

Socially Productive Activities, Reciprocity and Well-Being in Early Old Age: Gender-Specific Results from the English Longitudinal Study of Ageing (ELSA)

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Abstract This study explores the associations between reciprocity in socially productive activities, such as volunteering and caring for someone and well-being (evaluative and experienced), separately for men and women in the years leading up to State Pension Age. We investigate the stability of our associations by examining cross sectional and longitudinal associations, with outcomes assessed 2 years later. The sample comes from the second and third wave of the English Longitudinal Study of Ageing (ELSA); we selected 4,052 respondents who were below State Pension Age at wave 2, i.e. aged between 52 and 64. Evaluative well-being was measured using quality of life and experienced well-being was measured using depressive symptoms. Baseline regression analyses adjusted for confounders showed that reciprocity in volunteering was associated with higher quality of life and lower odds of being depressed for both men and women. Non-reciprocity in caring was strongly associated with poorer quality of life and with higher odds of having depressive symptoms for women but not for men. From longitudinal analyses adjusted for baseline confounders we found that among men, non-reciprocity in caring and volunteering (at baseline) was associated with decreased quality of life and with higher odds of having depressive symptoms (at follow-up); among women non-reciprocity in caring (at baseline) and reciprocity in volunteering (at baseline) were not associated with decreased quality of life 2 years later. These findings suggest that in the years leading up to State Pension Age there might be important gender differences, not previously explored, in perceived reciprocity for those engaged in volunteering and in caring that have important consequences for evaluative and experienced well-being.

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Introduction

The rapid ageing of populations in the developed world makes participation in socially productive activities a policy-relevant subject for investigation. On the one hand, the ageing of populations is viewed as potentially leading to dependency crises (Jackson and Howe 1999), which may be ameliorated by the participation of older people in socially productive activities such as caring and volunteering. The UK government defined the caring work and voluntary work done by older people as of crucial benefit for the nation (Department of Social Security 2000). In addition, studies of elderly populations have shown that socially productive activities lower the risk of all-cause mortality (Glass et al. 1999; Menec 2003) and are associated with improved health outcomes (Bath and Deeg 2005), survival (Maier and Klumb 2005) and happiness (Menec 2003).

The activity theory of ageing suggests that engagement in social activities (formal and informal) contributes positively to the life satisfaction of older individuals (Longino and Kart 1982). However, there are different socially productive activities in which old people can engage and the different nature of the activity can have a different effect on well-being. In a empirical application of activity theory, Longino and Kart (1982) found that while informal activity (with friends, relatives and neighbours) contributed positively to the life satisfaction, formal activity (participation in voluntary associations) had a negative effect on life satisfaction. A possible explanation given by the author for the inverse association between formal activity and life satisfaction was that if formal activities are settings that potentially expose the older persons to negative and unsupportive relationships in which self-concept is not reinforced, then life satisfaction declines (Longino and Kart 1982). These findings emphasise the need for more research on the mechanisms underlying the relationship between well-being and socially productive activities. However, to date these mechanisms have not been extensively researched. Herzog and House (1991) suggest that socially productive activities such as voluntary work can provide people with a sense of usefulness and capability; it is possible that this sense of usefulness mediates the benefits of the activities.

More recently, Siegrist et al. (2004:10) argued that “social productivity may be conceptualised as an interpersonal social exchange based on the principle of reciprocity”. This principle is an extension of the theory of effort-reward imbalance first developed in relation to paid work (Siegrist, 1996; Marmot et al. 2006). In social productivity, the effort of doing the activity is made in anticipation of an equivalent reward that reflects the value of the effort involved. An effort-reward imbalance in social productivity in the long run adversely affects the well-being as this experience elicits strong negative emotions. This suggests that examining the quality of exchange in socially productive activities is crucial in terms of the well-being of those involved (Siegrist et al. 2004). Indeed, a recent study (Wahrendorf et al. 2006) has shown that the association between well-being and socially productive activities, such as volunteering, caring and informal help, varies according to whether individuals received adequate appreciation from the activity (reciprocity), with greater reciprocity positively associated with well-being (Wahrendorf et al. 2006). In a previous study

