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ORIGINAL RESEARCH

Life Satisfaction and Happiness Among Older Europeans: The Role of Active Ageing

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Abstract
The older population is growing globally, and more so in some European countries. Aimed at enhancing the quality of life of older people, active ageing has been on the policy agenda in Europe since the beginning of the twenty-first century. Using a subsample of the European Quality of Life Survey consisting of individuals aged 65 and over living in 27 European countries we explore the effect of active ageing on subjective quality of life. The central argument of the paper is that active ageing is cumulative, consisting of a mix of various interconnected activities. Hence, when assessing the impact of active ageing on quality of life we include the whole collection of activities in which seniors engage and avoid limiting to a single activity. Latent Class Analysis is employed to find the mix of interconnected activities in which older adults engage. We identify three classes: home keepers (mainly engaging in housekeeping activities), carers (mainly engaged in caring, but also some housekeeping activities) and those engaged outside their homes (engaged primarily in paid or unpaid work). Multilevel regression models test the connection between the different strategies to remain active in later life on life satisfaction and happiness, the cognitive and affective indicators of subjective quality of life. Our results show that remaining active in later life does not always lead to improvements in subjective quality of life and that separate strategies to remain active in later life are at work to maintain life satisfaction and happiness.

Keywords Active ageing · Quality of life · Subjective wellbeing · Life satisfaction · Happiness

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1 Introduction

In 2018, for the first time ever, persons aged 65 years or above outnumbered children under the age of five. By 2050 one in four people living in Europe are likely to be age 65 or over (United Nations 2019). Demographic ageing presents challenges at individual and societal levels, including health and mental health, economic sustainability, and need for care. The leading policy response to demographic ageing in Europe has been "active ageing". The World Health Organisation (WHO) identifies quality of life as the purpose of active ageing, describing active ageing as "the process of optimising opportunities for health, participation and security in order to enhance quality of life as people age" (WHO 2002). While active ageing has been on the policy agenda in Europe over the past 2 decades, the effect of active ageing on quality of life is not fully understood (Foster and Walker 2013). Different effects of active ageing on quality of life are identified across countries and cultures, often due to various approaches to measure active ageing on the one hand and quality of life, especially its subjective component on the other (Foster and Walker 2013).

Active ageing comprises a range of activities such as volunteering, performing house chores, providing care, or engagement in paid work (WHO 2012). Some studies provide support for the "cumulative hypothesis", pointing out that people engaged in one activity are more likely to engage in other activities (Arpino and Bordone 2018; Hank and Stuck 2008; Kohli et al. 2009). This hypothesis is based on the role-extension theory (Choi Namkee et al. 2007) which explains that performing one role gives the opportunity to engage in other activities, people mastering usually a portfolio of interconnected activities. As such, being active in later life is not restricted to performing a single activity but several different activities. Hence, to fully grasp the relationship between active ageing and quality of life the various activities in which older adults engage should be considered. Yet, measurement of active ageing is often restricted to separate activities and some studies that assess the relationship between quality of life and separate activities consider activities as competing rather than connected (e.g. Warr et al. 2004; Jang et al. 2009). Similarly, subjective quality of life, often referred to as subjective wellbeing (SWB) is a complex measure of quality of life (Diener and Suh 1997; Stutzer and Frey 2010). It is most often measured in national and international surveys through happiness and/or satisfaction with life (Diener et al. 1999; Cummins 2000; Headey and Wearing 2010). Despite the clear differentiation between the cognitive (life satisfaction) and affective (happiness) measures (Headey and Wearing 2010), the terms "quality of life", "happiness", "satisfaction" have been used interchangeably, leading to competing conclusions about drivers of SWB (Ramia 2012).

This study contributes to quality of life and active ageing research by investigating how engagement in various types of activities affects two different measures of subjective quality of life: life satisfaction and happiness. We make three significant contributions. First, we adopt a comprehensive definition of active ageing, considering active ageing as a strategy to combine different types of activities (Voicu and Manea 2019). We operationalise this definition and validate the measurement model on older population, aged 65 years or older, interviewed in the European Quality of Life Survey (2016) across 27 European countries. Second, we assess SWB through both cognitive (life satisfaction) and affective (happiness) measures (Headey and Wearing 2010). Finally, using multilevel regression models we test the effect of different strategies to remain active on the two dimensions of SWB. Our results show that remaining active in later life is not always associated with

higher levels of SWB and that different strategies to remain active do not have the same impact on the two subjective quality of life indicators considered as outcome variables.

The remaining of the paper is structured in five sections. After a review of relevant active ageing and quality of life literature Sect. 2 formulates the hypotheses of the study. Section 3 describes the data and methods and Sect. 4 presents the results. Section 5 discusses the findings in the theoretical framework and wider literature and Sect. 6 concludes.

2 Background and Hypotheses

2.1 Subjective Quality of Life or Subjective Wellbeing (SWB)

The term subjective wellbeing (SWB) was coined by Diener (1984). The study of SWB differs across fields. Positive psychology distinguishes between happiness, life satisfaction, positive affect, negative affect, overall affect and quality of life (Steel et al. 2008). Despite ongoing debates about the most accurate measure of SWB (Kahneman and Krueger 2006; Veenhoven 2008), research in the social sciences most frequently measures SWB through happiness and life satisfaction. While some studies discuss the two as conceptually different, others use them interchangeably (Headey and Wearing 2010).

