likelihood of consuming alcohol (i.e., binary part), an increased amount of alcoholic units consumed per day (i.e., intensity part), a higher likelihood of being diagnosed with a musculoskeletal disorder, a lower life satisfaction, fewer feelings of self-realization, more depressive symptoms, and more cognitive complaints. In contrast, engaging in more hours of voluntary work was found to decrease the amount of cigarettes smoked per day (i.e., intensity part), the likelihood of consuming alcohol (i.e., binary part), the likelihood of being diagnosed with hypertension and musculoskeletal disorder, and depressive symptoms in 2012. Engaging in more hours of voluntary work was moreover found to increase life satisfaction and feelings of self-realization for both employed and unemployed respondents. These results are in line with and partially support—for the amount of cigarettes smoked per day, the likelihood to consume alcohol, the likelihood to be diagnosed with hypertension and musculoskeletal disorder, and depressive symptoms—a psychosocial pathway perspective to health and well-being.

When focusing on the interaction effects we tend to conclude that although unemployment relates to several indicators of ill-health and well-being, engaging in more hours of voluntary work can only buffer some of the health behavior consequences of unemployment—that is for the likelihood of consuming alcohol and the amount of cigarettes smoked per day; thereby providing partial support for hypothesis 1. Although those who spend more hours as a volunteer during unemployment were also found to be less likely of being diagnosed with hypertension in 2012, there was no significant main effect of being unemployed on this health outcome. For all other outcomes, engaging in more hours of voluntary work does not seem to buffer the negative effects of unemployment; thereby providing partial support—that is for self-rated health, the likelihood to smoke, the amount of alcoholic units consumed per day, musculoskeletal disorder, life satisfaction, feelings of self-realization, depressive symptoms and cognitive com-

Table 2
Standardized Results From Normal Causation Path Model

Path	Estimate (SE)	<i>p</i>
Labor market status (LMS) → Dependent variable		
LMS (2010) → General self-rated health (2012)	-.15 (.05)	.002
LMS (2010) → Smoking behavior—binary part (2012)	.23 (.07)	.001
LMS (2010) → Smoking behavior—intensity part (2012)	.17 (.33)	.614
LMS (2010) → Alcohol consumption—binary part (2012)	.14 (.01)	<.001
LMS (2010) → Alcohol consumption—intensity part (2012)	.86 (.11)	<.001
LMS (2010) → Hypertension (2012)	-.44 (.30)	.146
LMS (2010) → Diabetes type II (2012)	-.61 (.63)	.328
LMS (2010) → Rheumatic disorder (2012)	-.49 (.39)	.205
LMS (2010) → Musculoskeletal disorder (2012)	.50 (.21)	.044
LMS (2010) → Mental disease (2012)	.84 (.63)	.183
LMS (2010) → Life satisfaction (2012)	-.20 (.05)	<.001
LMS (2010) → Self-realization (2012)	-.23 (.06)	<.001
LMS (2010) → Depressive symptoms (2012)	.15 (.05)	.005
LMS (2010) → Cognitive complaints (2012)	.14 (.05)	.008
Voluntary work (VW) → Dependent variable		
VW (2010) → General self-rated health (2012)	.09 (.05)	.085
VW (2010) → Smoking behavior—binary part (2012)	-.13 (.11)	.233
VW (2010) → Smoking behavior—intensity part (2012)	-.51 (.20)	.011
VW (2010) → Alcohol consumption—binary part (2012)	-.62 (.03)	<.001
VW (2010) → Alcohol consumption—intensity part (2012)	-.35 (.29)	.226
VW (2010) → Hypertension (2012)	-.76 (.12)	<.001
VW (2010) → Diabetes type II (2012)	-.58 (.35)	.100
VW (2010) → Rheumatic disorder (2012)	-.64 (.36)	.074
VW (2010) → Musculoskeletal disorder (2012)	-.86 (.15)	<.001
VW (2010) → Mental disease (2012)	.36 (.79)	.649
VW (2010) → Life satisfaction (2012)	.12 (.04)	.003
VW (2010) → Self-realization (2012)	.14 (.05)	.006
VW (2010) → Depressive symptoms (2012)	-.03 (.06)	.617
VW (2010) → Cognitive complaints (2012)	-.09 (.02)	.010
LMS × VW → Dependent variable		
LMS × VW (2010) → General self-rated health (2012)	.03 (.06)	.621
LMS × VW (2010) → Smoking behavior—binary part (2012)	-.07 (.12)	.574
LMS × VW (2010) → Smoking behavior—intensity part (2012)	.84 (.13)	<.001
LMS × VW (2010) → Alcohol consumption—binary part (2012)	-.15 (.01)	<.001
LMS × VW (2010) → Alcohol consumption—intensity part (2012)	.33 (.34)	.339
LMS × VW (2010) → Hypertension (2012)	-.53 (.21)	.010
LMS × VW (2010) → Diabetes type II (2012)	-.58 (.41)	.156
LMS × VW (2010) → Rheumatic disorder (2012)	.62 (.34)	.061
LMS × VW (2010) → Musculoskeletal disorder (2012)	.03 (.49)	.948
LMS × VW (2010) → Mental disease (2012)	.44 (.91)	.625
LMS × VW (2010) → Life satisfaction (2012)	.03 (.04)	.519
LMS × VW (2010) → Self-realization (2012)	.03 (.06)	.560
LMS × VW (2010) → Depressive symptoms (2012)	-.01 (.06)	.885
LMS × VW (2010) → Cognitive complaints (2012)	-.05 (.06)	.424