we explored participation in socially productive activities, reciprocity and well-being in a post-retirement age population in England (McMunn et al. 2009). We found that carers and volunteers who felt adequately rewarded for their activities had better well-being than those who were not participating in those activities, underlying the importance of reciprocal exchange in social engagement for well-being in later life. Although these findings are important in understanding the quality of socially productive activities, they are limited by the cross-sectional nature of the data. A recent study using prospective data showed that in early old age continued participation in socially productive activities, in particular those that offer opportunities for reciprocal exchange, improved prospective quality of life (Siegrist and Wahrendorf 2009). However, previous studies have not addressed the issue separately for men and women. It has been shown that among older people, there are gender differences in caring and volunteering (McMunn et al. 2009; Wahrendorf et al. 2006), but to date it is still not known whether the association between well-being and reciprocity in socially productive activities differs by gender in early old age. It may be that the years leading up to State Pension Age are crucial for understanding older people's engagement in socially productive activities, because it is at this point that individuals may be setting in train the activities that they will engage in later in their lives. This is also likely to be a period characterised by multiple demands on people's time—caring for both younger and older family members, paid work, and running a home—that need to be balanced with opportunities for wider engagement in civic activities, such as volunteering. Furthermore, this is a time when engagement with work changes, opening up the opportunity to engage in socially productive activities. Therefore it is crucial to understand whether engagement in socially productive activity involve reciprocity and its impact on well-being.

Furthermore, current debates about well-being suggest that it is a multifaceted concept from which three aspects can generally be distinguished: evaluative well-being, experienced well-being and eudemonic well-being (Dolan et al. 2011; Kahneman, and Krueger 2006). It is therefore important to measure these aspects of well-being separately to develop a broader appreciation of people's lives.

The aim of this study is to explore the associations between the exchange characteristics of socially productive activities, such as volunteering and caring for someone and evaluative well-being, measured by quality of life and experienced well-being measured by depressive symptoms, separately for men and women in the years leading up to State Pension Age. We hypothesise that experienced reciprocity in performing socially productive activities is associated with better well-being in early old age. We investigate the stability of our associations by examining cross sectional associations and longitudinal associations, with outcomes assessed 2 years later.

Methods

Data

The data are from the second and third wave of the English Longitudinal Study of Ageing (ELSA), a panel study where the same individuals are followed and re-interviewed every 2 years. The technical details of this study and the results of

primary analyses have been published elsewhere (Marmot 2003; Banks et al. 2006, 2008; Steptoe et al. 2012) and are also available at the web site of the Institute of Fiscal Studies (<http://www.ifs.org.uk/elsa/>). Briefly the ELSA sample was drawn from people who had taken part in the Health Survey for England (HSE) in 1998, 2000 or 2001 and were born before March 1952. The HSE samples are selected to be representative of people living in private households in England. A total of 11,391 sample members took part in wave 1 (2002–2003) giving a response rate of 67% of those eligible; at wave 2 (2004–2005) there were 8,688 respondents (response rate 82%), and at wave 3 (2006–2007) there were 7,114 respondents (response rate 73%). We use respondents who were below State Pension Age at wave 2, i.e. aged between 52 and 64, giving a total sample of 4,052. Participants gave their informed consent to take part in the study. Ethical approval for ELSA was given by the London Multi-centre Research Ethics Committee.

Measures of Well-being

Evaluative well-being has been measured using CASP19, an instrument specifically designed for measuring quality of life at early old age, the (Hyde et al. 2003). The measure contains 19 items covering four conceptual domains of individual needs that are particularly relevant in later life: Control, Autonomy, Self-realization and Pleasure. The instrument has four items for the control domain and five for the others. Each item is measured on a four-point Likert scale, to assess the degree to which each aspect applies to the respondent (rated ‘this applies to me: often, sometimes, not often, never’). For the analyses presented here we used a summary score covering all of the items from the CASP19 (range 0 to 57 with higher scores indicating better quality of life). This score was obtained as the arithmetic sum of the scores for all the 19 items (Cronbach’s $\alpha=0.67$). In terms of size of effects, a reduction of around 7 quality of life points is associated with having a limiting long-standing illness compared to those without (Netuveli et al. 2006). The psychometric properties of CASP19 are fully described by Hyde et al. (Hyde et al. 2003), while Wiggins et al. (2008) evaluated the properties of CASP19 using data from the English Longitudinal Study of Ageing (ELSA).