Life satisfaction is the assessment of the overall conditions of existence as derived from a comparison of one's aspiration to one's actual achievement (Cribb 2000) and it can be measured overall, "all things considered", or across various areas of life, such as work, home, health or relationships, life satisfaction being a complex function of satisfaction with various areas of life (Erdogan et al. 2012). Moreover, the extent to which satisfaction with some areas of life contributes to overall life satisfaction changes over the life course and with important life events (Rojas 2006). Some consider that life satisfaction is an aggregate of satisfaction with various areas of life (van Praag et al. 2003; Bradford and Dolan 2010) while others argue that overall life satisfaction leads to high levels of satisfaction across various areas of life (Diener 1984).

Happiness, "the preponderance of positive over negative affect" (Diener 1984, p. 543) is the affective measure of wellbeing. Some "paradoxes" such as the lack of change in happiness despite countries achieving economic growth, or happiness not increasing beyond moderate individual wealth, have ignited the relatively recent interest of economists and policy specialists in measuring happiness (Duncan 2005).

2.2 The Concept of Active Ageing

Alongside active ageing, scholars discuss successful ageing (Venn and Arber 2011), productive ageing (Hank 2011) and healthy ageing (Hung et al. 2010). Other terms in the ageing literature include positive ageing, affluent ageing, robust ageing (Marina and Ionas 2012). In a meta-analysis of studies of active ageing and wellbeing, Betts Adams (2011) identify that the reciprocal effects between social participation and health and wellbeing "cannot be easily untangled, whether the study is longitudinal or cross-sectional" (p. 702). There is evidence of ameliorative effects of activity participation, yet some activities are likely to benefit men more than women and vice versa (Lennartsson and Silverstein 2001; Agahi and Parker 2008). Various types of activities affect wellbeing but "it is social activity

that has the most evidence in support of its association with positive wellbeing" (Betts Adams et al. 2011, p. 705).

The active ageing approach occurred at the intersection between the "productive ageing" perspective and a human rights perspective to ageing. The productive ageing perspective emphasizes the extended participation of older people on the labour market and in other productive activities. It occurred in response to the economic pressure put by the older population on public spending, being promoted by international organization (EU, OECD) and national states. The human rights perspective prioritises the respect for human rights, stressing the importance of quality of life of older people. WHO approaches active ageing from the perspective of human rights, prioritizing healthy ageing, independence, participation and autonomy (Walker and Foster 2013; Kildal and Nilssen 2013). According to WHO, active ageing refers to "continuing participation in social, economic, cultural, spiritual and civic affairs, not just the ability to be physically active or to participate in the labour force" (WHO 2002, p. 12). As such, this definition of active ageing passes the limitations of the productive ageing perspective and lists the life domains in which older adults can engage.

While this definition of active ageing changed the emphasis from productivity to dignity and respect for human rights among older adults, some critique the intercultural variations of activities performed by the older population (Ranzijn 2010) and the social desirability of the gap created by dividing the older adult population in active-worthy and passive-dependent citizens (Boudiny and Mortelmans 2011). Societies provide different opportunities for remaining active in later life, ranging from part-time employment to informal work for religious congregations or simple housework, addressing individual basic needs. Furthermore, individuals engage in activities depending on their own needs and resources. Therefore, considering a single activity (such as work) may lead to ignoring other ways in which older adults remain active. This can lead to significant biases in cross-national comparisons, as countries employ various strategies regarding retirement, unpaid work among older adults or lifelong learning, to name only few activities that can be included in the portfolio of active ageing.

Moreover, older adults perform simultaneously various roles, having different tasks assigned to each and exposing them to engagement in different activities (Kulik 2015). Thus, an older adult can be simultaneously spouse, parent and grandparent, part time employee and volunteer in a local NGO, each role having assigned tasks and activities, such as looking after an ill partner and grandchildren, doing chores, doing paid and unpaid work. Although there is no consensus regarding competition versus cumulation of various activities in later life (Choi Namkee et al. 2007), empirical data point out that older adults combine various activities, which cluster in systematic patterns (Arpino and Bordone 2018). This paper uses the definition proposed by Voicu and Manea (2019) which sees active ageing as a strategy employed by older adults to meet their ends in daily life, by combining various activities and strategic actions, depending on their own capabilities and contextual constrains.

2.3 Active Ageing and Wellbeing

Psychosocial theories of ageing provide a solid background for understanding to what extent remaining active in later life relates to wellbeing, which is one of the core purposes of the active ageing approach. If we focus on the broad distinction between activity and disengagement, some studies point out that remaining active in later life helps to preserve a

higher quality of life, older people being happier when they are actively engaged and they preserve multiple social interactions (Havinghurst 1961). On the other hand, disengagement theory claims that later life is the time for reduced activity, older adults having a better quality of life when they step back from their professional and social obligations because their physical and cognitive capacities diminish with age (Cumming and Henry 1961). Most empirical studies provide support to the first approach, that remaining active in later life helps to preserve wellbeing.

