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Are physical activity and everyday mobility independently associated with quality of life at older age?

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ABSTRACT

Background: Physical activity and everyday mobility are concepts that overlap but tend to be located in different disciplinary fields. We used the English Longitudinal Study of Ageing (ELSA) to: identify whether physical activity and everyday mobility are separate constructs at younger (60–69) and/or older (>=70) age bands, and for men and women; derive measures of the two constructs from variables in the ELSA; and assess whether they are independently associated with quality of life (QoL).

Methods: We derived composite measures for physical activity and everyday mobility from ELSA variables. 'Physical Activity' combined items recording directly-measured activity for movement (walk-speed) and self-report measures of physical mobility difficulties and amount of vigorous, moderate and mild physical activity undertaken. 'Everyday Mobility' combined self-report responses about activities likely to involve leaving the house. QoL was measured using the 'CASP-19′ scale. Using Wave 9 of ELSA (data collection in 2018–2020), we used a factor analysis to explore the constructs, and a regression analysis to examine associations with QoL.

Results: The factor analysis confirmed that these were discrete constructs, which explained between them 36% of the variance. This was robust across age bands, and in factor analyses for men and women separately. The regression analysis identified that lower physical activity and everyday mobility are independently associated with lower QoL, when controlling for a range of contextual variables including age.

Conclusions: Findings suggest that a social model of QoL at older age should focus on the broader mobility determinants of QoL as well as individual levels of physical activity.

1. Introduction

There is a substantial research literature on the importance of both physical activity and everyday mobility for quality of life at older age [1–5]. Physical activity can be defined as "bodily movement produced by skeletal muscles that results in energy expenditure" [6 p126), irrespective of whether the body moves across space, whereas everyday mobility refers to getting out and about [7]. Theoretically, physical activity and everyday mobility are clearly related constructs, but they are not identical. Whilst the capacity for physical activity is an important condition for everyday mobility, it may not be a necessary one: for instance, mobility assistive technologies and motorised transport can mitigate lack of capacity [8,9]. It is also unlikely to be a sufficient condition, given that a range of social, environmental and cultural factors, such as local transport systems, relationships, or opportunities to socialise, impinge on whether or not older adults do get out and about in their everyday lives [9,10]. Whilst biomedical research on ageing has largely focused on maintaining physical activity at older age to improve quality of life, a 'social model' of ageing also focuses on the environmental, social and cultural conditions that enable everyday mobility, for people with a range of physical capacities [7,11]. However, it is unclear empirically how far indicators of physical activity and everyday mobility can be considered to be measuring similar or distinct concepts. This study aimed to explore how far the two concepts are distinguishable using data collected in a large-scale panel survey of older adults in England, and, as a test of whether this matters or not for practical purposes, whether they were independently associated with a measure of quality of life. Specifically, our objectives were to use the English Longitudinal Study of Ageing (ELSA) to: identify whether physical activity and everyday mobility are separate constructs at younger (60–69) and/or

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older (>=70) age bands, and for men and women; derive measures of the two constructs from variables in the ELSA; and assess whether they are independently associated with quality of life (QoL).

A considerable body of clinical and epidemiological research documents the physical changes associated with ageing bodies. These include increasing rates of chronic illness, pain, sensory decline, and reduced muscle strength, which are all associated with declines in physiological capacity [2,12]. In general, at older age declines in capacity are associated with declines in physical activity [13,14], and physical activity is an important predictor of health-related quality of life [15]. Physical activity levels earlier in the lifecourse predict levels at older age [16]. Focusing on physiological mobility (in measures such as gait speed, for instance), Ferrucci and colleagues [12] have posited a model of 'functional reserve' affecting mobility trajectories. They suggest that resilience accumulates (or not) throughout the lifetime as a result of genetic predispositions, physiological factors, behavioural characteristics and life events, such that those with little 'reserve' may be more susceptible to declines in mobility from the effects of illness or functional decline. To an extent, this framing assumes an individualised and medicalised version of mobility, over-determined by physiological capacity, in which limitations and impairments are posited as the primary cause of mobility decline at older age. Policy implications are then focused largely on maintaining individual physiological capacity [12] to protect health and quality of life as people age [15].