Experienced well-being has been measured using the 8-item shortened version of the Centre for Epidemiologic Study Depression Scale (CES-D) (Radloff 1977) with binary answers. The full CES-D has been widely used in both clinical and non-clinical settings (Carnethon et al. 2007; Hirvensalo et al. 2007). The questions asked the degree to which the respondent had experienced depressive symptoms over the past month. The total score ranges from 0 to 8, which was dichotomised, with score greater than or equal 3. The use of a cut-off point of three or more depressive symptoms to indicate symptomatic depression is in line with previous studies that have used this abridged version of the scale (Steffick 2000).

Measures of Socially Productive Activities and Reciprocity

Respondents were asked whether or not during the past month they were engaged in volunteering and/or caring for someone. The level of reciprocity experienced from these activities was measured. Participants were asked the following: “Considering

all the efforts that I have put into my [activity], I always received adequate appreciation from others". The response options were "Strongly agree", "Agree", "Disagree" and "Strongly disagree". Participants who disagreed or strongly disagreed were considered not to feel adequate reciprocity for their caring or volunteering activity, because an imbalance was perceived between the "cost" and the "gains" of their engagement (Wahrendorf et al. 2006). This approach allowed us to code caring and volunteering as: "No activity", "Reciprocal activity" "Non-reciprocal activity".

Covariates

Information regarding age, gender, marital status, employment status, and total wealth were included in the analyses. Employment status was dichotomised as currently in paid employment (or not). From the questions on marital status we derived a dichotomous variable for cohabiting status, defined as currently living with a partner (or not). Total wealth (excluding pension) was defined as financial, plus physical (such as business wealth, land or jewellery), plus housing wealth, minus debts. For the purpose of this analysis we used quintiles of total wealth. A variable assessing presence of a self-perceived 'limiting longstanding illnesses' was derived from the answers to two questions: whether the informant had any longstanding illness that affected them over a period of time; if so, whether it limited their activities in any way. These factors were selected as relevant to the well-being outcomes included in the analyses and to the socially productive activities (McMunn et al. 2009).

Statistical Analysis

Descriptive analyses were used to report, for each gender, the prevalence of socio-demographic characteristics, mean quality of life scores, the prevalence of depressive symptoms and engagement in socially productive activities. We used linear regression to analyse the baseline associations (2004–05) between perceived reciprocity in caring and in volunteering (included simultaneously in the models) and quality of life, while we used logistic regression for depressive symptoms. Using interaction terms we tested whether the relationship between well-being and reciprocal exchange in each activity varies by gender. Most of the interactions were significant, therefore each model was run separately for men and women and adjusted for age, total wealth, limiting longstanding illness, employment status and cohabiting status.

To analyse the longitudinal relationship between perceived reciprocity in socially productive activities and well-being, we fitted autoregressive models in which the value of the outcome variable at follow up is related not only to the value of the predictor variable at baseline (2004–05), but also to the outcome variable at baseline (wave 2). Autoregressive models help to "remove" the cross-sectional part of the relationships, in order to estimate the real influence of the predictor variables on the outcome variables. Linear regression was used for quality of life, while logistic regression for depressive symptoms; the models were adjusted for baseline characteristics.

As in all longitudinal studies, the survey is subject to attrition and other form of non-response. To handle missing data we used full information maximum

likelihood (FIML) estimation, which computes parameter estimates on the basis of all available data, including the incomplete cases. The computation process for obtaining the final estimates operates as if missing data are “replaced” with predicted scores obtained via the relations among the variables used in the analysis. Missing data are not imputed; the predicted scores are only used during the maximum likelihood method for obtaining final estimates (Enders 2001). FIML tends to be less biased than either listwise or pairwise deletion methods when missing data are missing at random data (MAR) (Arbuckle 1996; Enders and Bandalos 2001; Wothke 2000) and others have also suggested when data are missing not at random (MNAR) (Enders 2001; Wiggins and Sacker 2001). The regressions analyses models accounted for the complex survey design and weighted simultaneously for non-response to make the ELSA sample representative of the population of adults aged 50 and over in England, living in private household in 2001; models were fitted using Mplus v5.1 software package (Muthén and Muthén 2007).