The connection between activity and wellbeing can be allotted to several factors, which explain why and how older adults who are active have a better quality of life. Among them one can mention social roles (Role Theory), the preservation of internal and external structure (Continuity Theory), and psychological needs (Need-based Theories). Role theory frames the relation between activity and quality of life in older adults in terms of role stain versus role enrichment (Goode 1960; Greenhaus and Powell 2006). Role stain theory posits that performing multiple roles may cause stress and lead to the reduction of individual wellbeing (Goode 1960), due to conflicting obligations, time or emotional demands (Kulik 2015). According to role enrichment theory, multiple roles have positive effects on wellbeing due to three psychological mechanisms: cumulation of positive effects of performing several roles, each of them contributing to the increasing of wellbeing; positive outcomes of satisfactory roles buffer the negative feelings caused by unsatisfactory roles; and the spill over effect, satisfaction with one role enhances the experiences with the others (Greenhaus and Powell 2006). In the same stance, Kulik et al. (2015) shows that quality of the roles and not number of roles matters for quality of life.

Continuity Theory builds on the assumption that older adults try to preserve and maintain their internal and external structures by applying familiar strategies in familiar areas (Atchley 1989). Thus, continuity is the main strategy to deal with changes associated with growing old. Older adults will try to maintain the continuity with their self and with their social environment in order to preserve their identity. This is a dynamic process of adaptation, leading to the preservation of self-esteem, which is related to individual wellbeing.

Needs-based theories, rooted in psychology, consider life satisfaction as a function of need satisfaction (Erdogan et al. 2012). Thus, approaches as multiple discrepancy theory (Michalos 1985), Maslow's need hierarchy theory (1970) and self-determination theory (Ryan and Deci 2000) provide also a generous theoretical framework for understanding the mechanisms connecting active engagement in later life and wellbeing. According to self-determination theory there are three basic psychological needs common for all human beings, independent of the cultural context: need for competence, need for autonomy and need for relatedness. Competence refers to the ability to reach personal ends and to feelings of effectiveness and mastery; autonomy deals with the capacity to decide freely regarding own goals and actions; connectedness indicates the feelings of connections with others in daylily life (Deci and Ryan 2008; Ryan and Deci 2000). The satisfaction of these three needs leads to psychological comfort, while thwarting them has the opposite effects conducing to discomfort and ill-being (Deci and Ryan 2008; Ryan and Deci 2000). However, less discussed by the psychological literature, the satisfaction of the three needs may not be the result of a single activity but that of a combination of activities, several actions being necessary to attain wellbeing. For example, housekeeping can satisfy the need for competence and autonomy, but not the need for connectedness, while looking after grandchildren can satisfy the need for competence and connectedness simultaneously.

Social Production Function Theory (Lindenberg 1986) relates the activity in later life with a mechanism of compensation. Steverink et al. (1998) explains that individuals

compensate losses (reduced physical capacities, lost status due to retirement, or diminished resources) by engaging in alternative activities which can provide them with the satisfaction of psychological needs and can help them preserve their wellbeing. Kim and Feldman (2000) also find that bridge employment and volunteering combine and compensate the effect of retirement on wellbeing.

2.4 Hypotheses

Starting from theories of ageing, we hypothesise the relation between active ageing and SWB. Aging makes people adapt to new circumstances and several circumstances occurring in later life. Retirement, widowhood, the empty nest, or the decline of physical capacities require particular efforts to preserve the individual wellbeing. As Continuity Theory posits, individuals try to adapt to the new circumstances by preserving their internal and external structure and by making adjustments meant to preserve their identity and the continuity of their individual self. When losing one role, older adults substitute it with another or several other roles. By doing this, they maintain their inner coherence and self-esteem. Retirement leads to the withdrawal from the professional role, but it can be replaced by increasing the involvement in volunteering and grandparenting. As some roles are replaced by others, the portfolio of activities changes in later life, the new roles assumed fulfilling the psychological needs for competence, autonomy and connectedness.

The Role Theory, the Need-based Theory and the Social Production Function Theory provide strong reasons why considering a broad portfolio of activities is particularly relevant for the preservation of the SWB in later life. As individuals preform several different roles, we should take into account their combination when studying the connection between activity and wellbeing, because the impact of performing several roles on wellbeing cannot be allotted to each role separately. From a psychological perspective, some roles have positive psychological outcomes and their impact on wellbeing buffers or spills over the effect of the unpleasant activities performed as part of other roles (Greenhaus and Powell 2006). As such, rather than isolating activities, the effect of combinations of activities on wellbeing should be tested. Based on these theoretical considerations we hypothesise that:

H1 The composite measures of active ageing are better predictors of subjective wellbeing than the separate measures of activities.

There is little consent on the effect of ageing on SWB. Some studies identify a U-shaped trajectory of happiness or life satisfaction over the life course (Blanchflower and Oswald 2004; Headey and Warren 2008), while others find life satisfaction to decrease later in life and be U-shaped only in rich countries (Steptoe et al. 2015). The effect of active ageing on SWB is also not fully understood (Foster and Walker 2013). As life satisfaction and happiness relay on different psychological mechanisms, we expect each occurs as the outcome of engagement in different activities or in different combinations of activities. For example, because life satisfaction is a function of satisfaction with various areas of life (Bradford and Dolan 2010), we hypothesise that a range of activities (as opposed to single activity) are necessary to achieve overall life satisfaction. These activities are likely to be highly engaging and rewarding and have a positive effect on life satisfaction. We also hypothesise that, as proposed by ageing

theories, a lasting engagement in such activities would facilitate feelings of fulfilment, leading to higher levels of happiness. Hence, our second hypothesis is:

H2 Individuals engaging in "productive" outside-home activities such as employment or volunteering have higher levels of life satisfaction and higher levels of happiness than counterparts who engage in other types of activities.