Note. *n* = 717. SE equals standard error.

plaints—for a materialistic pathway perspective in the onset of ill-health and well-being (in favor of hypothesis 2). This partial support for hypothesis 2 is motivated by the fact that there needs to be a significant main effect—on top of the nonsignificant interaction effect—between one's labor market status and the health and/or well-being indicator(s). In general these results seem to suggest that the effect of the amount of hours spend as a volunteer on health, health behavior and well-being is more of a additive as opposed to multiplicative.

Although this study focused on a measurement of exposure to voluntary work (i.e., the amount of hours spend volunteering), an alternative approach would be to focus on voluntary work (i.e., any amount of hours larger than zero) versus no voluntary work (i.e., zero hours of voluntary work). Adopting such an effect coded

dummy approach (voluntary work = 1 and no voluntary work = -1) provided us with a model that fitted the data to a lesser extent (BIC value is considerably higher: 51482.76 vs. 48321.54). In general, we obtained similar (i.e., the direction and significance of the results did not change) main effect results of one's labor market status on all health, health behaviors, and well-being indicators. In terms of the main effects of voluntary work on the outcomes, some differences were found depending on the measure of voluntary work used. When using the effect coded dummy approach, engaging in voluntary work (i.e., any amount of hours larger than zero) was found to be positively associated with a better self-rated health ($\beta = .29, p = .004$), negatively associated with the intensity of alcohol consumption ($\beta = -.15, p = .037$), and not associated with the likelihood of being diagnosed with

hypertension ($\beta = -.21, p = .300$). When looking at the interaction effects of one's labor market status and voluntary work (i.e., any vs. no voluntary work), we again found that most effects did not change (i.e., the direction and significance of the effects did not change). However, when using the effect coded dummy measure of voluntary work, we no longer found a significant interaction effect for the likelihood to be diagnosed with hypertension and the intensity of smoking behavior (i.e., the amount of cigarettes smoked per day). In general, this suggests that some of the beneficial health, health behavior, and psychological well-being effects of voluntary work are the consequence of simply engaging in voluntary work (i.e., any vs. no voluntary work), whereas other effects require one to engage in more hours of voluntary work per week.

The estimated reversed causation path model. Table 3 reports the main effects of one's health, health behaviors and psychological well-being (2010) on one's labor market status and voluntary work (2012). The reverse causation path model did not fit the data well, $\chi^2(188) = 2066.731$; RMSEA = 0.124; SRMR = 0.121; CFI = 0.028 and, TLI = -0.142 (Schermelleh-Engel et al., 2003).

Our results indicated that the likelihood of consuming alcohol (i.e., binary part) and one's life satisfaction in 2012 were respectively positively and negatively associated with being unemployed in 2012. Implying that those who are more likely to consume alcohol and/or are less satisfied with their life in 2010 are more likely to be unemployed in 2012. Moreover, feelings of self-

realization in 2010 were found to be associated with engaging in more hours of voluntary work in 2012. In sum these results indicate that for all—except the likelihood to consume alcohol and life satisfaction (for employment status) and feelings of self-realization (for voluntary work)—reverse causation is not likely to occur.