Results

Table 1 reports baseline characteristics of the sample by gender. The mean age of men and women did not differ significantly. Women had higher quality of life than men; however, they were more likely than men to be depressed and to report a limiting longstanding illness ($p < 0.001$). Men were more likely than women to be in paid work and to be living with a partner (either married or cohabiting) ($p < 0.001$). Distributions across wealth quintiles were similar by gender. Higher percentages of women than men were engaged in caring for someone; while there were not gender differences in engagement in voluntary work.

Table 1 Sample characteristics at baseline, England 2004–05

	Men	Women
% (N)	48.9(1,853)	51.1(2,199)
Mean Age (SD)	57.8(4.3)	57.9(4.7)
Mean Quality of Life (SD)	42.7(8.6)	43.6(8.5)
% Depressive symptoms	18.7	24.0
% Voluntary work	9.1	9.0
% Caring for someone	8.6	18.7
% Limiting longstanding illness	27.8	30.9
% In paid employment	66.1	50.2
% Cohabiting with a partner	82.2	76.8
% Quintile of total wealth		
Poorest	17.2	17.4
2nd	18.9	20.3
3rd	19.6	20.0
4th	22.0	19.9
Richest	22.3	22.4

Table 2 shows the regression results for the association between reciprocity in socially productive activities and well-being at baseline, separately for men and women. Among men there was not a significant association between reciprocity in caring and either quality of life or depressive symptoms. Compared with men who were not involved in any voluntary work, reciprocity in volunteering was associated with higher scores of quality of life and with lower odds of having depressive symptoms. Among women, non-reciprocity in caring, compared with not caring, was associated with lower in quality of life score of 5.7 (95%CI:-8.63;-2.75) and with higher odds of being depressed. Reciprocity in voluntary work (compared to those who were not volunteering), was positively associated with quality of life and decreased odds of being depressed (Table 2).

Table 3 reports the results for the association between reciprocity in socially productive activities at baseline and experienced and evaluative well-being 2 years later, adjusted for outcomes at baseline as well as baseline characteristics. Among men, the main difference between results from longitudinal analysis and those from cross-sectional was that non-reciprocity in caring (at baseline) was associated with lower quality of life and with higher odds of being depressed 2 years later. While, non-reciprocity in volunteering was associated with a decrease in quality of life 2 years later of 3.3 points (95%CI:-5.18;-1.37).

Table 2 Regression results for the baseline association between reciprocity in socially productive activities and well-being, by gender England 2004–05

	Quality of Life			Depressive symptoms		
	Unstand. Regr coef.	95% CI	<i>p</i>	Odds ratios	95% CI	<i>p</i>
Men						
Caring						
None	0			1		
Reciprocal activity	0.335	1.164;1.834	0.662	1.017	0.631;1.641	0.944
Non-reciprocal activity	-0.168	-3.159;2.823	0.912	2.361	0.822;6.777	0.111
Voluntary work						
None	0			1		
Reciprocal activity	2.862	1.602;4.122	0.000	0.381	0.197;0.736	0.004
Non-reciprocal activity	0.298	-2.136;2.732	0.810	2.130	0.722;6.283	0.171
Women						
Caring						
None	0			1		
Reciprocal activity	-0.929	-1.874;0.016	0.054	0.812	0.594;1.111	0.194
Non-reciprocal activity	-5.690	-8.630;-2.750	0.000	2.565	1.394;4.719	0.002
Voluntary work						
None	0			1		
Reciprocal activity	2.158	1.033;3.283	0.000	0.629	0.397;0.997	0.048
Non-reciprocal activity	-0.292	-3.383;2.799	0.853	1.419	0.531;3.796	0.486

Adjusted for age, limiting longstanding illness, total wealth, employment status, cohabiting status

Among women, the main difference between results from longitudinal analysis and those from cross-sectional was that non-reciprocity in caring and reciprocity in volunteering were not associated with decreased quality of life 2 years later.

