The effect of roles prescribed by active ageing on quality of life across European regions

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Abstract

The active ageing approach supports a set of roles or activities that are supposed to be beneficial for older adults. This paper reassesses the benefits of activities for the quality of life by (a) analysing many activities at the same time to control each other, (b) using panel data to detect the effects of activities over time, and (c) performing separate analyses for four European regions to test the context-specificity of the effects. The effects of roles in later life are tested on panel data from three waves of the Survey of Health, Ageing and Retirement in Europe (SHARE) project. The results of fixed-effects regression show that only some activities – volunteering, participating in a club and physical activity – increase the quality of life, and that care-giving within the household has the opposite effect. Moreover, the beneficial effects are much weaker and less stable than the other types of regression suggest; they are beneficial only in some regions, and their effect is much weaker than the effects of age, health and economic situation. Therefore, the active ageing approach and activity theory should reflect the diverse conditions and needs of older adults to formulate more-context-sensitive and less-normative policy recommendations.

Keywords: roles; older age; active ageing; quality of life; social norms; causality

Introduction

Promoting employment and social participation amongst older people is the dominant reaction to population ageing both in the academic sphere and in social policies. A higher level of productive social roles consisting of regular activities in later life is usually presented as a generally beneficial solution to challenges connected with population ageing (overload of social and health systems, poor health and lower quality of life (QoL)). Moreover, these challenges would be addressed to both older adults in the form of personal conditions improvement and society through more paid and unpaid work being done (Walker and Maltby, 2012; Timonen, 2016; Marsillas *et al.*, 2017). Participation in society in later life is beneficial to older people themselves. For older people, social participation has an enhancing effect on their physical health (Thomas, 2011, 2012), mental

health (Engelhardt *et al.*, 2010; Olesen and Berry, 2011) and life satisfaction (Gergen and Gergen, 2006; Adams *et al.*, 2011; Potočnik and Sonnentag, 2013), mitigating also the intergenerational conflict in a society (Hess *et al.*, 2017).

The notion of activities as a way to make population ageing sustainable and even beneficial has been the main assumption of the 'activity theory' (Havighurst, 1961) and the concept of active ageing (Walker, 2002). Since the active ageing approach has been built on the assumptions of the activity theory and both approaches expect prevalently positive outcomes of activities in later life, this study tests the assumptions of both approaches whilst referring mostly to the more recent and influential active ageing approach. In large part, the concept of active ageing was developed by the World Health Organization (WHO, 2002) and the European Union (EU) (Commission of the European Communities, 2002). Whilst the active ageing approach has been dominating the European and other geographical contexts, a similar meaning is connected to successful ageing influential in the United States of America, which also aims for more healthy and engaged later life through high social activity (Havighurst, 1961; Phillips *et al.*, 2010; Rowe and Kahn, 2015).

The paper mainly aims to assess the impact on the subjective QoL of activities supported by the active ageing approach while controlling for other roles and external conditions. The analysis of the Survey of Health, Ageing and Retirement in Europe (SHARE) follows changes in employment, social participation, physical activities and care-giving over time and their effect on the QoL whilst controlling for each other. In this way, the study identifies the independent utility of the activities for older adults' QoL controlling for other activities in the same models.

Activities supported by the active ageing approach and their expected outcomes

Activities encompassed by active ageing differ by the information source, but the EU mainly supports prolonged employment, participation in society and independent living. The category 'participation in society' includes care-giving, volunteering, lifelong learning and political activities (EU Council, 2012; Eurostat, 2012). This diverse list of activities is connected by their presumed utility for both individuals (Walker, 2009; Adams *et al.*, 2011; European Commission, 2013; Marsillas *et al.*, 2017) and society (EU Council, 2012; European Commission, 2013; Foster and Walker, 2015). This study tests their utility, which is not supported conclusively because specific activities have different consequences for the QoL in different economic, institutional and cultural contexts (Adams *et al.*, 2011; Neuberger and Haberkern, 2014; Di Novi *et al.*, 2015; Lakomý, 2019).

The EU vigorously supports active ageing policies, which have resulted in thousands of events and programmes at all geographical levels of the European continent. The development of the Active Ageing Index (AAI) as a multi-dimensional operationalisation measuring active ageing across countries was amongst the most ambitious and influential projects implementing active ageing (European Commission, 2013; Sidorenko and Zaidi, 2013; Vidovićová, 2018). The values of the AAI for each country and region are published every two years in order to indicate 'the untapped potential of older people for more active participation in

economic and social life' (Zaidi *et al.*, 2018*a*: 3). Importantly, the large-scale AAI project suggests the following two points. Firstly, all targeted activities are intended to spread over time with individuals expected to perform as many roles as possible. Secondly, no cultural, institutional or economic differences within the EU are sufficiently considered by the uniform set of supported activities.

QoL is a key outcome of this study because its improvement in older adults – besides the improvement of health and independence – is the central goal of active ageing, as well as of other approaches focused on the older population (Walker, 2004; Paúl *et al.*, 2012; United Nations, 2013; Marsillas *et al.*, 2017). The concept of QoL is a complex research phenomenon due to its amorphous and multi-dimensional nature, which is reflected differently by several competing paradigms (Walker, 2005). This study uses the CASP scale as the theoretically and empirically grounded measurement of subjective QoL in later life, which is further discussed in the methodological section.

Some proponents of active ageing present empirical evidence on the benefits of roles supported by active ageing to QoL (Reichert and Weidekamp-Maicher, 2004; Walker, 2005; Katz, 2009; Marsillas *et al.*, 2017), but this empirical evidence usually comes from the most prosperous countries and is obtained from cross-sectional data. Moreover, the effect of various roles differs (Siegrist and Wahrendorf, 2009; Potočnik and Sonnentag, 2013), with identical roles having various outcomes across macro-contexts (Adams *et al.*, 2011; Neuberger and Haberkern, 2014; Di Novi *et al.*, 2015), which should also appear in the region-specific models including all important activities.