Discussion

The current study aimed to investigate whether engaging in voluntary work in times of unemployment has the potential to protect the unemployed from the detrimental health, health behaviors, and well-being consequences otherwise associated with unemployment. In this respect we juxtaposed a psychosocial and materialistic pathway perspective to health, health behavior, and well-being when investigating whether volunteering moderates the negative relationship between unemployment and one's health, health behavior, and well-being. More specifically, as an unemployed individual is deprived both from materialistic and psychosocial benefits of work, we are able to compare the relative importance of both perspectives in the onset of ill-health and ill-being. Moreover, we aimed to unravel whether this potential mitigating role of voluntary work is specific to particular dimensions of health, health behaviors and/or well-being indicators or can be considered to have a more general impact on health and well-being.

Table 3
Standardized Results From Reverse Causation Path Model

Path	Estimate (SE)	p
Health, health behavior and psychological well-being → Labor market status (LMS)		
General self-rated health (2010) → LMS (2012)	.02 (.11)	.882
Smoking behavior—binary part (2010) → LMS (2012)	.16 (.20)	.446
Smoking behavior—intensity part (2010) → LMS (2012)	.14 (.23)	.544
Alcohol consumption—binary part (2010) → LMS (2012)	.24 (.09)	.004
Alcohol consumption—intensity part (2010) → LMS (2012)	-.17 (.11)	.118
Hypertension (2010) → LMS (2012)	-.01 (.05)	.805
Diabetes type II (2010) → LMS (2012)	.06 (.07)	.414
Rheumatic disorder (2010) → LMS (2012)	.03 (.05)	.501
Musculoskeletal disorder (2010) → LMS (2012)	.05 (.07)	.487
Mental disease (2010) → LMS (2012)	-.09 (.08)	.207
Life satisfaction (2010) → LMS (2012)	-.37 (.13)	.005
Self-realization (2010) → LMS (2012)	.09 (.11)	.433
Depressive symptoms (2010) → LMS (2012)	.06 (.14)	.661
Cognitive complaints (2010) → LMS (2012)	-.01 (.13)	.913
Health, health behavior and psychological well-being → Voluntary work (VW)		
General self-rated health (2010) → VW (2012)	.18 (.14)	.211
Smoking behavior—binary part (2010) → VW (2012)	-.17 (.12)	.144
Smoking behavior—intensity part (2010) → VW (2012)	.39 (.25)	.122
Alcohol consumption—binary part (2010) → VW (2012)	.02 (.13)	.880
Alcohol consumption—intensity part (2010) → VW (2012)	.15 (.14)	.289
Hypertension (2010) → VW (2012)	.09 (.14)	.540
Diabetes type II (2010) → VW (2012)	-.07 (.09)	.450
Rheumatic disorder (2010) → VW (2012)	-.13 (.06)	.061
Musculoskeletal disorder (2010) → VW (2012)	.16 (.15)	.284
Mental disease (2010) → VW (2012)	-.02 (.08)	.841
Life satisfaction (2010) → VW (2012)	.31 (.22)	.151
Self-realization (2010) → VW (2012)	-.53 (.21)	.009
Depressive symptoms (2010) → VW (2012)	-.06 (.16)	.696
Cognitive complaints (2010) → VW (2012)	-.14 (.15)	.364

Note. $n = 717$. SE equals standard error.