Discussion

In this study of men and women in the years before State Pension Age we investigated the relationships between the reciprocal nature of socially productive activities and two distinct measures of well-being: quality of life and depressive symptoms. Baseline analyses showed that reciprocity in volunteering was associated with higher quality of life and lower odds of being depressed for both men and women, findings that are consistent with previous studies (McMunn et al. 2009; Wahrendorf et al. 2006). Non-reciprocity in caring was strongly associated with poorer quality of life

Table 3 Regression results for the longitudinal association between reciprocity in socially productive activities and well-being, by gender England (2004–05 to 2006–08)

	Quality of Life			Depressive symptoms		
	Unstand Regr coef.	95% CI	<i>p</i>	Odds ratios	95% CI	<i>p</i>
Men						
Caring						
None	0			1		
Reciprocal activity	-0.654	-1.901;0.593	0.304	1.039	0.584;1.848	0.896
Non-reciprocal activity	-3.253	-6.383;-0.123	0.042	4.349	1.688;11.209	0.002
Voluntary work						
None	0			1		
Reciprocal activity	-0.013	-1.001;0.975	0.979	0.330	0.135;0.804	0.015
Non-reciprocal activity	-3.275	-5.178;-1.372	0.001	0.435	0.105;1.795	0.250
Women						
Caring						
None	0			1		
Reciprocal activity	-0.334	-21.149;-0.481	0.422	0.982	0.687;1.403	0.920
Non-reciprocal activity	-0.809	-1.237;2.855	0.438	2.809	1.363;5.791	0.005
Voluntary work						
None	0			1		
Reciprocal activity	0.276	-0.682;1.234	0.572	0.449	0.236;0.855	0.015
Non-reciprocal activity	-0.768	-3.275;1.739	0.548	0.612	0.1682;12.059	0.427

Adjusted for age, limiting longstanding illness, total wealth, employment status, cohabiting status and outcome variables at baseline

and with higher odds of having depressive symptoms for women but not for men. Previous studies also found that non-reciprocity in caring is associated with lower quality of life (McMunn et al. 2009; Wahrendorf et al. 2006) and with higher risk of depression (Wahrendorf et al. 2006), however the results were not presented separately for men and women.

From longitudinal analyses (which removed the cross-sectional part of the relationships) we found that among men, non-reciprocity in caring (at baseline) was associated with decreased quality of life and with higher odds of being depressed 2 years later; while, non-reciprocity in volunteering was associated with decreased quality of life 2 years later. Results from the Survey of Health, Ageing and Retirement in Europe did not find an association between reciprocal exchange in caring and prospective quality of life (Siegrist and Wahrendorf 2009). A possible explanation for these new relationships is that perceiving an imbalance between the effort spent in the activity and the reward gained elicits negative emotions, which have stronger effects on the well-being of men in the long run rather than in the short-term. Interestingly, among women non-reciprocity in caring (at baseline) and reciprocity in volunteering were not associated with decreased quality of life 2 years later.

This suggests that in the short term there might be gender differences in the nature of the quality of exchange in caring, or perhaps in the types of support available to male and female carers. While it is well known that women are more likely than men to be engaged in caring for someone (McMunn et al. 2009; Wahrendorf et al. 2006; Wahrendorf et al. 2008) and that their quality of life is reduced by being a carer (Netuveli et al. 2006), what happens among men is less clear. It is possible that for men only in the long term caring for someone or volunteering may represent a burden especially if carried out without reciprocity and at the same time with other activities, such as paid employment and domestic labour meaning also that the beneficial effects of reciprocity might no longer be perceived. It is also possible that women are more able to cope with the long term effect of caring and therefore more likely to adjust to the adverse effect of experiencing non-reciprocity than men.

The present analysis has several strengths. First, it uses cross-sectional and longitudinal data from a large population-based sample of people in the years before State Pension Age. Second, we were able to use a theoretically grounded measure of quality of life which was specifically designed for early old age (CASP19). The measure has been developed to take account of the need for a definition of quality of life that is distinct from the factors that influence it, such as health or income (Blane et al. 2004). Third, our measures of engagement in socially productive activities allowed us to cover a number of dimensions, and to examine whether the activity carried reciprocity for the respondent, or not. Fourth, we were able to examine gender differences, and to show important findings that have not been reported elsewhere. The depth of data collection in the study allowed us to include a number of important covariates in the analyses we conducted.