Theoretical approaches applied to activity outcomes

The proponents of active ageing aim for an increasing prevalence of all activities and expect the effect of activities on QoL to be positive regardless of other factors (Walker, 2009; United Nations Economic Commission for Europe and European Commission, 2015; Zaidi *et al.*, 2017; Varlamova, 2018). However, an increasing amount of empirical findings show that the outcomes of each activity in older ages depend on its content and micro/macro-context (Adams *et al.*, 2011; Di Gessa and Grundy, 2013; Neuberger and Haberkern, 2014; Lakomý, 2019, 2020). The outcomes of activities varying from positive to negative are expected by neither the active ageing approach nor the activity theory. However, more recent adjustments to the active ageing approach and activity theory claim that only personally meaningful and freely chosen activities improve QoL in later life (Musick and Wilson, 2003; Rozanova *et al.*, 2012; Foster and Walker, 2015). This revised version of the whole activity approach makes it possible to expect varying outcomes of activities although many publications, and especially policy tools, do not take this revision into account (Timonen, 2016; Marsillas *et al.*, 2017; Zaidi *et al.*, 2018*b*).

The active ageing approach and activity theory are based on a set of role theories (George, 1993). The theory of role accumulation expecting beneficial outcomes of additional roles (Sieber, 1974), the theory of role strain expecting harmful outcomes (Goode, 1960), the continuity theory (Atchley, 1989), *etc*. These approaches assume that individual identities are developed and maintained through social roles. Based

on this point of departure, the activity theory assumes that older adults need to maximise their activities – especially after the retirement exit – in order to maintain the sense of identity through performance of (meaningful) roles (Havighurst, 1961; Nimrod, 2007). Hence, especially roles in the area of part-time/flexible jobs, care-giving and social participation (such as volunteering) are stressed to bring the potential to enhance identity and improve the QoL, if they are normatively supported (Neuberger and Haberkern, 2014; Di Novi *et al.*, 2015) and individually meaningful (Adams *et al.*, 2011; Rozanova *et al.*, 2012).

In contrast to the role approaches, social identity theory, rather than the importance of relatively stable roles and role expectations for individual identity, stresses the more-flexible group memberships (Tajfel and Turner, 1979; Hornsey, 2008: 210). Categorisation through social participation into groups enables an improvement of self-concept – and ultimately of subjective QoL – through comparison to other groups, such as older people not performing the activity. Moreover, social categorisation into social groups alters the choice of other activities and overall outcomes of any roles, as 'the norms of relevant ingroups are a crucial source of information about appropriate ways to think, feel, and act' (Hornsey, 2008). Nevertheless, the assumption of these mechanisms is an adequate salience of a given group, which may be not fulfilled by occasionally visiting a sports club or third-age university. Generally, the social identity theory would assume that it is particularly activities within positively evaluated social groups that improve the QoL of older adults. Furthermore, this approach can account for the variation of outcomes both within and amongst countries and welfare states due to emphasising the normativity of cognition and behaviour based on group values (Hornsey, 2008; Hogg, 2016).

Empirical evidence on the effects of activities and their interdependencies

The roles in later life are interdependent because both conflicts (Goode, 1960) and complementarities (Sieber, 1974) amongst roles are the usual phenomena. Furthermore, group membership and connected social norms also vary in their salience (Hornsey, 2008; Sets and Burke, 2010). A change in one role can affect the outcome of others; thus, all key roles in later life should be contained in the same model when their impact on QoL is evaluated.

The existing research suffers from several gaps stemming from the issues discussed above. Firstly, many papers have examined the effect of employment/retirement (Latif, 2011; Di Gessa and Grundy, 2013; Horner, 2014), provision of care (Colombo *et al.*, 2011; Broese van Groenou *et al.*, 2013) and activities of social participation (Adams *et al.*, 2011; Cattan *et al.*, 2011) on QoL. This common research design examining the effect of one type of activity ignores their interconnections. Secondly, some research controlled the labour force participation, whilst evaluating the effect of care-giving on QoL (Neuberger and Haberkern, 2014; Di Novi *et al.*, 2015; Lakomý, 2020). Nevertheless, these studies still do not cover many key activities, and use only cross-sectional data. Thirdly, some authors studied the dependencies amongst different activities in older ages, but did not analyse their effect on any outcome (Burr *et al.*, 2005, 2007; Arpino and Bordone, 2017, 2018).

Arpino and Bordone (2017) argue that competition amongst activities should be reflected by active ageing approach. However, only the study of Potočnik and Sonnentag (2013) not following changes over time has included all the main types of activities in later life in one model, which this paper aims to address. Hence, the paper expands the existing body of literature by (a) reflecting various outcomes of activities under different societal settings, (b) controlling for other activities, and (c) utilising the possibilities of the cross-national panel data.

The effects of activities and their variation across social contexts

The role outcomes may depend not only on the characteristics of an individual or on their compatibility with other roles, but also on the context connected to the prevalence, meaning, form and tradition of specific activities (Pines *et al.*, 2011; Rozanova *et al.*, 2012; Timonen, 2016; de São José *et al.*, 2017). The economic, institutional and cultural conditions in a given country shape the outcomes of different activities to various degrees and the next paragraphs aim to identify the essential macro-factors for each type of activity available in the literature.

Labour force participation as a role highly emphasised by active ageing policies (Foster and Walker, 2015; Madero-Cabib and Kaeser, 2016) seems more beneficial in less-wealthy countries as a way to maintain living standards (Borges Neves *et al.*, 2013; Hofäcker, 2015; Lakomý, 2019). The level of labour force participation in later life in a country is shaped by the statutory retirement age, which does not vary much across European countries (Trading Economics, 2017), with this variation being mostly explained by the varying life expectancy (Salomon *et al.*, 2012). This activity has positive effects for older adults according to some studies (Daatland *et al.*, 2010; Di Gessa and Grundy, 2013), whilst other found negative (Latif, 2011; Horner, 2014; Gorry *et al.*, 2015) or context-dependent effects (Borges Neves *et al.*, 2013; Lakomý, 2019) of working longer. Regarding the contextual variation, Borges Neves *et al.* (2013) find that active employment reduces depression of older adults in countries of southern and central Europe as opposed to western and northern Europe. Similarly, Lakomý (2019) indicated the positive effect of labour force participation in southern and post-communist Europe and the negative effect in northern and western Europe, with the pension adequacy as the most suitable explanation of these regional differences.