On the other hand, growing old is associated with a decline of physical strength and loss of social roles and expectations (Lazarus and Folkman 1984). This leads to the adaptation and re-organization of activities and priorities (Diener 1984), individuals not being able to retrieve pleasure from professional life or many other activities carried out outside home. According to the contraction-convergence model (Fortuijn et al. 2006), disengagement occurs gradually and activities which are demanding in terms of physical and mental abilities are the first ones to be discarded. In later stages of life, home-based activities are predominant (Fortuijn et al. 2006), and older people seek comfort and affection from their family and closer social contacts, as substitution mechanisms (Steverink et al. 1998). Hence, we can expect that older people who are engaging closer with others, in our model through caring activities, will have higher levels of SWB than those engaging primarily in homebased activities. Indeed, caring for grown-ups would have different effects from caring for children. Life satisfaction is likely to be higher among older people with than those without grandchildren (Powdthavee 2011). Caring for grown-ups is also associated with a higher sense of achievement, fulfilment and personal growth (Greenwood et al. 2019) which may add to life satisfaction. On the other hand, some negative feelings, such as worrying for own health, not being able to enjoy experiences outside the home and loss of social networks (Greenwood et al. 2019) may relate to lower happiness. However, previous research also finds care-like activities closely related to needs for autonomy and competence (Deci and Ryan 2008; Ryan and Deci 2000), which may lead to also higher levels of happiness for those caring for other people. We hypothesise that:

H3 Caring activities are more likely to be associated with life satisfaction and happiness in later life.

3 Data and Methodology

Due to cultural variation (Nestor 2017; Kulik 2015), cross-country differences are assumed to exist with respect to the relationship between SWB and active ageing. As such, we employ a Multilevel Regression Model, individuals being nested within countries, which allows to account for cross-country variation of the outcome variables (life satisfaction and happiness). We use a sub-sample of the European Quality of Life Survey (EQLS) 2016, including only adult respondents 65 years or older across 27 European societies. The list of countries included in the analysis is provided in Table 1, together with the sample size by country. EQLS provides relevant information allowing to capture the connection between the two indicators taping quality of life and various strategies employed by older adults to remain active in later life, as well as to control for the relevant independent variables. Control variables for level 2 (country) are retrieved from EUROSTAT and Special Eurobarometer (EB393/20102). These are further discussed towards the end of this section.

Table 1 Sample size and average values of dependent variables by country

	N	Life satisfaction	Happiness
Austria	349	9.1	9.1
Belgium	443	7.3	7.3
Bulgaria	506	3.3	4.7
Cyprus	505	5.3	5.7
Czech Republic	437	6.1	6.6
Germany	686	6.2	6.7
Denmark	483	8.6	8.0
Estonia	547	7.0	7.0
Greece	486	6.2	7.0
Spain	392	6.1	8.5
Finland	644	8.1	8.1
France	464	7.0	8.3
Hungary	534	6.1	6.0
Ireland	432	6.3	7.1
Italy	869	5.8	6.2
Lithuania	517	6.3	6.4
Luxembourg	357	8.5	8.5
Latvia	559	5.9	6.8
Malta	521	5.7	5.7
Netherlands	478	7.4	7.4
Poland	477	5.7	6.3
Portugal	523	6.4	7.0
Romania	493	6.2	6.2
Sweden	601	8.8	8.7
Slovenia	472	6.6	5.8
Slovakia	543	4.0	4.2
United Kingdom	569	7.5	6.6

Table 2 Latent class marginal probabilities and marginal means

	Class 1 Home keeper	Class 2 Care provider	Class 3 Engaged
Pr(class)	0.651	0.186	0.163
Probability of			
Employment	0.034	0.001	0.104
Volunteering	0.032	0.161	0.312
Housework	0.503	0.913	0.570
Caring for children and grandchildren	0.214	0.422	0.441
Caring for long-term ill and disabled	0.000	0.245	0.297

We ran three multilevel regression models for each dependent variable (Table 2). The first model is the empty model, without independent variables, which shows the amount of variance that exist between countries, for of each dependent variable. The second model includes the composite measures of active ageing, the individual (level 1) and country (level 2) relevant control variables. The third model comprises the separate independent variables tapping active ageing plus the control variables. The models were ran using *mixed* command in STATA 16. The list-wise deletion of missing values was employed in all models.

4 Dependent Variables

The study uses two dependent variables: life satisfaction and happiness, the cognitive and affective measures of SWB. EQLS respondents ranked their life satisfaction and happiness on a scale from 1 to 10, with 1 being least satisfied/very unhappy and 10 being completely satisfied/very happy. The two questions were: "All things considered, how satisfied would you say you are with your life these days?" and "Taking all things together on a scale of 1 to 10, how happy would you say you are?".

4.1 Independent Variables: Individual Level

We had two approaches to measuring active ageing: as composite indicators of activities and using separate variables for each activity. We then compared the results. Following the definition of WHO (2012) we considered as indictors for active ageing the engagement in the following activities: paid employment, volunteering (monthly), doing housework (daily), looking after grandchildren or children (weekly), looking after sick or disabled relatives (weekly). Each variable was recoded as dummy variable and used as predictor in the multilevel regression models. The choice of indicators was driven by the data available in the dataset, which do not cover the full range of activities that can be employed by an older adult, leading to a limitation of our results.