Everyday mobility is a concept that is used in the social sciences, particularly in the transport studies, transport policy, and mobilities literatures, but less frequently used in gerontology and epidemiology, where the term 'mobility' generally refers to an individual's physiological capacity for movement [12]. Everyday mobility emphasises an individual's movement through space, whether or not that is dependent on the capacities of the physiological body. Typified by Metz [7] as 'short distance, high frequency' movements, it refers to how much people get 'out and about', whether that is through walking, driving, use of public transport, cycling or other means. Everyday mobility is also related to health and quality of life through a number of pathways. One is through the health benefits of added physical activity derived through many modes of everyday mobility [17]. However, other pathways linking mobility to quality of life do not necessarily require physical activity as mechanism. First, activities of daily living such as trips to the shops or to visit friends maintain the kinds of independence prized by many as a 'building block' [18] for quality of life at older age. Second, everyday mobility is associated with better access to the goods, services and social lives that are key determinants of health and quality of life [3, 19]. Third, there are 'immersive' benefits relating to simply being 'out and about', such as the wellbeing gains of social interaction from planned and incidental encounters with others [4,7,20]; increased feelings of social inclusion [19–22]; and the experiential pleasures of being outside the home [23,24].

Physical activity and everyday mobility are therefore related in bi-directional ways. Capacity for physical activity potentially increases the likelihood of everyday mobility, with indicators such as walk speed associated with greater everyday mobility [9], and everyday mobility contributes to maintaining physical capacity through the physical activity incurred [17,25]. However, the two do not necessarily co-vary directly, and the relationship might operate differently at different ages. First, physical activity might be a poor proxy for everyday mobility at older age. Brainard and colleagues [26], for instance, found that retirement from paid work was associated with greater physical activity for both 55–64 and 65–74 year olds in a UK cohort, but that this additional physical activity was largely derived from gardening and other leisure activity: retired older adults undertook less active travel; another UK study identified that although recreational activity increased on retirement, this was offset by a higher decline in occupational and transport activity, leading to declines in physical activity overall [27]. Second, it is possible that interventions to increase everyday mobility might reduce levels of physical activity, and vice versa: one example might be the capacity for autonomous vehicles to improve older adults' mobility [28] but reduce levels of physical activity derived from active travel. Third, aligned with a social model of ageing, declines in mobility are not solely related to physiological decline. Corran and colleagues [10], for instance, found that neither increased levels of disability nor retirement from paid work entirely accounted for reductions in travel outside the home at older age in London, UK. There is nothing 'inevitable' about age or functional decline which accounts for the reductions in everyday mobility.

Quality of life can be understood as an overarching measure of subjective well-being. Three key criteria are: 1) that it is subjective; 2) that it is not just the absence of negative factors but includes positive evaluations; and 3) that it includes a global rather than only a narrow assessment of one's life [29]. As populations increasingly enjoy longer and relatively healthy older ages, quality of life at older age is an important outcome of clinical care and public health interventions in its own right. Many indicators of quality of life are both determinants *and* consequences of everyday mobility. Frailty both causes and results from reduced mobility [30]; walking outside the home fosters the maintenance of other functional abilities [31,32] that in turn predict mobility. It is important, therefore, to have a measure of quality of life that captures dimensions that are subjectively important at older age and not its determinants or correlates, such as functional ability or health status. There are a number of measures of quality of life: here we draw on the 'CASP 19′ scale which was developed for older adults, and theoretically rooted in a 'needs satisfaction' model, focusing on four domains of importance to satisfying human needs: control, autonomy, self-realization, and pleasure [33].