The previous research has found a rather positive effect of less-intensive (Potočnik and Sonnentag, 2013; Lakomý, 2020) and negative effect of more-intensive and personal care-giving (Colombo *et al.*, 2011; Broese van Groenou *et al.*, 2013; Kaschowitz and Brandt, 2017) and this paper keeps the distinction. The provision of care can be more beneficial in countries with stronger familial norms (Neuberger and Haberkern, 2014; Di Novi *et al.*, 2015). This difference seems attributable to the concept of structured ambivalence. The structured ambivalence, inspired by the concept of sociological ambivalence (Merton, 1976) and coined by Connidis and McMullin (2002*a*, 2002*b*), expects that roles fitting the social norms lead to subjective outcomes better than those of non-fulfilment of normative expectations. Therefore, various types of care-giving are more beneficial in macro-contexts more appreciating the role of the care-giver and punishing its avoidance via stronger familial norms (Neuberger and Haberkern, 2014).

Moreover, care-giving can be more beneficial in countries where formal care is more available, which makes informal care-giving less focused on intensive personal care dictated by circumstances. Formal care seems especially important in splitting the responsibilities for a dependent older relative with family (Daatland and Lowenstein, 2005; Brandt *et al.*, 2009; Lakomý, 2020). The paper by Di Novi *et al.* (2015) is a rare example of a detailed study on the contextual variation of care-giving outcomes, which found a beneficial effect of care provision on subjective QoL in southern Europe (normative appreciation), detrimental effect in continental Europe (lower normative support and lower availability of formal care) and no effect in northern Europe (lower normative support and higher formal care availability).

The effect of social participation is – compared to the ambiguous effect of caregiving and labour force participation – generally positive (Adams *et al.*, 2011; Cattan *et al.*, 2011; Potočnik and Sonnentag, 2013). Social participation is the group encompassing the rest of the activities studied although physical activity or volunteering do not necessarily have the social dimension. The social participation is usually supported by civic norms in society (Curtis *et al.*, 2001; Hank, 2011; Wiertz and Lim, 2019), which stem from the cultural, political and religious tradition of a given society (Hank, 2011), and is higher in more-developed countries and more-stable democratic regimes (Curtis *et al.*, 2001; Hooghe *et al.*, 2016; Nikolova *et al.*, 2017). The concept of structured ambivalence applied to social participation would mean that the activities of social participation have a more-positive effect in more-developed civic societies, in which they are more appreciated.

Hypotheses and their justification

Addressing all the main roles and other characteristics within an individual in panel data, this paper hypothesises:

- Hypothesis 1: The effect of labour force participation on subjective QoL is negligible.
- Hypothesis 2: The effect of care-giving outside the household on subjective QoL is positive.
- Hypothesis 3: The effect of care-giving within the household on subjective QoL is negative.
- Hypothesis 4: The effect of activities usually performed in groups and designated as social participation on subjective QoL is positive.

Most importantly, the variation across contexts is expected for all overall effects:

- Hypothesis 5: The effect of labour force participation on subjective QoL is more positive in less-prosperous regions.
- Hypothesis 6: The effect of care-giving outside the household on subjective QoL is more beneficial in regions with stronger familial norms.
- Hypothesis 7: The effect of care-giving within the household on subjective QoL is more beneficial in regions with higher accessibility of formal care.
- Hypothesis 8: Types of social participation have a more-positive effect on subjective QoL in regions with stronger civic norms.

Hypotheses 1–4 address the overall effects of activities and stem primarily from the cited empirical evidence. The activity theory would assume positive effects of all (at least all meaningful) activities (Havighurst, 1961; Adams *et al.*, 2011), whilst the social identity theory expects beneficial outcomes of activities within positively evaluated social groups (Tajfel and Turner, 1979; Hornsey, 2008), which contains social participation and, to some extent, labour force participation as well. Hypothesis 5 is based on the assumption of more beneficial labour force participation in less-wealthy countries as a way to maintain the living standard in later life (Borges Neves *et al.*, 2013; Hofäcker, 2015; Lakomý, 2019). Hypothesis 6 follows the logic of structured ambivalence (Connidis and McMullin, 2002b; Neuberger and Haberkern, 2014), expecting the care-giving outside the household to be more beneficial in regions with a higher social appreciation of this activity. In contrast, the care-giving within the household is expected to be more beneficial in the conditions of more-accessible formal care (Hypothesis 7), with the responsibilities for a dependent older relative shared by the family (Daatland and Lowenstein, 2005; Brandt *et al.*, 2009; Lakomý, 2020). Finally, Hypothesis 8 also uses the argument of structured ambivalence, but this time for social participation and its higher appreciation in the conditions of stronger civic norms (Curtis *et al.*, 2001; Hank, 2011; Wiertz and Lim, 2019).

Data, methods and variables

Data and sample

This study uses data from the SHARE project, which is a large European project in which respondents from nationally representative samples of the population over 50 years and their spouses are interviewed every two years (Börsch-Supan *et al.*, 2013; Börsch-Supan, 2017). The SHARE data from Waves 4, 5 and 6 provide recent information from three time-points in a medium timespan, which capitalise on the panel dimension of the data and provide enough within-person variation to control for unobserved heterogeneity. Furthermore, more countries participated in these subsequent waves than in the previous ones. The selected analytical approach uses only observations present in all waves of measurement, and thus it would be problematic to use more than three consecutive waves due to a low number of countries and respondents participating continually over a longer time. Finally, each of the waves misses some countries participating in SHARE, which disqualifies these countries for the analysis.

The countries listed in the study are categorised by their welfare regimes as defined by Esping-Andersen (1990) and other scholars developing this typology (Ferrera, 1996; Fenger, 2007; Ebbinghaus, 2012) into four European regions. The welfare regimes typology is often used in social sciences research (Ebbinghaus, 2012; Kammer *et al.*, 2012; Hansen and Slagsvold, 2016; Sirovátka *et al.*, 2019) for reasons similar to this study. The paper finds this typology very useful due to its grouping of countries similar in welfare politics, geographic location, economic, institutional and cultural settings, the prevalence of activities, the average level of QoL and other vital macro-factors (Walker, 2004; Eikemo *et al.*, 2008; Borges Neves *et al.*, 2013; Di Novi *et al.*, 2015; Sirovátka *et al.*, 2019). Hence, the typology is used for identifying groups of countries rather than for examining the effect of

the welfare state as such. The final sample consists of data from 11 EU countries divided in line with the welfare regimes typology (Esping-Andersen, 1990) into social-democratic countries (Denmark and Sweden), conservative countries (Austria, Belgium, France and Germany), Mediterranean countries (Italy and Spain) and post-communist countries (Czech Republic, Estonia and Slovenia) for the more context-specific part of the analysis.