A possible limitation of this study is that all data were self-reported; therefore it might be that our results are affected by report bias or it might be possible that respondents with a negative mood state or trait are more likely to report non-reciprocity in their activities.

Another potential limitation of our study is selection bias during follow-up. In order to minimize the potential bias derived from attrition and non-response, we used

full information maximum likelihood estimation, which computes parameter estimates on the basis of all available data, including the incomplete cases. Lastly, the measure of reciprocal exchange was rather crude. Ideally, a more detailed measurement approach should have been used in order to weigh rewards against efforts (Siegrist and Wahrendorf 2009).

In conclusion, our study contributes to a better understanding of the relationships between evaluative and experienced well-being and reciprocity in socially productive activities in men and women in the years leading up to State Pension Age. We found that there are important gender differences in perceived reciprocity for those engaged in volunteering and in caring that have important consequences for well-being. We also point out the need to differentiate between socially productive activities, in particular to consider caring separately from other activities, especially in terms of the well-being of female carers. In terms of policy, these findings reinforce the importance of not only facilitating opportunities for engagement in socially productive activities, but also of seeking conditions that maximise the sense of reward people feel.

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References

- Arbuckle, J. L. (1996). Full estimation information in the presence of incomplete data. In G. A. Marcoulides & R. E. Shumaker (Eds.), *Advanced structural equation modelling: Issues and techniques* (pp. 243–277). Mahwah: Erlbaum.
- Banks, J., Breeze, E., Lessof, C., & Nazroo, J. (2006). *Retirement, health and relationships of the older population in England: The 2004 English longitudinal study of ageing*. London: The Institute for Fiscal Studies.
- Banks, J., Breeze, E., Lessof, C., & Nazroo, J. (2008). *Living in the 21st century: older people in England: The 2006 English longitudinal study of ageing (Wave 3)*. London: The Institute for Fiscal Studies.
- Bath, P. A., & Deeg, D. (2005). Social engagement and health outcomes among older people: introduction to a special section. *European Journal of Ageing*, 2, 24–30.
- Blane, D., Higgs, P., Hyde, M., & Wiggins, R. D. (2004). Life course influences on quality of life in early old age. *Social Science in Medicine*, 58, 2171–2179.
- Carnethon, M. R., Biggs, M. L., Barzilay, J. I., et al. (2007). Longitudinal association between depressive symptoms and incident type 2 diabetes mellitus in older adults: the cardiovascular health study. *Archives of Internal Medicine*, 167, 802–7.
- Department of Social Security. (2000). *Life begins at 50: A better society for older people*. London: DSS.
- Dolan, P., Layard, R., & Metcalfe, R. (2011). Measuring subjective well-being for public policy. London: Office for National Statistics. <http://cep.lse.ac.uk/pubs/download/special/cepsp23.pdf> accessed on June 2012.
- Enders, C. K. (2001). The performance of the full information maximum likelihood estimator in multiple regression models with missing data. *Educational and Psychological Measurement*, 61, 713–40.
- Enders, C. K., & Bandalos, D. L. (2001). The relative performance of maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*, 8, 430–457.
- Glass, T. A., de Leon, C. M., Marottoli, R. A., & Berkman, L. F. (1999). Population based study of social and productive activities as predictors of survival among elderly Americans. *BMJ*, 319, 478–483.