2. Materials and methods

2.1. Data source

To identify whether physical activity and everyday mobility are empirically as well as conceptually separate constructs, we used data from the ninth wave of English Longitudinal Study of Ageing (ELSA), with data collection from 2018 [34]. The ELSA is a large-scale longitudinal panel study of people aged 50 and over and their partners, living in private households in England, who were born on or before February 1952. Participants have been surveyed at two-yearly intervals since 2002, with a tenth wave just completed in 2023. The original sample (of 12,099 participants) has been refreshed at several waves. The survey at each wave consists of a core self-completion questionnaire covering questions on a range of domains including family, work, health, social life, and behaviours, and each alternate wave also includes nurse-measured physical examination and blood tests [34]. The sample included 5677 individuals who completed the questionnaire; their socio-demographic characteristics are summarised in Table 1.

2.2. Measures

A number of items in the ELSA interview and questionnaire relate to physical activity, including self-report indicators of physiological mobility difficulties and the amount of physical activity undertaken (see Supplementary Material for details). In addition, at each wave, individuals over the age of sixty have been asked to complete a timed walk of 8 ft (244 cm). This measure corresponds with a deficit model of mobility in that it is a very short distance, and the data are positively skewed with a mean of approximately 3.3 s; the majority of individuals are able to complete the task in a very short time (i.e. <5 s) [See Supplementary Material, Fig. 1a and b].

There is no single battery of questions that has been designed to measure 'everyday mobility' or the propensity of individuals to be able to get out and about. In this respect within the ELSA 'everyday mobility' is less well conceptualised and measured than constructs such as well-being, quality of life and life satisfaction, which are measured using

Table 1
Sample characteristics (5677 cases) of ELSA Wave 9 respondents aged over 60.

Respondent characteristics	N of responses			
Age	5677	Mean	71.7	
		StDev	7.33	
			N	%
Gender	5677			
		Male	2533	−44.6
		Female	3144	−55.4
Self-reported long-standing limiting illness	5670			
		Yes	3336	−58.8
		No	2334	−41.1
Whether often troubled with pain	5676			
		Yes	2371	−41.8
		No	3305	−58.2
Lives with a spouse or partner	5632			
		Yes	4015	−70.7
		No	1617	−28.5
Has any children	5650			
		Yes	4867	−86.1
		No	783	−13.9
Household tenure	5656			
		Renting	733	−12.9
		Buying	4923	−86.7
Use of a car when needed driver/passenger	5677			
		Yes	5046	−88.9
		No	631	−11.1
How getting along financially	5300			
		Not managing	956	−18
		Managing well	4344	−82
Self-rated general health	5675			
		Very good or good	4221	−74.4
		Fair or Poor	1454	−25.6
Religious faith is important to respondent	5421			
		No	3174	−58.6
		Yes	2247	−41.4
How many close friends	4904			
		0 or 1	922	−18.8
		Two or more	3982	−81.2
Ethnicity	5677			
		White	5515	−97.1
		Non-white	162	−2.9

validated and established scales. However, all waves include questions on leisure-time activity, with a number of questionnaire items that relate to the likelihood of getting out and about. We therefore derived a measure from six separate short sets of questions within ELSA that can provide information about each individual's propensity to get out and about (see Tables 1–12, Supplementary Material).

On quality of life, participants in ELSA complete the validated CASP-19, a 19-item questionnaire response to measure subjective quality of life [36]. CASP-19 was specifically developed for measuring quality of life for older people [33]. It is a self-completion questionnaire spanning four derived dimensions of control, autonomy, self-realisation and pleasure. Examples of items are 'My health stops me from doing the things I want to do' and 'How often do you look forward to each day', with four-point Likert responses from 'always' to 'never'.