This study covers respondents aged 51–86 in Wave 4 of 2011 (age range 55–90 in Wave 6 of 2015), because active ageing addresses the chronological age as a flexible characteristic and directs its policies at all groups of older adults (Timonen, 2016; de São José *et al.*, 2017; Zaidi and Howse, 2017). The respondents aged 90 + in Wave 6 (about 2%) were dropped in order to prevent any distortion of the results by outliers with different characteristics and living conditions. The panel attrition in the sample was 32.2 per cent between Waves 4 and 5 and 23.8 per cent between Waves 5 and 6. A total of 28,283 respondents met the age definition and participated in all three waves, including 11,191 respondents not asked questions about care-giving in Waves 4 or 5 (being not family respondents) and 3,567 had at least one more missing value. Hence, the final balanced sample consists of 13,525 individuals present in all three waves. Although the drop in the number of respondents who were not family respondents may seem large, this step ensures that people living with a partner are not overrepresented, and only one member of every household is present in the final sample. The sensitivity analyses revealed that changes in the definition of the sample or the way of dealing with the missing values do not substantially alter the findings.

The baseline characteristics of the panel sample are displayed in Table 1. The table contains descriptive statistics of the whole sample, but also of the four European regions separately, as this grouping is used in the analysis. On the whole, some activities are more prevalent amongst older adults – labour force participation, care provided outside households and physical activity – whilst care-giving within the household, educational courses and participation in political organisations are rare. Regarding regional differences, all activities except for care-giving within households are most prevalent in social-democratic countries (levelling conservative countries in volunteering and political participation), whilst the opposite is true for Mediterranean countries. Conservative and post-communist welfare states fall in between, with most of the activities being carried out more often in conservative countries. The regions are similarly ordered in other individual characteristics, with social-democratic countries having higher mean age, higher level of education, QoL, better health and better financial situation. Mediterranean countries and post-communist countries can be found at the opposite end of the spectrum.

Method

The analysis uses panel data from three waves of SHARE with the continuous outcome variable. The methodological approach capitalises on combining the selection into specific activities and the consequences for QoL over time. All models use the enter (not stepwise) method with inserting all variables simultaneously. The data structure has two levels – observations in time nested in the individual – and some parts of the analysis are also sorted by the European region. An alternative

Table 1. Descriptive statistics of the baseline characteristics of 13,525 respondents available for analysis in the Survey of Health, Ageing and Retirement in Europe (SHARE), Waves 4, 5 and 6, sorted by welfare regime

Variable	Categories or range	Total	Social-democratic countries	Conservative countries	Mediterranean countries	Post-communist countries
			Percentages or mean values			
Quality of life: CASP-12 (mean)	13–48	37.3	40.3	38.4	34.9	36.2
Labour force participation	Yes	30.7	41.9	30.3	23.5	30.6
Care-giving outside household	Yes	41.2	48.2	41.7	36.5	40.4
Care-giving within household	Yes	5.8	3.6	5.0	8.8	6.1
Volunteering	Yes	14.2	20.3	21.0	8.8	7.1
Educational course	Yes	7.4	11.1	9.3	3.7	5.5
Sport or social club	Yes	27.1	46.6	31.1	13.3	21.9
Political organisation	Yes	4.4	6.0	6.1	2.0	3.0
Physical activity	Yes	58.3	65.8	58.1	42.2	62.9
Age (mean)	51–86	65.6	65.7	65.2	66.3	65.6
Partner in the household	Yes	55.8	60.9	51.8	66.4	54.0
Able to make ends meet	Great difficulty	10.7	2.4	6.7	16.8	15.3
	Some difficulty	28.5	10.8	21.4	36.7	38.8
	Fairly easily	33.9	29.9	38.5	32.4	30.8
	Easily	27.0	57.0	33.6	14.2	15.1
Subjective health status	Poor	9.3	4.7	6.1	9.6	14.4
	Fair	29.6	17.6	23.8	31.1	39.4
	Good	36.2	25.2	40.9	40.4	32.8
	Very good	17.3	31.5	20.7	14.4	10.0
	Excellent	7.6	21.0	8.6	4.5	3.5

Gender	Male	37.1	43.1	40.5	37.0	31.3
	Female	62.9	56.9	59.5	63.0	68.7
Education level	ISCED 0, 1	19.1	15.4	16.8	52.0	9.1
	ISCED 2–4	56.8	46.0	53.3	39.6	71.4
	ISCED 5, 6	24.1	38.6	29.9	8.4	19.5
Country	Austria	11.7		30.3		
	Belgium	12.6		32.4		
	Czech Republic	11.3				32.2
	Denmark	6.7	58.2			
	Estonia	15.7				45.0
	France	10.9		28.0		
	Germany	3.6		9.3		
	Italy	7.4			50.1	
	Slovenia	7.9				22.8
	Spain	7.4			49.5	
	Sweden	4.8	41.8			
N		13,525	1,561	5,246	1,994	4,724

Notes: The group of social-democratic countries consists of Denmark and Sweden, conservative countries consists of Austria, Belgium, France and Germany, Mediterranean countries consists of Italy and Spain and post-communist countries consists of the Czech Republic, Estonia and Slovenia. ISCED: International Standard Classification of Education.
Source: SHARE, Waves 4, 5 and 6, author's calculations.

approach could be adding a third level of the multilevel data structure in the form of country, but 11 countries do not suffice for this step (Bryan and Jenkins, 2016). The hypothesised effects can be estimated through random- or fixed-effects regression in the two-level data structure, which are the two approaches compared in the analysis. The random-effects regression works on the same principle as the ordinary least squares regression and usually produces very similar results, whilst it is adjusted to the panel data structure and aims to model change over time. This technique uses both between-person and within-person variations, treating unobserved differences as random, which leads to higher efficiency at the expense of higher risk of bias (Allison, 2009).