- Herzog, A. R., & House, J. S. (1991). Productive activities and ageing well. *Generations*, 15, 49–54.
- Hirvensalo, M., Sakari-Rantala, R., Kallinen, M., Leinonen, R., Lintunen, T., & Rantanen, T. (2007). Underlying factors in the association between depressed mood and mobility limitation in older people. *Gerontology*, 53, 173–8.
- Hyde, M., Wiggins, R. D., Higgs, P., & Blane, D. B. (2003). A measure of quality of life in early old age: the theory, development and properties of a needs satisfaction model (CASP-19). *Ageing & Mental Health*, 7, 186–194.
- Jackson R and Howe N. (1999) *Global Aging*, Center for strategic and international studies Watson Wyatt Worldwide. http://www.csis.org/component/option,com_csis_pubs/task,view/id,892/ Accessed 12 March 2007.
- Kahneman, D., & Krueger, A. B. (2006). Developments in the measurement of subjective well-being. *Journal of Economic Perspectives*, 20(1), 3–24.
- Longino, C. F., Jr., & Kart, C. S. (1982). Explicating activity theory: a formal replication. *Journal of Gerontology*, 37, 713–722.
- Maier, H., & Klumb, P. L. (2005). Social participation and survival at older ages: is the effect driven by activity content or context? *European Journal of Ageing*, 2, 31–39.
- Marmot, M. G. (2003). *Health, wealth and lifestyles of the older population in England: The 2002 english longitudinal study of ageing*. London: Institute for Fiscal Studies.
- Marmot, M., Siegrist, J., & Theorell, T. (2006). Health and the psychosocial environment at work. In M. Marmot & R. Wilkinson (Eds.), *Social determinants of health* (2nd ed., pp. 97–130). Oxford: Oxford University Press.
- McMunn, A., Wahrendorf, M., Nazroo, J., Breeze, E., & Zaninotto, P. (2009). Participation in socially productive activities, reciprocity and wellbeing in later life: baseline results in England. *Ageing and Society*, 29, 765–782.
- Menec, V. H. (2003). The relation between everyday activities and successful aging: a 6-year longitudinal study. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, 58, S74–S82.
- Muthén, L. K., & Muthén, B. O. (2007). *Mplus user's guide* (5th ed.). Los Angeles: Muthén & Muthén.
- Netuveli, G., Wiggins, R. D., Hildon, Z., Montgomery, S. M., & Blane, D. (2006). Quality of life at older ages: evidence from the English longitudinal study of ageing (wave 1). *Journal of Epidemiology and Community Health*, 60, 357–363.
- Radloff, L. S. (1977). The CES-D scale: a self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Siegrist, J. (1996). Adverse health effects of high-effort/low-reward conditions. *Journal of Occupational Health Psychology*, 1, 27–41.
- Siegrist, J., & Wahrendorf, M. (2009). Quality of work, health, and retirement. *Lancet*, 374, 1872–1873.
- Siegrist, J., von dem Knesebeck, O., & Evan Pollack, C. (2004). Social productivity and well-being of older people: A sociological exploration. *Social Theory & Health*, 2, 1–17.
- Steffick DE. (2000) *Documentation of affective functioning measures in the Health and Retirement Study*. Ann Arbor: HRS Health Working Group/AHEAD Documentation Report DR-005.
- Stepoe A, Breeze E, Banks J, Nazroo J. (2012 Nov 9). Cohort Profile: The english longitudinal study of ageing. *International Journal of Epidemiology*. [Epub ahead of print]
- Wahrendorf, M., von dem Knesebeck, O., & Siegrist, J. (2006). Social productivity and well-being of older people: baseline results from the SHARE study. *European Journal of Ageing*, 3, 67–73.
- Wahrendorf, M., Ribet, C., Zins, M., & Siegrist, J. (2008). Social productivity and depressive symptoms in early old age—results from the GAZEL study. *Ageing & Mental Health*, 12(3), 310–316.
- Wiggins, R. W., & Sacker, A. (2001). A comparative evaluation of strategies to handle missing data in the context of structural equation modelling: a user's perspective. In G. Marcoulides & I. Moustaki (Eds.), *Latent variable and latent structure models* (pp. 105–120). New Jersey: Lawrence Erlbaum Associates.
- Wiggins, R. D., Netuveli, G., Hyde, M., Higgs, P., & Blane, D. B. (2008). The Evaluation of a Self-enumerated Scale of Quality of Life (CASP-19) in the context of research on ageing: a combination of exploratory and confirmatory approaches. *Social Indicators Research*. doi:10.1007/s11205-007-9220-5.
- Wothke, W. (2000). Longitudinal and multigroup modelling with missing data. In T. D. Little, K. U. Schnabel, & L. Baumert (Eds.), *Modeling longitudinal and multiple group data: Practical issues, applied approaches and specific examples* (pp. 219–240). Hillsdale: Erlbaum.