Discussing the Results, Their Implications, and Alternative Explanations

The obtained results from our reversed causation model provide us with empirical evidence that unemployment and voluntary work were most likely to cause—rather than to result from—the observed changes in health, health behaviors and psychological well-being; thereby in contrast to suggestions and findings obtained by Böckerman and Ilmakunnas (2009); Hammarström and Janlert (2005) and Salm (2009). Nevertheless, an increased likelihood to consume alcohol and a lower life satisfaction related positively to an increased likelihood of being unemployed in 2012. Bacharach, Bamberger, and Biron (2010) found that alcohol consumption predicts workplace absenteeism, which in turn relates to an increased likelihood of becoming unemployed at a later point in time (Shoss & Penney, 2012). In a similar vein, it can be argued that those who are less satisfied with their lives will have an increased likelihood of becoming less committed to their organization and/or employment, to perform less well, and eventually leave their employment (Erdogan, Bauer, Truxillo, & Mansfield, 2012). These results are in line with metaanalytical research of Paul and Moser (2006) stating that both selection into unemployment because of ill-health, negative health behavior and/or impaired well-being as well as ill-health, maladapted health behavior and ill-being as a consequence of unemployment are valid. Nevertheless, Paul and Moser (2006) indicated that his selection effect is less common and effect sizes are rather small. Second, increased feelings of self-realization related positively to engaging in voluntary work in 2012. It seems evident that as one is less confident about himself/herself, (s)he will be less likely to take on new roles and responsibilities such as voluntary work. In general, these results indicate that it is most likely—except for the likelihood to consume alcohol and life satisfaction (for employment status) and feelings of self-realization (for voluntary work)—that unemployment and voluntary work cause the observed changes in health, health behaviors and psychological well-being.

Consequently, we feel generally confident to say that unemployed individuals who volunteered more hours per week—compared with those who did not volunteer—in 2010 were significantly less likely to smoke, to consume alcohol, and to be diagnosed with hypertension. Moreover they smoked significantly fewer cigarettes per day. These results seem to support hypothesis 1. For all other health, health behavior, and psychological well-being outcomes, no buffering effect of voluntary work in times of unemployment was found. Hence, these results—that is for self-rated health, the amount of alcoholic units consumed per day, musculoskeletal disorder, life satisfaction, feelings of self-realization, depressive symptoms, and cognitive complaints—support a materialistic pathway perspective to the onset of ill-health and ill-being. In other words, for these health, health behavior, and well-being indicators, engaging in more hours of voluntary work in times of unemployment does not seem to negate the detrimental health and well-being effects of being unemployed. Although this nonsignificant interaction effect was a necessary condition to provide support for the materialistic pathway hypothesis, it was not a sufficient condition. To support this hypothesis, there needs to be a nonsignificant interaction effect as well as a significant main effect between one's labor market status and the health, health behavior and/or well-being indicator(s). Our results indeed indi-

cated that being unemployed in 2010 was related to a worse self-rated general health, a higher likelihood to smoke (i.e., binary part), a higher likelihood to consume alcohol (i.e., binary part), an increased amount of alcoholic units consumed per day (i.e., intensity part), a lower life satisfaction, fewer feelings of self-realization, more depressive symptoms, and more cognitive complaints in 2012. These results are in line with findings of Reine et al. (2013; general self-rated health), Compton et al. (2014; smoking behavior and alcohol consumption), Melin et al. (2003, life satisfaction), Axelsson and Ejlertsson (2002; feelings of self-realization), Jefferis et al. (2011; depressive symptoms), and Weber et al. (2012; cognitive functioning). However, unemployment was unrelated to all but one (i.e., musculoskeletal disorder) protracted and/or serious illness indicators. A potential alternative explanation for this finding could be suggested when taking into account (a) that there were very few respondents (both employed and unemployed) who were diagnosed with these pathologies, and (b) that unemployment mainly influences one's affective experience (e.g., Griep, Baillien, Vleugels, Rothmann, & De Witte, 2013), which in turn adversely impacts one's perception of health and well-being. This in turn could explain why our results indicated that unemployment mainly affects self-rated health and psychological well-being. Nevertheless, being unemployed did increase the likelihood to be diagnosed with a musculoskeletal disorder. This finding can be understood in light of a recent study by Hauke, Flintrop, Brun, and Rugulies (2011). In their review of 54 longitudinal studies they found that occupational-related stressors, such as psychological distress caused by unemployment, most likely are at the root of musculoskeletal disorder due to an increased stress-related muscle tension.