We used Latent Class Analysis (LCA) to identify the patterns of activities in which the older adults engage and to build the composite indicators of active ageing starting from the activities listed above. LCA captures the interdependency of various activities, enabling us to find the way various activities cluster together without imposing any apriori classification, as in the case of k-mean cluster analysis (Arpino and Bordone 2018). LCA is often referred to "as the categorical data analogue of factor analysis" (McCutcheon 2002, p. 56), providing information regarding the latent structure of the data, when the latent variable is not a continuous variable, but a discrete one. In LCA each case has assigned a predicted probability to belong to a certain class, the model aiming at maximising the homogeneity within the classes and to maximize the heterogeneity among the classes (Porcu and Giambona 2017). According to Hagenaars and McCutcheon (2002), the LCA classification is a measurement technique, as it assigns to each and every case "one and only one set of mutually exclusively and exhaustive nominal categories" (p. xiv). Thus, we use LCA as a measurement model of the latent predisposition of older adults to get involved in a specific collection of activities. The method allows to tap accurately the way of combining various activities, as it provides the opportunity to capture the probability to perform each activity for each respondent, depending on its class membership. Thus,

different of the classical approach, which considers distinctive activities, giving them the same weight for each respondent, LCA allots different predicted probabilities for each activity to every individual, providing a more accurate image of the real life of older adults.

The analysis was computed using *gsem* module in STATA 16. The results of LCA are shown in Table 2. The model with three classes proved to have the best fit, based on the BIC (Bayesian information criterion) as criteria of selection. Our results support findings by Arpino and Bordone (2018), who employed a similar approach on a different data set.

According to the results of the LCA, the older population in EQLS clusters in three different groups depending on their portfolio of activities. We called the first group the **home keeper**, because their members engaged only in housework and to a smaller extent in caring for children and grandchildren. The second group is the **care provider**, including older adults who have a very high likelihood of doing housework and also a high likelihood of caring for grandchildren and children and for sick and disabled relatives. In addition, they may engage in volunteering, but the likelihood is smaller, as compared to the other activities. The third group is the **engaged.** This group is involved in all activities considered for LCA, and the only group that participates in paid employment. When running the multilevel regression models, we considered the first category (home keeper) as the reference category.

Based on the SWB literature, we controlled for several variables. Education was measured on an eight-point scale, according to the International Standard Classification of Education codification. Most research finds high school graduates are happiest or most satisfied with life (Headey and Wooden 2004; Hickson and Dockery 2008) but some studies find a positive relationship between tertiary educational achievements and SWB, especially in the older population (von dem Knesebeck et al. 2007). We captured material deprivation by a variable which indicates whether the respondent reported a delay in making at least one of several types of payment in the past 12 months (rent or mortgage, utility bills, consumer loans, informal loans from friends or relatives). Widely debated in the literature (e.g. Easterlin's paradox, Easterlin 1974), money does 'buy a better life' but only in a limited fashion, with diminishing returns of income to SWB once basic needs are satisfied or a certain level of economic wellbeing is reached (Clark et al. 2005). Gender and marital status were tapped by two dummy variables, indicating whether the respondent is a woman, single or living as a couple (married or de-facto). Traditionally, women report higher levels of SWB than men (Diener et al. 1995) but this relationship has started to shift, with women reporting declining levels of SWB (Stevenson and Wolfers 2008). Inglehart et al. (2002) also finds that the SWB of women declines throughout the life span while that of men remains relatively constant. Individuals who are married or in a de-facto relationship usually report higher levels of life satisfaction or happiness than single, divorced, or widowed counterparts (Headey et al. 2011). Unmarried men are less happy than unmarried women (Lee et al. 1991; Diener et al. 1999). A dummy variable indicates whether the respondent suffers of a chronical health problem. To be noted, the relationship between self-rated health and SWB is often inflated by emotional adjustment (Diener et al. 1999). For example, although health declines with age, older people report higher levels of well-being (Oswald and Powdthavee 2007). Nonetheless, Muffels and Headey (2009) found a positive relationship between physical and mental health and life satisfaction. We also included age, measured by six dummy variables pointing the belonging to a 5-year age group, as a control variable in our models. The reference category is the first age group, 65 to 69 years old. Some studies find a U-shaped relationship between age and SWB, with the youngest and oldest being happiest, or most satisfied with their lives (Heady and Waren

2008), while others find life satisfaction to decrease later in life and be U-shaped only in rich countries (Steptoe et al. 2015).

4.2 Independent Variables: Country Level

We employed two control variables at country level. The first one deals with ageism and it was retrieved from EuroBarometer (EB393/20102). The variable indicates the percentage of the public living in a European country who declared that discrimination based on being over 55 years old is very widespread in their country. Ageism, the widespread stereotyping and discrimination based on age, has negative consequences for the wellbeing of older adults exposed to discriminatory behaviour (Forman and Davis 2005; Sabik 2013), leading to reduced psychological wellbeing and illness (Ober Allen 2016).

The second control variable measures the level of economic development. Inglehart et al. (2008) show that SWB is associated with economic growth, human development and modernization, and the relationship is not linear but logarithmic, economic growth leading to the rise of SWB up to the point of the fulfilment of the basic human needs. After this point the authors report a ceiling effect of economic development on SWB. Therefore, we used as control variable the natural logarithm of the Gross Domestic Product by country, for 2016.