In contrast, the fixed-effects regression uses only the within-person variation to estimate the coefficients (Allison, 2009). This procedure makes it possible to use every individual as their control, and thus it controls all stable (un)observable macro- and micro-characteristics. This robustness of the method is conditioned by a sufficient variation of predictors and their sufficient exogeneity (Windmeijer, 2000). A difference in coefficients between the random-effects model (REM) and fixed-effects model (FEM) indicates spurious effects in REM, whilst much higher standard errors in FEM result in a low efficiency of FEM estimation (Allison, 2009). The estimation of both models on the whole sample is, therefore, compared using the Hausman test, and the more-appropriate model in terms of efficiency and bias is used for the analysis of sub-groups, which is an approach similar to the one used by Kaschowitz and Brandt (2017) in the study of health effects of informal care-giving for older adults across Europe.

The fixed-effects regression is effective in some threats to causal inference such as selection and endogeneity bias (Allison, 2009; Hanchane and Mostafa, 2012; Brüderl and Ludwig, 2015). Still, it does not solve all aspects of endogeneity, including those related to time-invariant predictors (Cohen *et al.*, 2003; Allison, 2005). Hence, the one time-variant predictor (health) is not included in FEM due to the risk of endogeneity confirmed by the Hausman test of endogeneity, with the all-time invariant predictors being excluded from FEM as well. The problem of endogeneity also relates to the assumption of temporal homogeneity, which can be relaxed if control groups and time dummies are included in the analysis (Brüderl and Ludwig, 2015). Regarding the alternatives, the random-effect-within-between model provides more analytical options at the expense of a higher risk of bias connected to the normality assumption (Bell *et al.*, 2019), but these are not needed in the presented analysis. Therefore, a fixed-effects regression is used by this research as superior for evaluating causal effects in this specific design (Gunasekara *et al.*, 2014; Brüderl and Ludwig, 2015; Bell *et al.*, 2019), whilst the results should be replicated by alternative techniques in future research.

Regarding the data structure, the paper uses balanced data with respondents having fewer than three observations in the time being dropped. Table 2 shows two types of predicted probabilities – the probability to end and probability to start a given activity – with the absolute frequency of these transitions in parentheses. These data illustrate that transition from most of the activities is much more probable than transition into activities, but the frequencies of starting and ending particular activities do not differ substantially (except for labour force participation). Computing two types of transformation for each activity would give a

Table 2. Transition probabilities of activities (and number of changes in parentheses) between two consecutive waves for 27,050 possible changes in time

Activity	Type of transition	Social-democratic countries	Conservative countries	Mediterranean countries	Post-communist countries	Total
Labour force participation	0 → 1	0.015 (28)	0.012 (92)	0.019 (60)	0.023 (158)	0.017 (338)
	1 → 0	0.193 (232)	0.222 (646)	0.216 (189)	0.248 (644)	0.225 (1,708)
Care-giving outside household	0 → 1	0.249 (404)	0.215 (1,301)	0.198 (500)	0.228 (1,255)	0.221 (3,460)
	1 → 0	0.324 (487)	0.333 (1,481)	0.448 (655)	0.377 (1,487)	0.362 (4,110)
Care-giving within household	0 → 1	0.024 (71)	0.036 (356)	0.060 (218)	0.044 (389)	0.041 (1,034)
	1 → 0	0.708 (68)	0.604 (329)	0.638 (231)	0.624 (378)	0.625 (1,006)
Volunteering	0 → 1	0.083 (206)	0.094 (781)	0.042 (153)	0.046 (403)	0.066 (1,543)
	1 → 0	0.335 (212)	0.368 (808)	0.467 (161)	0.636 (411)	0.417 (1,592)
Educational course	0 → 1	0.066 (185)	0.049 (468)	0.020 (75)	0.028 (253)	0.039 (981)
	1 → 0	0.623 (210)	0.573 (525)	0.739 (99)	0.622 (298)	0.606 (1,132)
Sport or social club	0 → 1	0.267 (437)	0.149 (1,077)	0.073 (254)	0.101 (750)	0.127 (2,518)
	1 → 0	0.229 (340)	0.345 (1,127)	0.586 (303)	0.440 (886)	0.364 (2,656)
Political organisation	0 → 1	0.048 (139)	0.037 (363)	0.020 (79)	0.023 (206)	0.031 (787)
	1 → 0	0.630 (131)	0.482 (329)	0.649 (61)	0.652 (187)	0.557 (708)
Physical activity	0 → 1	0.406 (417)	0.293 (1,325)	0.293 (662)	0.348 (1,262)	0.321 (3,666)
	1 → 0	0.188 (393)	0.273 (1,630)	0.366 (632)	0.278 (1,618)	0.273 (4,273)
N of potential changes		3,122	10,492	3,988	9,448	27,050

Note: The group of social-democratic countries consists of Denmark and Sweden, conservative countries consists of Austria, Belgium, France and Germany, Mediterranean countries consists of Italy and Spain and post-communist countries consists of the Czech Republic, Estonia and Slovenia.
Source: Survey of Health, Ageing and Retirement in Europe (SHARE), Waves 4, 5 and 6, author's calculations.

total number of changes important for the feasibility of FEM, which use only within-person variation. This indicator shows enough changes of explanatory variables between two consecutive waves for each European region; the lowest number of changes is for care-giving within the household in social-democratic countries and participation in a political organisation in Mediterranean countries (139 and 140 changes, respectively).

Dependent variable

QoL has been conceptualised and measured in many ways concerning societal, individual or both types of influences. This paper examines the theoretically grounded and empirically tested CASP-12 scale (Higgs *et al.*, 2003; Hyde *et al.*, 2003), which was designed as opposed to the practice of measuring QoL in older ages by health or longevity. CASP is based on four ontologically grounded domains of QoL in older ages based on the pyramid of needs (Maslow, 1943) and aspires to be a scale that provides a comparable score across societal contexts (Higgs *et al.*, 2003; Hyde *et al.*, 2003). Although each of these domains stands by itself, *control* and *autonomy* together reflect the ability to intervene in the environment and be free of excessive external intervention, whilst *self-realisation* and *pleasure* indicate the presence of satisfying and meaningful activities in a person's life (Higgs *et al.*, 2003; Platts *et al.*, 2015).