Our study seems to provide (partial) support—that is for self-rated health, likelihood to smoke (i.e., binary part), likelihood to consume alcohol (i.e., binary part), amount of alcoholic units consumed per day (i.e., intensity part), likelihood to be diagnosed with a musculoskeletal disorder, life satisfaction, feelings of self-realization, depressive symptoms and cognitive complaints—for a materialistic pathway perspective in the onset of ill-being and ill-health (Creed & Macintyre, 2001; Creed & Bartrum, 2008; Fryer, 1986; Lynch et al., 2000; Price et al., 2002). Nevertheless, we wish to expound this point of view as engaging in more hours of voluntary work during unemployment was found to decrease (a) the likelihood to consume alcohol and (b) the amount of cigarettes smoked per day. Engaging in more hours of voluntary work per week was moreover found to be beneficial for one's life satisfaction and feelings of self-realization among both employed and unemployed individuals. Additionally, engaging in more hours of voluntary work was found to decrease the amount of cigarettes smoked per day (i.e., intensity part), the likelihood to consume alcohol (i.e., binary part), the likelihood to be diagnosed with hypertension and musculoskeletal disorder, and depressive symptoms in 2012. These additional effects of voluntary work positively influencing some indicators of psychological well-being contradict the materialistic pathway perspective as volunteering implies receiving no to little remuneration for the provided contribution and hence would be associated with an adverse influence on one's health and psychological well-being (Lynch et al., 2000). In this respect, a psychosocial pathway perspective (Marmot & Wilkinson, 2001) seems to provide a more realistic explanation as to why volunteering might be beneficial to one's health and psychological

well-being. These results were obtained when using a measurement of exposure to voluntary work (i.e., the amount of hours spend volunteering), however we also briefly mentioned the results from an alternative approach to the operationalization of voluntary work (i.e., an effect coded dummy approach with any vs. no voluntary work). Although in general the results remained the same (i.e., the direction and significance of the results did not change), some interesting nuances are worth discussing. The results seem to suggest that for general self-rated health it does not matter how many hours one engages in voluntary work (i.e., no significant relationship) but it does matter whether one engages in any voluntary work at all (i.e., positively related). On the other hand, the negative relationship with the likelihood to be diagnosed with hypertension was only present if one spends more hours on his or her voluntary activities.

In sum, as engaging in more hours of voluntary work in times of unemployment only buffers for some of the health behaviors (i.e., likelihood to consume alcohol and the amount of cigarettes smoked per day), it therefore seems to largely support a more materialistic pathway perspective. However, engaging in more hours of voluntary work seems beneficial for some of the health, health behavior, and psychological well-being indicators under study (thereby providing support for a more psychosocial pathway perspective). Consequently, integrating the materialistic perspective (Fryer, 1986; Lynch et al., 2000) and the psychosocial perspective (Jahoda, 1982; Marmot & Wilkinson, 2001) might provide a better explanation for the onset of ill-health and ill-being (e.g., Creed & Macintyre, 2001; Waters & Muller, 2003) among employed and unemployed individuals.

Discussing the Study's Context and Dropout Analysis

Discussing the study's context. When accounting for the high degree of participation in Sweden and the large amount of hours spend volunteering compared with other European countries, we deem it justified to conclude that the obtained results are to some extent an overestimation of what could be obtained in other Western countries with a lower average amount of hours spend on voluntary work. Specifically, as Swedish volunteers on average tend to spend a large amount of hours on their voluntary activities, they might benefit to a larger extent from the above-discussed health, health behavioral and well-being advantages of their voluntary work.

Discussing the dropout analysis. The dropout analysis showed that dropout between the 2010 SLOSH wave and the 2012 SLOSH wave could be explained by respondents' gender, age and the amount of hours they spend volunteering. Both the dropout effect of age and voluntary work (in hours per week) can be explained by the concept of conscientiousness, referring to the propensity to follow socially prescribed norms and rules, to control one's impulses, to plan ahead, to be goal-oriented, and to delay gratification (Srivastava, John, Gosling, & Potter, 2003). Both older respondents (i.e., people become more conscientious with age) and respondents who engage in voluntary work (i.e., engaging voluntary in activities that benefit society or the environment) may feel that is more socially prescribed to complete what has been started. Related to the dropout effect of gender, we found—in mimicry of Xenos, Pierrakeas, and Pintelas (2002) study on student dropout rates—that women are less likely to drop out once

they started something. Martin (1990) explains this finding based on the fact that a slight trend toward females as persisters has been observed frequently. When investigating how these drop-out characteristics could potentially influence the mitigating effect of voluntary work on smoking behavior and alcohol consumption, we believe that the obtained results may underestimate the population effects associated with these health behaviors as men (i.e., higher likelihood to dropout between both SLOSH waves) generally report higher rates of substance abuse (e.g., Martin, Neighbors, & Griffith, 2013). Moreover, we believe that the obtained results related to psychological well-being indicators (such as depressive symptoms and life satisfaction) may underestimate the population effects as older people—in general—tend to have better emotion regulation skills that focus more on the positive aspects in life (Carstensen, Fung, Charles, 2003; Charles, Reynolds, & Gatz, 2001).