2.3. Analysis

Statistical analyses were carried out using IBM SPSS Statistics, version 28. An exploratory factor analysis investigated the underlying structure of available data within ELSA on individuals' physical activity and everyday mobility. Our aim was to understand whether the measures included in ELSA can be understood to map onto a single underlying construct or whether there appear to be two, or more, underlying dimensions. Factor analysis is a data-reduction technique that explores the underlying dimensions of the data by ascertaining the minimum number of hypothetical constructs that can account for the observed variation between a set of measured variables. The factor solution resulting from an exploratory factor analysis provides insights into the statistical relationships underlying the constructs of interest. These insights provide evidence for the validity of the measures operationalised through the factor scores. Further, the relationships between the factors identified and other covariates in the dataset allow us to test whether there is evidence for two separate measures of everyday mobility and physical activity that independently are associated with other variables of interest (for example quality of life) [37]. There is inevitably a trade-off between the most parsimonious solution, i.e. with the minimum number of factors, and a solution that accounts for a high proportion of the variance in the measured variables. Factor analysis ideally requires interval level data due to its dependence on correlation matrices. However, under the following conditions ordinal-level and dichotomous data can be used: (1) the analysis is primarily exploratory i.e. to identify patterns of clustering among variables (2) the underlying correlations among variables are expected to be moderate (<0.7) [38] Both conditions are met for this analysis, so we have included a number of dichotomous and ordinal-level variables as described below.

Exploratory factor analysis allows for the creation of factor scores which can be interpreted as representing the latent variables identified by the combination of variables that load onto each factor. In practical terms, factor scores were derived using SPSS v 28, and the syntax (i.e. code) used both to run the exploratory factor analysis and to calculate the scores is included as Syntax 1 in the supplementary material. In statistical terms the factor scores are calculated by using a weighted sum of the variables that contribute to each factor. The weights are included as the pattern matrix coefficients in Table 2.

The sixteen independent variables included in the exploratory factor analysis were as follows:

- How often goes to the theatre, concert or opera
- How often goes to an art gallery or museum
- How often goes to the cinema
- How often eats out of the house
- Whether has gone on a day trip or outing in the last 12 months
- Whether has taken a holiday in the UK in the last 12 months
- Whether has taken a holiday abroad in last 12 months
- Whether is a member of education, arts or music groups or evening classes
- Whether is a member of social clubs
- Whether is a member of sport clubs, gyms, or exercise classes
- Whether is a member of other organisations, clubs or societies
- Number of basic mobility difficulties (reversed coded)
- Frequency does mild sports or activities
- Frequency does moderate sports or activities
- Frequency does vigorous sports or activities
- Time taken to walk 8 ft (standardized and reversed coded)

Further details of these variables, including the distribution of responses across the cohort, are provided in Supplementary Material (Tables 1–15), and in our working paper [11]. As part of the exploratory factor analysis procedure, factor scores were saved as new variables for each individual in the study. This enabled multivariate analysis to be performed to understand more about the correlates of physical activity and everyday mobility. A multiple regression was carried out to examine how physical activity and everyday mobility are associated with quality of life for this sample of individuals aged over 60.

To check the robustness of the factor analysis model, the exploratory factor analysis was repeated for four groups defined by age group and sex (Male 60–69yrs; Female 60–69 yrs; Male 70+ yrs; Female 70+ yrs). Each of these analyses yielded very similar factor solutions such that two clear factors emerged one representing everyday mobility and one

Table 2
Factor structure matrix.

Variables from ELSA	Structure Matrix		Pattern matrix	
	Factor 1 *Everyday Mobility*	Factor 2 *Physical Activity*	Factor 1 *Everyday Mobility*	Factor 2 *Physical Activity*
How often goes to the theatre, concert or opera	0.78		0.79	
How often goes to an art gallery or museum	0.75		0.73	
How often goes to the cinema	0.72		0.7	
How often eats out of the house	0.61		0.6	
Whether has gone on a day trip or outing in the last 12 months	0.59	0.31	0.55	
Whether has taken a holiday in the UK in the last 12 months	0.51	0.3	0.47	
Whether is a member of education, arts or music groups or evening classes	0.46		0.49	
Whether has taken a holiday abroad in last 12 months	0.4	0.4	0.3	0.3
Whether is a member of other organisations, clubs, or societies	0.3		0.32	
Whether is a member of social clubs				
Frequency does moderate sports or activities		0.8		0.8
Number of basic mobility difficulties (reversed coded)		0.75		0.76
Frequency does mild sports or activities		0.61		0.64
Frequency does vigorous sports or activities		0.6		0.58
Time taken to walk 8 ft (standardized and reversed coded)		0.59		0.61
Whether is a member of sport clubs, gyms or exercise classes	0.35	0.41		0.33

representing physical activity/capability. In the analyses which follow we have therefore used the factor solution for the whole sample aged over 60 to produce the factor scores, which are then analysed using a multiple regression analysis as described below.