Although Borrat-Besson *et al.* (2015) raised some concerns on the comparability of CASP-12 across SHARE countries and the consistency of the autonomy domain, the scale is still the most developed indicator of QoL adjusted for the older population. Then, the CASP-12 scale was designed for the measurement of QoL in younger old age (Higgs *et al.*, 2003; Hyde *et al.*, 2003), being also applicable to very old adults (Gjonça *et al.*, 2010; Lakomý and Petrová Kafková, 2017) due to the overlapping life priorities of these two phases (Baltes and Smith, 2003; Krause, 2007). Each of the four domains is measured using three items on a four-point scale. Hence, the CASP-12 scale can take values between 12 and 48 and captures the multi-dimensional nature of the concept. Furthermore, this variable makes it possible to estimate models based on linear regression that predict the values of CASP based on explanatory and control variables using the value changes across the waves.

Main explanatory variables

The present paper examines the effect of roles prescribed by active ageing, using all important activities as explanatory variables. The employed roles belong to various sections of the SHARE dataset with their measurement taking various forms. The aims of variable transformations were (a) to produce a simple binary indicator for each activity with sufficient within-person variation, and (b) to fit the measurement of any particular activity to its conceptualisation within the active ageing approach as well as possible.

The labour force participation was enquired about by the question 'In general, which of the following best describes your current employment situation?', with options listed. This indicator groups respondents into categories of economically

active – employed, self-employed or unemployed – and economically inactive – retired, home-makers, rentiers or permanently disabled (the latter one is the reference category). The category of unemployed is merged with working older adults, as unemployment is more similar to work than retirement in some of its outcomes (Lakomý and Kreidl, 2015) and unemployment is also connected to active ageing, which supports prolonged labour force participation without guaranteeing jobs (Timonen, 2016). Despite these arguments, some older workers may get discouraged by long-term unemployment (Rife and First, 1989; Maestas and Li, 2006; Axelrad *et al.*, 2018) and experience a lower QoL. However, sensitivity analysis of REM and FEM, (a) dropping the unemployed from the models and (b) including unemployed older adults to the group of economically inactive, revealed no substantive differences in the results.

The 'care outside household' variable indicates care or help provided to any recipient monthly or more often, and 'care within household' indicates more intensive and personal care (daily is the only intensity measured by SHARE) for anybody living in the same household; not providing any care or help of monthly frequency is the reference. These two variables were constructed from a set of more-specific questions covering the type, recipient and frequency of each care-giving relationship. The care-giving outside household was asked in the form 'In the last twelve months, have you personally given any kind of help listed on this card to a family member from outside the household, a friend or neighbour?' and many other questions including looking after grandchild(ren). The indicator of care-giving within the household is based on the item 'Is there someone living in this household whom you have helped regularly during the last twelve months with personal care, such as washing, getting out of bed, or dressing?'

The variables for volunteering, educational courses, sports or social club, political organisation and physical activity indicate whether the respondent engages in an activity 'at least monthly' (value 1) or 'less often/not at all' (value 0 as the reference). The exact wording was 'How often do you engage in vigorous physical activity, such as sports, heavy housework, or a job that involves physical labour?' for an indicator of physical activity and 'Which of the activities listed on this card – if any – have you done in the past twelve months?' for all other indicators. The other activities available in all three waves are 'volunteer or charity work', 'educational or training course', 'sport, social, or other kind of club' and 'participation in a political or community-related organisation'. Most of the measured activities take diverse content and meaning – this cannot be reflected by the data available, but the study aims to show the prevailing effect of each type of activity rather than the consequences of specific situations.

Control variables

Gender, education, country and other time-invariant variables are not included in FEM because they are controlled automatically. Thus, the FEM presented contain four time-variant control variables. *Age* is accompanied by *age squared* to identify a potentially non-linear effect – these two variables are centred on their mean to enable the interpretation of the intercept. The *subjective economic situation* is measured by the question 'Would you say that your household is able to make ends

meet…' with the following options: with great difficulty (the reference category), with some difficulty, fairly easily and easily. The REM controls all variables of FEM and additionally gender, health, education and country. *Subjective health status* is also measured directly using the options of poor (reference), fair, good, very good and excellent health. *Gender* has the categories male = 0 (reference) and female = 1, the *level of education*, as measured by the International Standard Classification of Education (ISCED) scale, divides respondents into groups with primary (ISCED 0, 1; reference), secondary (ISCED 2–4) and tertiary education (ISCED 5, 6). Finally, the *country* is included in the REM as a set of binary variables.

Results

Comparison of REM and FEM

Table 3 presents the REM and FEM for the whole sample. REM shows five significantly positive effects (ranging from 0.180 to 0.647) and one negative effect (−1.246) of performed roles on subjective QoL, which means that most of the examined activities increase QoL over time. Specifically, labour force participation, volunteering, physical activity, engagement in a sports club and participation in a political organisation are beneficial for QoL, which supports the assumptions of the active ageing approach. Only care-giving within the household has a negative effect; the coefficients of care provided outside the household and attendance of educational courses are not significant. Men, older adults with a higher level of education and those living with a partner have a higher QoL. Further, age has a non-linear effect, implying the increase of QoL with age followed by a reversed trend at a higher age, whilst the effects of a good financial situation and good health are presumably beneficial. However, FEM has the potential to identify spurious effects of REM connected to potential selection bias in REM.

The magnitude and significance of coefficients in FEM, which also indicate the impact of change over time, is much lower (Table 3). On the one hand, the positive coefficients from 0.280 to 0.347 still suggest that starting volunteering, physical activity or participation in a sports club between waves has a positive effect (and stopping them has a negative effect) on subjective QoL, whilst care-giving within the household decreases QoL. On the other hand, starting with labour force participation and organised political activity do not increase QoL in time, with even the significant coefficients for activities dropping substantially. Apart from a partner in the household, all control variables have significant fixed effects, although decreased in magnitude. The control variables could also be used in interactions with activities. For instance, the effect of activities could vary strongly by gender (Adams *et al.*, 2011; Rozanova *et al.*, 2012). However, the interactions are generally not significant, and the only notable difference based on gender is a slightly more positive effect of physical activities of men. Generally, the standard errors of most coefficients are 0.02–0.08 higher in FEM than in REM, which implies a lower efficiency of FEM. Moreover, the difference between the coefficients of these models signifies that a large part of the random effects can be accounted for by some time-invariant factors controlled only in FEM. The difference between models being confirmed by the Hausman test with <0.0001, FEM provides less-effective estimation, but also less-biased results.