Descriptive statistics for dependent and independent variables are provided in Table 3.

Table 3 Descriptive statistics for dependent and independent variables

Variable	Mean	SD	Min	Max
Individual level				
Life satisfaction	6.52	2.3	1	10
Happiness	6.81	2.1	1	10
Employed	0.04		0	1
Volunteer	0.19		0	1
Housework	0.63		0	1
Care children/grandchildren	0.28		0	1
Care sick/disabled	0.18		0	1
Education	2.79	1.7	0	8
Material deprivation	0.05		0	1
Sex	0.62		0	1
Single	0.43		0	1
Chronic health problems	0.52		0	1
Age				
65–69 (reference)	0.34		0	1
70–74	0.28		0	1
75–79	0.24		0	1
80–84	0.08		0	1
85–89	0.05		0	1
90+	0.01		0	1
Country level				
lngdp	10.02	0.6	9	11
Ageism	47.38	12.3	19	75

5 Results

Data in Table 1 show that there is great variability across countries with respect to both life satisfaction and happiness. Older adults from Scandinavia (Sweden, Finland and Denmark) and Austria have the highest levels of SWB among adults aged 65 and over in Europe, while those living in Bulgaria and Slovakia have the lowest average on both indicators. In some countries such as Bulgaria, Spain, France, and Latvia, the average level of happiness is much higher than the average level of life satisfaction, the gap exceeding one-point on the 1–10 scale. This result points out that, although the two indicators measure the same SWB construct, cross-national differences should be considered when analysing the two indicators of SWB. Furthermore, the results of the multilevel regression models suggest that the mechanisms that explain happiness and life satisfaction in older adults differ across countries. The Interclass Correlation Coefficient (ICC) of the empty model is 0.33 in case of life satisfaction and 0.28 for happiness, pointing out that 33 per cent of the variation in life satisfaction and 28 per cent of the variation in happiness is between countries, which makes meaningful the use of the multilevel modelling. The results of One-way ANOVA show that there is also significant within group variance for both dependent variables (F Test = 240,31, $p > 0.000$ for Life Satisfaction; F Test = 204,26, $p > 0.000$ for Happiness).

Moreover, Table 4 indicates that SWB varies not only across countries, but also across individuals depending on their repertoire of activities. Life satisfaction and happiness are the highest among those belonging to Care provider group and the lowest in case of those belonging to the Home keeper group. However, it is to be noted that in spite of the substantive difference in terms of active engagement with life between the Home keeper and the Engaged, they do not differ much in terms of Life Satisfaction or Happiness, both groups having lower SWB as compared to the Care provider. These results support the findings reported by the literature that domestic work is associated with poor health and low SWB (Wen et al. 2013), while activities involving social relations have a positive impact on it (Litwin and Shiovitz-Ezra 2006).

The results of the multilevel regression models are shown in Table 5. For each dependent variable we computed two models, one using as independent variables the latent classes produced by the LCA and the second replacing these variables with the separate variables used to estimate the latent classes. We tested the first hypothesis by comparing the two sets of models. We compared the model fit, the variance explained, the standard errors and the distribution of the standardized residuals. Assessing the model fit in multilevel regression differs from the procedure employed in OLS (Ordinary Least Squared) regression, because the two measures, R_1^2 and R_2^2, cannot be considered as separate measures. The model has different explanatory power at each level (Gelman and Pardoe 2004). Adding a variable at one level can lead to an increasing in variance explained at that level and to the decreasing of variance explained at the other level. Consequently, we compared the models against the values of ICC and R_1^2 and R_2^2 taken together.

Table 4 Dependent variables by latent classes (average)

	Class 1 Home keeper	Class 2 Care provider	Class 3 Engaged
Life satisfaction	6.326	7.119	6.420
Happiness	6.647	7.166	6.911

Table 5 Multilevel regression models: unstandardized coefficients and standard errors

Variables	Life satisfaction						Happiness					
	Model 1			Model 2			Model 1			Model 2		
	Coef.		SE	Coef.		SE	Coef.		SE	Coef.		SE
Individual level												
Employed				0.625	***	0.10				0.567	***	0.10
Volunteer				0.543	***	0.06				0.278	***	0.06
Housework				0.242	***	0.05				0.171	**	0.05
Care child/grandchild				0.385	***	0.05				0.205	***	0.05
Care sick/disabled				−0.120	*	0.06				−0.275	***	0.06
Engaged	0.201	***	0.04				−0.078		0.05			
Care provider	0.173	**	0.05				0.221	***	0.05			
Education	0.256	***	0.01	0.245	***	0.01	0.206	***	0.01	0.184	***	0.01
Deprivation	−0.891	***	0.07	−0.875	***	0.09	−1.078	***	0.07	−1.140	***	0.09
Migrant	0.367	***	0.07	0.433	***	0.08	0.447	***	0.07	0.362	***	0.08
Female	0.171	***	0.04	0.250	***	0.05	−0.124	***	0.04	0.074		0.05
Single	−0.195	***	0.04	−0.212	***	0.05	−0.399	***	0.04	−0.535	***	0.05
Health problems	−0.423	***	0.03	−0.346	***	0.04			0.04	−0.285	***	0.04
Age												
70–74	−0.130	***	0.05	−0.218	***	0.06	−0.099		0.05	−0.280	***	0.06
75–79	0.155	***	0.05	0.089		0.06	0.000		0.05	−0.043		0.06
80–84	0.465	***	0.07	0.439	***	0.08	0.098		0.07	−0.188	*	0.08
85–89	0.348	***	0.08	0.503	***	0.10	0.089		0.08	−0.003		0.10
90+	0.520	***	0.16	0.498	**	0.20	0.245		0.16	0.084		0.20
Country level												
Ln_gdp	1.514	***	0.31	1.654	***	0.35	1.354	***	0.35	1.470	***	0.39
Ageism	−0.011		0.01	−0.003		0.02	0.008		0.02	0.006		0.02
Constant	−8.691	**	3.63	−10.741	**	4.09	−6.898		4.12	−8.241		4.52