3. Results

3.1. Constructing measures of physical activity and everyday mobility

Factor analysis of a set of variables is only appropriate if those variables are linearly related. This can be tested using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, which is an index that compares the size of the observed correlation coefficients to the size of the partial correlation coefficients. The overall KMO measure was 0.861; relatively close to 1, suggesting a factor analysis was appropriate.

Two factors were extracted using principal components analysis, with a scree plot showing a clear break between the magnitude of the eigenvalues for the first two factors and any subsequent factors (See Fig. 2, Supplementary Material). Following extraction of the two variables, they were rotated using the Oblimin algorithm.

Table 2 presents the factor loadings for the sixteen variables that provide measures of everyday mobility, physical activity, physiological mobility problems, and walk speed. Factor 1 has an eigenvalue of 4.11 and explains 25.7 % of variance, while Factor 2 has an eigenvalue of 1.67 and explains an additional 10.5 % of variance. We have labelled Factor 1 ‘Everyday Mobility’ because it correlates strongly with self-report items relating to regular trips and excursions and with membership of organisations that require leaving the house, such as education arts or music groups. Factor 2 is labelled ‘Physical Activity’. This spans variables that represent respondents’ reported levels of physical activity, as well as what could be framed as ‘capability’ for actualised activity, such as level of physiological mobility and measured walk speed. Note that for ease of interpretation all variables have been coded such that high and positive values indicate high levels of mobility and physical capability. Overall, these two factors explain just over 36 % of the variance within the original set of 16 variables. They clearly identify two separate clusters of variables that are suggestive of two underlying constructs around everyday mobility and physical activity. It is noteworthy that two variables span these two constructs, namely membership of a sports club, gym or exercise class and whether the respondent has taken a holiday abroad in the last 12 months. Membership of a sports club or gym could certainly be understood to bridge the two concepts of physical activity and everyday mobility, which adds face validity to our factor solution, whereas taking a holiday abroad is less easy to interpret.

The component correlation matrix showed a moderate correlation of 0.34 between the two factors, which adds to our confidence that these are related *but separate* constructs. This is investigated further in the next section by using factor scores to predict quality of life.

The exploratory factor analysis was repeated separately for those aged 60–69 and those aged 70+, with similar results. In both cases the proportion of variance explained by the two factors was 35.7 %, with the correlation between the factors slightly higher for the older age group; 0.386 vs 0.259. This suggests that the dimensions of Physical Activity and Everyday Mobility can be understood as separate constructs throughout later life (Analyses available on request). The factor analysis was also repeated for men and women separately, with results similar to those for the combined sample. For men the two-factor solution explained 35.1 % of variance in comparison to 37.3 % for women, and the correlation between factors was very slightly higher for men as 0.34 compared with 0.30 for women (Supplementary Material, Tables 17 through 24).

3.3. Analysis of factor scores by age and gender

A factor score provides a single value that characterizes each individual with respect to the given factor, or underlying construct: here, to provide a measure of each individual’s level of Everyday Mobility and their level of Physical Activity. Factor scores are standardized such that they have a mean of 0 and a standard deviation of 1. Higher scores indicate higher levels of each.

An initial analysis described patterns of Everyday Mobility and Physical Activity by age and gender. As shown in Fig. 1, for Everyday Mobility women tend to score more highly than men at all ages, there is no clear decline until age 75, and this decline is relatively modest (around 0.5 Stdev in total). In contrast, for Physical Activity (Fig. 2) men tend to score more highly than women, there is evidence of decline from age 70 and this decline is more marked (around 1 Stdev). Indeed, an analysis of variance indicated that for Everyday Mobility the F score for age group was 40.0 ($p < 0.01$) whereas for Physical Activity it was 156.8 ($p < 0.01$). Gender differences in levels of Physical Activity also appear to increase slightly with increasing age; however, this interaction did not reach significance ($p = 0.061$).