Study Limitations

Despite some novel insights regarding the potential mitigating role of voluntary work in times of unemployment and the dimension specific (i.e., health behavior) protective effect of volunteering, some of the study's limitations need to be taken into consideration. First, although our theoretical arguments for the potential mitigating role of voluntary work in times of unemployment were based on insights from latent deprivation theory (Jahoda, 1982) and agency theory (Fryer, 1986), we did not explicitly measure the extent to which the unemployed felt that they were deprived from these latent and manifest functions of employment. Nor did we explicitly assess the extent to which one who engages in voluntary work has the perception that his or her voluntary activities fulfill the latent functions of employment as proxy for paid employment. We therefore recommend future research to explicitly measure the loss of latent and manifest function of employment among the unemployed and to adapt the existing scales so that measures of the latent benefits of voluntary work can be included. Some example items could be *to what extent does your voluntary work contribute to society?* or *to what extent does engaging in your voluntary work helps you to structure your time.*

Additionally, although we included more objective variables (diagnosed with a protracted and/or serious illness), the self-rated nature of the variables poses a number of methodological concerns, principally regarding common method variance and response bias. However, by relying on voluntary participation, ensuring total anonymity and collecting our independent variables (2010 SLOSH wave) separate in time from our dependent variables (2012 SLOSH wave), we believe we reduced the risks owing to common method and response bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Third, although several scholars proposed a linear decrease in health, health behavior, and psychological well-being as a function of the prolonged exposure to unemployment (Paul & Moser, 2009; Zapf, Dormann, & Frese, 1996), recent research of—among others—Griep et al. (2013) found no differences in psychological well-being when comparing short-term, long-term, and very long-term unemployment. However, we would like to advise future research to control for the duration of unemployment when investigating health, health behavior and well-being outcomes.

Next, although we used data from a Swedish nationally representative longitudinal cohort survey of the Swedish working population, those who decided to engage in voluntary work do not constitute a random sample of all unemployed respondents. However, we are unable to assess whether one's personality or motivation to engage in voluntary work could have impacted one's decision to volunteer in times of unemployment. Nonetheless, Mowen and Sujan (2005) consistently (i.e., over the course of three studies) found that altruism, the need for activity and learning, and the motive to help were predictors of one's engagement in voluntary work. It is hence advisable for future research to account for these factors when studying the effects of voluntary work on health, health behavior and well-being outcomes.

Fifth, although we used well-established instruments to measure the variables under study, we were unable to omit a 'frame shift' option in the comparisons respondents use when assessing these concepts after unemployment. Instead of thinking about, for example, their health in general, they might compare their health with the general health of those that are still being employed. Consequently, there might also be problems with floor and ceiling effects in the measurements of these concepts (Gunasekara, Carter, & Blakely, 2012). Therefore, it would be advisable for future research to include measures of self-assessed *change* in these concepts.

Finally, although we currently operationalized all health and well-being indicators as dependent variables, it could very well be the case that some of these dependent variables are to be considered mediating variables. For example, it might well be the case that smoking behavior mediates the relationship between one's labor market status and the likelihood of being diagnosed with hypertension.

Avenues for Future Research

Although the use of two waves of data allowed us to distinguish selection from causation effects (Thoits & Hewitt, 2001), it is advisable for future research to use three waves of data to explore underlying mechanisms and processes of voluntary work, such as the potential mediating role of psychological resources. For example, Midlarsky (1991) argued that volunteering increases one's feelings of confidence, which in turn generates positive emotions and cognitions. These positive emotions and cognitions have the potential to counter negative moods—such as depression—resulting from unemployment. By doing so, they suppress the "real" health or well-being effects of unemployment.

Similar, it is advisable for future research to investigate the role of continuous volunteering during unemployment versus episodic volunteering during unemployment as previous research (e.g., Vallerand, 2000) highlighted that continuous or sustained volunteering fosters the internalization of the voluntary activities, which in turn relates to a better health (Deci & Ryan, 2008). Furthermore, as Clary and colleagues (1998, 1999) argued that voluntary work has a potential indirect materialistic (i.e., career orientation and advancement) benefit, it could be fruitful to investigate if those who volunteered during unemployment during one wave indeed had an increased likelihood of finding new employment via their volunteering network during the next wave. Accounting for these aspects could strengthen the ability to assess the impact of volun-

teering versus nonvolunteering and of unemployment versus employment in the onset of health, health behavior and well-being.