Table 5 (continued)

Variables	Life satisfaction				Happiness			
	Model 1		Model 2		Model 1		Model 2	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
σ^2	2.977		2.741		3.085		2.803	
R_1^2	0.313		0.342		0.184		0.218	
R_2^2	0.708		0.633		0.519		0.424	
ICC	0.14		0.19		0.17		0.22	

***$p < .001$; **$p < .01$; *$p < .05$

The models using the composite measures (latent classes, Model 1) explain better than the models that use separate activities (Model 2) the between-countries variance for both target variables. Thus, in case of life satisfaction, ICC increases from 14 per cent of unexplained variance across countries for Model 1 to 19 per cent unexplained variance for Model 2, while for happiness, ICC increases from 16 per cent for Model 1 to 21 per cent for the model with separate variables. When looking at R_1^2 and R_2^2, indeed, Model 1 has different explanatory power at level 1 and level 2 as compared with Model 2 and this is true for both indicators of SWB. For both target variables, Model 2 (with separate activities) has a higher R_1^2 and a lower R_2^2, as shown in Table 5. However, the growth of R_2^2 for Model 1 is higher than the increasing in the explained variance on level 1 brought by the separate variables. On the other hand, σ^2, which stands for the variance within the groups, is lower for the Models 2 and 4, pointing in the same direction as R_1^2. Taking into considerations these findings we can conclude that using the cumulative measures (Model 1) reduces the heterogeneity within countries with respect to SWB, but the results are to some extent mixed.

The second hypothesis of this paper posed a closer relationship between engagement outside home and SWB. The second model in Table 5 reveals that employment and volunteering have significant positive associations with life satisfaction and happiness. These results support the findings reported by Agahi and Parker (2008) who show that remaining active later in life improves quality of life. However, the multilevel regression models using the composite measure of active ageing predict that engagement outside home is positively associated with life satisfaction, but not with happiness. Thus, those who remain active on the labour market or in civic organization in later life, do not differ significantly from those who are home keepers in terms of happiness. Yet their life satisfaction is significantly higher, providing only partial support to the second hypothesis. Hence, we can conclude that using the composite measure of active ageing sheds light on a different aspect of being active and when taking together all activities in which one engages, the outcome is different than when the effect of each activity is separately assessed. Moreover, some further questions regarding the affinities of the relationship between active ageing and wellbeing arise from this finding, flagged in the Discussion section of this paper.

The third hypothesis assumes a stronger association between SWB and engagement in activities involving personal relations, such as caring for children, grandchildren and sick and disabled relatives. The data in Table 5 find support for this hypothesis and shows that belonging to the care providing group is positively associated with both life satisfaction and happiness, and the effect on happiness is greater. On the other hand, when considering the separate activities, the results are somehow different, only caring for children being positively connected with both measures of SWB and the effect on life satisfaction is almost double that of the effect on happiness. Caring for sick and disabled relatives is negatively associated with both indicators of SWB and the association is stronger for happiness, the more one does this type of care work the lees happy he or she is. The difference occurs most likely due to the spill over of the positive effect of caring for grandchildren which counterbalances the negative impact of caring for sick and disabled adults.

The results of the multilevel regressions show that the control variables associate in the expected way with the target variables. When looking at the individual level, all control variables have significant effects on both life satisfaction and happiness. Thus, both indicators of SWB are positively related to education and gender, as predicted by the literature. At the same time, material deprivation, being single and having poor health have negative connections with SWB. The relationship between age and the two target variables

is not a linear one. In all models SWB decreases in the early seventies, being significantly lower as compared to the age group 65–69, which is the reference group. After the age of 75, life satisfaction increases again, while happiness decreases according to Model 4, but the relationship is very weak and significant only for the age group 80 to 85. However, this result should be considered with caution, as the number of cases is quite small for the age-group 90 + (N = 144 cases).

At country level the results confirm our expectations with respect to the relationship between SWB and the level of economic development. The logarithmic transformation of the GDP, which stands for the level of economic development, is positively associated with the two dependent variables and the association is significant in all four models. As for ageism, the results displayed by the final models, reported in Table 4, indicate a non-significant effect on SWB. However, this result is due to the multi-collinearity between economic development and ageism reported in literature (Levy and Macdonalds 2016). Therefore, when controlling simultaneously for economic development and ageism, the fist variable has stronger contribution to the variance of the target variable and the effect of ageism becomes non-significant. When the control for economic development is not included in the model the effect of ageism becomes significant (results available upon request).