3.4. Factor scores and predicting quality of life

A multiple regression was conducted primarily to investigate whether the two factors – Everyday Mobility and Physical Activity – have an independent association with quality of life (QoL) measured by the CASP-19. This would be further evidence that they can be considered as separate constructs. A further thirteen variables collected in ELSA are

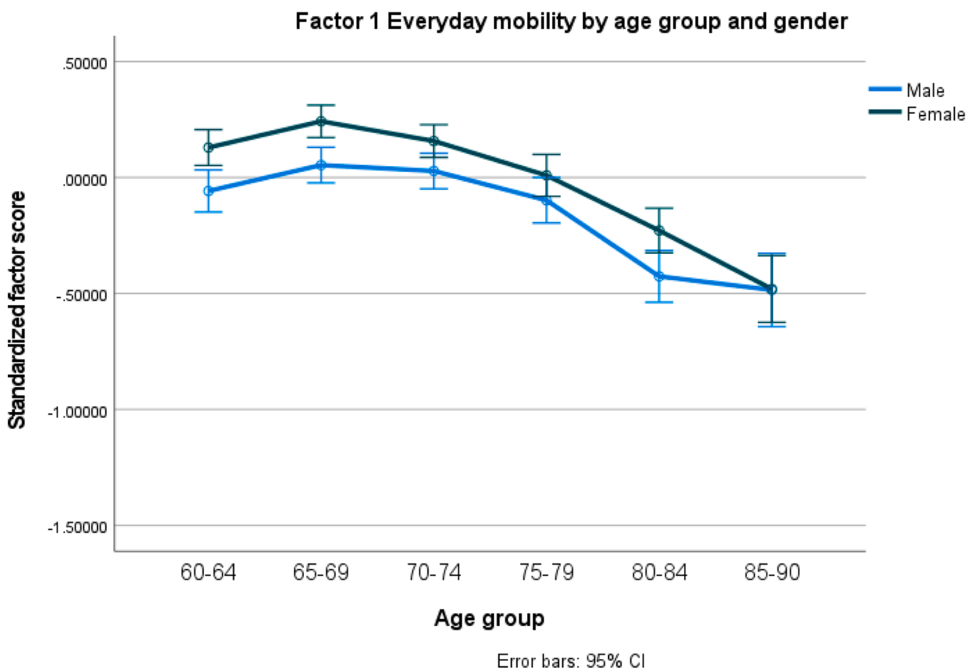

Fig. 1. Standardised factor scores for Everyday Mobility construct by age group and gender.