Table 3. Random-effects and fixed-effects regression models predicting subjective quality of life

	Random-effects model		Fixed-effects model	
	Coefficient	SE	Coefficient	SE
Constant	31.317***	0.205	35.145***	0.174
Labour force participation	0.180*	0.082	−0.002	0.139
Care-giving outside household	0.067	0.050	−0.027	0.073
Care-giving within household	−1.264***	0.097	−1.056***	0.152
Volunteering	0.647***	0.073	0.322**	0.103
Educational course	0.034	0.095	−0.002	0.120
Sport or social club	0.507***	0.058	0.228**	0.082
Political organisation	0.246*	0.111	−0.003	0.151
Physical activity	0.564***	0.050	0.347***	0.073
Age	0.612***	0.049	0.941***	0.111
Age squared	−0.005***	0.000	−0.007***	0.001
Partner in the household	0.406***	0.065	0.020	0.199
Able to make ends meet (Ref. With great difficulty):				
With some difficulty	1.619***	0.083	1.182***	0.132
Fairly easily	3.394***	0.088	2.441***	0.147
Easily	4.402***	0.094	2.993***	0.157
Subjective health status (Ref. Poor):				
Fair	2.721***	0.086		
Good	4.641***	0.090		
Very good	5.806***	0.102		
Excellent	6.595***	0.122		
Gender (Ref. Male)	−0.263***	0.070		
Education level (Ref. ISCED 0, 1):				
ISCED 2–4	0.513***	0.096		
ISCED 5, 6	0.659***	0.114		
Country (10 dummy variables)	Not shown			
N	40,575		40,575	

Notes: SE: standard error. Ref.: reference category. ISCED: International Standard Classification of Education.
Source: Survey of Health, Ageing and Retirement in Europe (SHARE), Waves 4, 5 and 6, author's calculations.
Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Variation in FEM by welfare regime

Table 4 shows the results of FEM as a less-biased method for each European region separately. The results show a robust positive effect of financial situation on QoL across regions, whilst the non-linear effect of age is not significant only in

Table 4. Fixed-effects regression models predicting subjective quality of life sorted by European region

	Social-democratic countries		Conservative countries		Mediterranean countries		Post-communist countries	
	Coefficient	SE	Coefficient	SE	Coefficient	SE	Coefficient	SE
Constant	36.578***	0.634	36.220***	0.304	32.190***	0.479	34.253***	0.264
Labour force participation	−0.343	0.276	−0.130	0.210	0.512	0.431	0.075	0.254
Care-giving outside household	−0.068	0.153	−0.059	0.108	0.006	0.221	0.009	0.132
Care-giving within household	−0.160	0.358	−0.868***	0.233	−1.272***	0.360	−1.294***	0.269
Volunteering	0.448*	0.225	0.258	0.143	1.008**	0.378	0.137	0.210
Educational course	−0.110	0.218	−0.065	0.167	0.394	0.561	0.060	0.251
Sport or social club	0.136	0.172	0.075	0.118	1.266***	0.294	0.292	0.158
Political organisation	0.076	0.285	0.103	0.203	−0.104	0.609	−0.113	0.336
Physical activity	0.348*	0.173	0.327**	0.111	0.341	0.205	0.326*	0.131
Age	1.107***	0.239	0.708***	0.166	0.517	0.337	1.323***	0.202
Age squared	−0.008***	0.002	−0.005***	0.001	−0.004	0.002	−0.010***	0.001
Partner in the household	−0.705	0.402	0.062	0.314	0.901	0.576	−0.139	0.346
Able to make ends meet (Ref. With great difficulty):								
With some difficulty	0.832	0.559	1.130***	0.253	1.210***	0.279	1.066***	0.193
Fairly easily	1.637**	0.581	2.466***	0.267	2.345***	0.333	2.364***	0.219
Easily	2.301***	0.580	2.981***	0.279	3.052***	0.385	2.866***	0.247
N	4,683		15,738		5,982		14,172	

Notes: The group of social-democratic countries consists of Denmark and Sweden, conservative countries consists of Austria, Belgium, France and Germany, Mediterranean countries consists of Italy and Spain and post-communist countries consists of the Czech Republic, Estonia and Slovenia. Ref.: reference category.
Source: Survey of Health, Ageing and Retirement in Europe (SHARE), Waves 4, 5 and 6, author's calculations.
Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Mediterranean countries. In contrast, the coefficients for activities vary much more in the European context. Changes in labour force participation affect QoL in the opposite direction in social-democratic and Mediterranean countries, although these substantive effects (−0.343 and 0.512) are not significant ($p = 0.215$ and $p = 0.235$) due to the lower effectiveness of the estimation. Care-giving within the household has a strong negative effect, −1.294 in post-communist countries, −1.272 in Mediterranean countries and −0.868 in conservative countries, but none in social-democratic countries. Starting volunteering between waves increases QoL only in social-democratic and Mediterranean countries, with both statistically and substantively significant coefficients, 0.448 and 1.008. Participation in a sports or social club has a coefficient of 1.266 with $p < 0.001$ in Mediterranean countries, but no effect whatsoever in the other regions. Care-giving outside the household, taking an educational course and participating in a political organisation have neither a substantially nor statistically significant effect under any welfare regime. Finally, physical activity is slightly beneficial on the border of $p = 0.05$ with virtually identical coefficients between 0.326 and 0.348 in all regions. Generally, the impact of roles on QoL differs across Europe, but the overall effects are rather small and almost negligible compared to the effects of age and economic conditions.