Third, some of the health, health behaviors, and psychological well-being indicators might be impacted immediately or in the short term after becoming unemployed (e.g., feelings of self-realization, life satisfaction, alcohol consumption, or smoking behavior), whereas other—mainly protracted and/or serious illness or complaints—might require more time to manifest themselves as a consequence of becoming unemployed. It might therefore be harder for voluntary work to effectively mitigate these protracting and/or serious illness consequences of unemployment within a 2-year time span. Hence, we encourage future research to collect more longitudinal panel data including subjective and objective health, health behaviors, and well-being indicators to further our knowledge on the long-term health and well-being effects of unemployment and the potential mitigating role of voluntary work. On a related matter, collecting such longitudinal panel data has the additional advantage of having sufficient respondents/observations in each of the desired groups to examine the potential heterogeneity in the proposed relationships. Although Mohr and Otto (2011) and Paul and Moser (2006) gave no hint of a moderating effect of age in the relationship between unemployment and health outcomes, we nevertheless acknowledge that older respondents (i.e., significantly less likely to dropout between both SLOSH waves) have better emotion regulation skills and tend to focus more on positive events (e.g., Carstensen et al., 2003; Charles et al., 2001). Consequently, we could expect a weaker relationship between being unemployed and (some) psychological well-being indicators. Similar arguments can be made for heterogeneity when accounting for one's future time perspective at the labor market (often confounded by age). As employees tend to approach the legal retirement age and the accompanying social state pension, they might psychologically withdraw from the labor market by adjusting their ideas about the centrality of paid work (e.g., Ranchhod, 2006; Van Hooft et al., 2004). As a consequence, it has been demonstrated that indicators of health and psychological well-being tend to stop decreasing and were even found to recover to the levels usually found in employed samples (e.g., Warr & Jackson, 1987).

Finally, future research could benefit from including a much broader operationalization of the materialistic and psychosocial pathway perspective. Although this goes beyond the scope of the current study's interest when studying the impact of voluntary work on the relationship between unemployment conditions and health related outcomes, including more "economic" (e.g., state pensions) and "psychosocial" (e.g., social network support) variables increases the ability to account for the observed results.

Practical Implications

By further unraveling the potential mitigating role of voluntary work during unemployment, we have identified two important implications for policy in the field of voluntary work and unemployment regulations. First, those who spend more hours volunteering while unemployed were less likely to consume alcohol and smoked fewer cigarettes per day. They were moreover less likely to be diagnosed with hypertension. All of these indicators of ill-health and negative health behavior—otherwise positively as-

sociated with unemployment—are related to the onset of cardiovascular disease (CVD) and several types of cancer (Scarborough et al., 2011). The World Health Organization (2008) estimated that approximately 80% of CVD and over 33% over all cancers could be prevented by reducing or eliminating smoking and excessive alcohol consumption. In addition, smoking and alcohol consumption are related to a wide range of mental health disorders (i.e., cognitive complaints, feelings of depression, reduced life satisfaction). Consequently it can be concluded that these negative health behavior and hypertension have a broad impact on human lives (e.g., increased morbidity and early mortality via CVD and cancer), and are moreover associated with health care costs ranging between 3.85 and 5.52 billion dollar annually (Scarborough et al., 2011). Our results indicate that it is advisable to provide the unemployed with the opportunity to engage in voluntary work to benefit from the above-described health and health behavior effects. Echoing Callow (2004) we therefore recommend voluntary organizations highlight the appeal of volunteering when developing a recruitment and retention policy. Specifically, while organizations could benefit from displaying both the values of volunteering (i.e., contributing to society, being altruistic, reducing social isolation) as well as the potential health benefits (i.e., lower blood pressure, less substance abuse, lower mortality rates), volunteers themselves can benefit in terms of a better health and health behaviors. It can therefore be concluded that motivating the unemployed to volunteer is a perfect prescription for one's health promotion and maintenance.

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Received April 30, 2014

Revision received August 18, 2014

Accepted October 3, 2014 ■