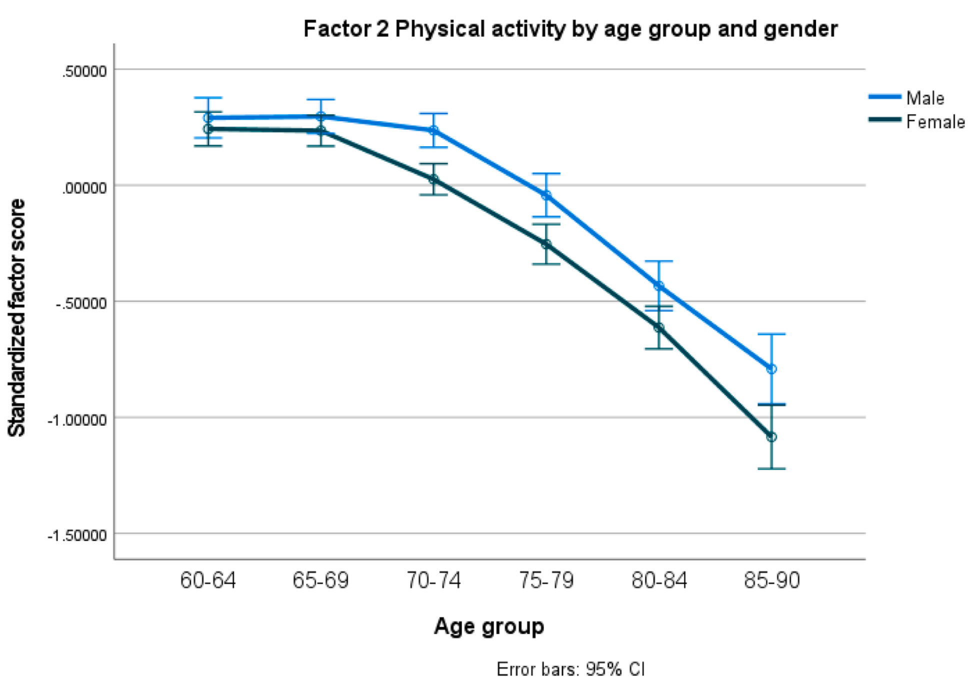

Fig. 2. Standardised factor scores for Physical Activity construct by age group and gender.

used to help characterise respondents' circumstances and are also included in the multiple regression. These are: age, gender, ethnicity, whether the respondent has a partner, whether the respondent has any children, number of close friends, importance of religious faith, household tenure (renting or buying), whether the respondent has use of a car or van when needed, how the respondent is getting on financially (having difficulties or managing well), self-reported general health (excellent, very good, and good health vs fair or poor health), whether the respondent has a long-standing illness and whether the respondent is often troubled with pain. These variables are included because they have previously been shown to have an association with Quality of Life measured using CASP-19 using an earlier wave of the ELSA study [39].

Using the multiple regression procedure in SPSS version 28, both of the factor scores (i.e. for Physical Activity and Everyday Mobility) were found independently to predict QoL. Once all fifteen variables were included in the model the total adjusted R squared was 0.355 indicating that approximately 35 % of the variability in QoL for individuals can be explained by this set of covariates. Results are shown in Table 3.

Gender, having a spouse or partner, having children, tenure, and access to a car or van do *not* have a significant association with QoL for this sample aged over 60. However, higher levels of Everyday Mobility, higher levels of Physical Activity, having two or more close friends, having no long-standing illness, no pain and no financial difficulties are significantly associated with *higher* quality of life. In contrast, being

Table 3
Multiple regression with dependent variable QoL (CASP-19).

	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	95.0 % Confidence Interval Lower Bound	Upper Bound
(Constant)	59.994	1.132		57.774	62.214
Factor 1: Everyday mobility	**0.954**	**0.104**	**0.124**	**0.75**	**1.159**
Factor 2: Physical activity	**1.449**	**0.127**	**0.181**	**1.2**	**1.698**
Age (years)	**−0.085**	**0.014**	**−0.079**	**−0.113**	**−0.057**
Gender (Ref. Female)	0.245	0.196	0.016	−0.139	0.629
Self-reported long-standing illness (Ref. none)	**−1.312**	**0.21**	**−0.085**	**−1.724**	**−0.899**
Whether often troubled with pain (Ref. no)	**−1.439**	**0.209**	**−0.093**	**−1.849**	**−1.03**
Whether has a husband, wife or partner with whom they live (Ref. no)	0.394	0.229	0.024	−0.056	0.844
Whether the respondent has any children (Ref. no)	−0.319	0.27	−0.015	−0.85	0.211
Household tenure (Ref. renting)	0.493	0.318	0.021	−0.13	1.115
Whether respondent has use of car or van when needed, as a driver or a passenger (Reference 'no')	0.254	0.339	0.01	−0.411	0.92
How getting along financially (Reference 'having difficulties')	**3.041**	**0.262**	**0.148**	**2.528**	**3.554**
Self-reported general health (Reference 'good health')	**−4.096**	**0.265**	**−0.228**	**−4.615**	**−3.576**
Religious faith is important to respondent (Reference 'no')	0.371	0.196	0.024	−0.012	0.755
How many friends close relationship recoded (Reference '0 or only 1')	**1.734**	**0.243**	**0.089**	**1.257**	**2.21**
Ethnicity recoded (Reference 'white')	−0.955	0.582	−0.02	−2.096	0.186

older and having poor self-reported health is associated with reduced self-reported QoL. This multivariate analysis suggests that Physical Activity and Everyday Mobility can be considered as separate constructs that are independently associated with quality of life even when a range of other contextual variables are included.