Conclusion and discussion

This paper examines the effect of roles supported by an active ageing approach on subjective QoL and the differences between these effects based on differences across European macro-regions that reflect different socio-economic, cultural and institutional contexts. This topic is crucial amidst the extensive support of the tested activities by the active ageing policies due to its proclaimed uniform contribution to the QoL of older adults (Walker, 2009; United Nations Economic Commission for Europe and European Commission, 2015; Zaidi *et al.*, 2017; Varlamova, 2018). The effect of specific activities has been repeatedly studied, but this research extends the current understanding by employing several novelties. These are (a) all concerned activities are included in one estimation to control for each other, (b) a within-person estimator is used to evaluate changes in panel data with control for time-invariant factors, and (c) potential differences in the effect of roles across four European regions are explored. The panel analysis of the SHARE data resulted in several empirical and theoretical contributions – namely only weak or not statistically significant beneficial effects of supported activities – elaborated below.

First, *the effects of activities supported by the active ageing perspective in fixed-effects regression are much weaker or even non-existent* compared to beneficial effects estimated by random-effects regression. This result suggests that the effects of REM (and of many cross-sectional studies) can be explained by some unobserved variables, such as norms of in-groups, individual values, role centrality or role meaningfulness (Hornsey, 2008; Adams *et al.*, 2011). Furthermore, the REM and findings from previous cross-sectional studies may overestimate the association between the examined social activities and QoL. Therefore, the effect of many activities in a panel perspective – care-giving outside the household and participation in the labour force, training and political organisations – is not beneficial and the effect of care-

giving within the household is even strongly negative. The prevailing net effect of starting or ending activity by a specific person is generally less positive than the effect in the previous studies, which usually did not adopt the more-robust methodological approach of the present paper (Walker, 2004; Katz, 2009; Siegrist and Wahrendorf, 2009; Adams *et al.*, 2011; Potočnik and Sonnentag, 2013). The reasons for prevailingly not significant effects of roles can be (a) the use of a less-biased statistical technique based on panel data, (b) control for important activities in later life, and (c) to some extent also the lower efficiency of estimates because of a reduced sample.

Second, participation in *volunteering, sports or social club, and physical activity* is beneficial in FEM for the pooled sample of European countries, but their *effects are not significant in some regions.* The regional differences in the effect of activities suggest their context-specific role in the lives of older adults, which is not reflected by the active ageing paradigm (Timonen, 2016; de São José *et al.*, 2017; Marsillas *et al.*, 2017) and is mostly in line with the expectations based on the concept of structured ambivalence and the social identity theory. The substantially positive effect of labour force participation in less-prosperous regions compared to the negative effect in more-prosperous regions may thus be an outcome of the relative importance of paid work in various economic settings (Borges Neves *et al.*, 2013; Hofäcker, 2015; Lakomý, 2019). Whilst the higher prevalence of care-giving within the household in Mediterranean countries is related to more-frequent co-residence (Jappens and Van Bavel, 2012; Albertini and Kohli, 2013), the not statistically significant negative effect of this activity in social-democratic countries may reflect the higher availability of formal care in that context (Daatland and Lowenstein, 2005; Fokkema *et al.*, 2008; Brandt *et al.*, 2009). The negative association of care-giving within a household with QoL in three European regions may be explained by the location of care and strength of obligations (Lee *et al.*, 2020). Another explanation could be the adverse effect on QoL in measured domains of autonomy and control over life (Di Novi *et al.*, 2015). In contrast to the expected role of availability of formal care, the strength of familial norms does not correlate with the outcomes of care-giving as expected by the concept of structured ambivalence (Connidis and McMullin, 2002*a*, 2002*b*), as the effect of care-giving outside the household is not more positive in the Mediterranean and post-communist countries. Finally, stronger civic norms could account for the positive effect of volunteering in social-democratic countries based on the higher social appreciation of these activities and lower structured ambivalence, if they are performed (Neuberger and Haberkern, 2014).

Third, the weak and unstable outcomes of activities can be contrasted with the effect of age, economic situation, education and health on QoL, which is strong and robust. Hence, *income security and availability of health care form subjective QoL in later life much more than additional roles.* Although health and income may be strengthened by some types of activities (Thomas, 2011; Hofäcker and Naumann, 2015), availability of resources and services seems impossible to replace in the quest for an improvement of QoL (Rozanova *et al.*, 2012; Timonen, 2016).

Fourth, the paper argues *that the active ageing approach is based on normative and empirically dubious assumptions.* The presented findings challenge those of active ageing policy, but also their theoretical underpinnings in the form of the active ageing concept and the activity theory. Especially serious consequences has the active ageing approach as an official social policy approach to the ageing of

the EU, which needs to be revisited according to the findings of (not only) this study. *The process of revising concerns also activity theory*, which needs to accept that only meaningful and freely chosen activities are beneficial (Adams *et al.*, 2011; Rozanova *et al.*, 2012) and this paper illustrates that the overall effect of activities is not substantial. More valid proved to be *the social identity theory, which makes it possible to explain varying outcomes of activities with different meanings –* such as volunteering and participation in social clubs – by social group norms and salience. Finally, *the concept of structured ambivalence* (Connidis and McMullin, 2002*b*) is beneficial *for explaining the contextual variance in activity outcomes* such as the positive effect of volunteering in countries with stronger civic norms. These approaches address much better both the variation of activity outcomes and a call for replacing 'absolute notions' of social gerontology by probabilistic theories (George, 1993; Phillips *et al.*, 2010) and for a probabilistic rather than causal approach regarding later-life concepts, which could end the theory-poor state of this field (Moulaert *et al.*, 2018). In sum, this paper argues that social research and social policies should reflect the varying – and generally weak – effects of activities in later life identified in this study and consider revising its theoretical underpinnings.

Most limitations of this study stem from the nature of the data, originally not collected for the purposes of the study. First, most of the activities were measured by one closed item used as a binary variable in the analysis. As a result, the regression model distinguishes neither the frequency of the activity nor further details on its particular form. Second, a mild within-person variability of some explanatory variables may contribute to some unstable or not significant fixed effects. Third, the poor availability of panel data means that each European region is represented only by two, thre, or four countries. These countries within regions are similar in many respects but still contain hidden variation. Additionally, no country-level indicators in the data decrease the applicability of the structured ambivalence concept. Finally, fixed-effects regression performed on the panel data does not eliminate all sources of possible selection or endogeneity bias. Despite these reflected limitations, the paper presents the results that are important for research on QoL in older ages and for European social policies aiming to increase this QoL. Nevertheless, more research is needed to test and develop the findings of this study in further comparative, longitudinal and multilevel studies.

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