6 Discussion

The purpose of this paper has been to investigate the effect of active ageing on subjective quality of life in Europe. Active ageing was defined as comprising a range of activities (WHO 2012) and life satisfaction and happiness were the two indicators used to measure subjective quality of life. Multiple models tested the three hypotheses of the study.

Active ageing research often focuses on analyses of separate activities (Warr et al. 2004; Jang et al. 2009). Supported by theories of ageing (the Role Theory, the Need-based Theory, the Social Production Function Theory), we separated the population through LCA into home keepers, carers and those engaged outside their homes, and found that the composite measures of active ageing are better predictors of both life satisfaction and happiness (H1). This is the first contribution of our paper to active ageing and wellbeing research. The need for competence, need for autonomy and need for relatedness (Deci and Ryan 2008; Ryan and Deci 2000) explain and measure active ageing and its effect on quality of life in later life. However, only few other studies have attempted similar analyses (Arpino and Bordone 2018; Fortuijn et al. 2006).

The second contribution of this study is that it is essential to distinguish between different indicators of SWB. We found that happiness and life satisfaction in older age differ greatly across and within countries in Europe, indicating that the two measures capture different concepts. Unlike studies that use life satisfaction and happiness interchangeably (Hickson and Dockery 2008) or claim that happiness is the result of satisfaction across areas of life (Cummins 2000), we conclude that it is essential to distinguish between the different approaches to measure SWB and acknowledge them as different indicators of SWB. Furthermore, researchers disagree about the effects of active ageing on quality of life, and this is often the result of discrepancies in how active ageing and quality of life are measured (Foster and Walker 2013). For example, we found that engaging in activities outside home increases life satisfaction but not happiness, while caring for grandchildren increase both life satisfaction and happiness.

The third contribution of this study arises from the finding that the two measures of wellbeing are affected differently by the types of activities in which older people engage (H2 and H3). People who engage outside home are significantly more satisfied with life than the home keepers but not happier. This finding is rather surprising, H2 was only partially confirmed. We attribute this to the cognitive-affective differentiation between life satisfaction and happiness (Vanjoutte and Nazroo 2014). Satisfaction with life is a cognitive measure of wellbeing and work outside home fuels the need for competence (Ryan and Deci 2000), which explains the higher levels for this group. Being engaged outside home would assume more social contact (Betts Adams et al. 2011) and it would be expected that individuals create further networks which fuel their need to connect, hence increase their levels of happiness (Maslow 1970). However, this is not the case, indicating that those who engage in activities outside home might not be engaging in entirely pleasant activities. They might derive satisfaction in various areas of life such as job satisfaction or pay satisfaction (Ramia 2012), but not happiness.

On the other hand, we found that being a carer has a positive effect on both happiness and life satisfaction (H3). Furthermore, the effect on happiness is almost double than that on life satisfaction. This, however, is a less surprising finding. Theory (Maslow 1970; Michalos 1985) and previous research describe care-like activities as closely related to needs for relatedness and autonomy but also competence (Deci and Ryan 2008; Ryan and Deci 2000), leading us to expect rather high levels of happiness for those caring for other people. Having tested the two models revealed that caring for a sick or disabled person can restrict one's freedoms and ability to lead their own life: we found a negative effect on both life satisfaction and happiness of caring for a sick or disabled person (Table 4). Our findings augment research such as Erdogan et al. (2012). This finding further supports the claims of the role theory (Goode 1960; Greenhaus and Powell 2006) which assumes a spill over and buffering effect of activities with positive outcomes on SWB which compensate the negative outcomes of less pleasant activities. The data point out that although some caring activities do not go hand in hand with SWB, the combination of several caring activities has positive effects.

7 Conclusions

his paper focused on the relationship between active ageing and subjective wellbeing, central to research and policy in Europe and beyond. Active ageing and wellbeing research provides mixed results with respect to the relationship between the two. The mixed findings are often the result of using different measures of wellbeing on the one hand and assessing the effect of only separate activities in later life on the other.

We built our theoretical framework on the central argument that active ageing consists of a mix of various interconnected activities. Using LCA we assessed the effects of the collection of activities in which older adults engage and avoided limiting to a single activity or domain. We used the latent classes as predictors of the two indicators of SWB in multilevel regression models. We compared these results against the results from models where individual activities were used to predict SWB. We provided a more accurate measure of active ageing, opposed to the traditional approach that uses separate variable to assess the connection between activity and quality of life in old adults. Our results are, however, limited by the survey data we used, limited to only five activities. Further research should collect a wider range of data and consider a broader range of activities

available to old adults in the cultural context analysed and to study their latent connections, as well as their impact on SWB.

We identify potential areas to be further explored. Firstly, we acknowledge that the mix of activities that promote wellbeing in older adults might change as the person advances through the third and fourth age, hence the impact of combinations of activities on SWB might also change with age (e.g. as the person turns 70, 75, or 80). Both quantitative and qualitative methods are needed to answer these questions and have a significant impact on public policies aimed to improve the wellbeing of older adults. Secondly, further research should investigate how individual motivation interacts with being active and SWB in later life. Some may choose, while others might be forced in maintaining certain levels and types of activities, which will impact their wellbeing. In addition, future research should investigate to what extent this "motivation–activity–wellbeing" relationship in later stages of life varies across countries and culture and if so, what are the country specific factors explaining this variation.

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