4. Discussion

Using Wave 9 of ELSA, we have developed composite measures of two constructs, which we call Physical Activity and Everyday Mobility. Physical Activity can be derived as a composite from ELSA variables: frequency of mild, moderate and vigorous sports or activities, number of basic mobility difficulties, time to walk 8 ft and membership of sports clubs or exercise classes; Everyday Mobility can be derived from: frequency of going to the theatre, concert or opera, frequency of going to a gallery or museum, frequency of going to the cinema, frequency of eating out, whether has gone on a day trip, holiday in the UK or holiday abroad in the last 12 months, and whether is a member of other organisations clubs and societies. These composite measures can be used by researchers drawing on ELSA and comparable cohort studies collecting similar variables [35] to assess the impact of interventions aiming to improve quality of life and other outcomes. Although subsequently Wave 10 of ELSA included direct measures of physical activity (from accelerometers), evidence from other community surveys suggest not only significant rates of non-adherence, but that non-adherence is likely to systematically exclude lower income, less healthy participants (see e.g. Cato et al. 2020 [40]). Self- report measures of physical activity and mobility are therefore likely to continue to be needed for large community samples, and we have demonstrated the utility of these composite measures.

An exploratory factor analysis demonstrated that the ELSA variables capture related constructs of Physical Activity and Everyday Mobility. These appear to be separate constructs, which are independently associated with QoL at older age. This holds across gender, and for both the younger participants in the cohort (60–69) and those 70 and older.

The ELSA is a large, representative, cohort of older adults in England, and uses measures harmonised with other national surveys [35]; our findings are likely to be generalizable to similar samples. However, our analysis was limited by the variables measured in the surveys, which are less detailed on everyday mobility, and reliant on self-report. Further research might use alternative measures of everyday mobility (e.g. from accelerometer or GPS data) to assess how far changes in self-report are associated with ageing or gender. There are also limits in terms of generalisability. As the above discussion suggested, the relationships between capacity for physical activity and everyday mobility are context-dependent. For instance, in settings where there are fewer opportunities or resources to mitigate the implications of limited capacity, then the two constructs might be empirically undistinguishable. Comparison with analysis of similar cohorts would be useful to assess how far everyday mobility and physical activity are separate constructs in other populations.

5. Conclusions

The literatures on capacity for physical activity and everyday mobility at older age are rather distinct: whereas clinical gerontology focuses on physical activity and its maintenance at an individual level [2,12], public health policy research tends to address everyday mobility, and the transport-system and environmental conditions that foster this [4,17,19]. The two constructs are clearly related, but it was unknown how far they overlapped. This study has identified the value in attending to both, and demonstrated that, in a representative population of English older adults, the two constructs are independently related to Quality of Life. The need to attend to both everyday mobility and physical activity suggests a 'social model' of ageing, in which the determinants of quality of life are influenced by wider social, cultural and environmental factors as well as the physiological and psychological individual factors that contribute to capacity for physical activity. Both are important, and this has implications for both policy and research on healthy ageing.

For policy, the implications are that promoting healthy ageing entails more than fostering individual physiological and psychological capacities. Quality of life also depends on opportunities for everyday mobility, which neither necessarily nor inevitably flow from capacity for physical activity, but depend also on the provision of services, environments and opportunities that enable older adults to get out and about. There are, in short, likely to be interventions other than clinical ones addressing the individual, ageing body that might foster greater everyday mobility at older age, including transport provision, social support and accessible environments. For researchers evaluating the impacts of interventions for healthy ageing, it will be important to assess implications for both physical activity and everyday mobility, as these are related, but not identical, constructs. Interventions that foster one of these will not necessarily foster the other.

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Jane Elliott: Writing – original draft, Methodology, Formal analysis, Conceptualization. **Judith Green:** Writing – original draft, Methodology, Conceptualization.

Declaration of competing interest

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ahr.2024.100204.

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