



Assessing changes in neighbourhood satisfaction among older age adults in England using the English Longitudinal Study of Ageing

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ABSTRACT

Scholars from a variety of disciplines have become interested in neighbourhood satisfaction as a gateway to understanding relationships between 'neighbourhood factors', 'individual characteristics' and 'neighbourhood perceptions' in shaping residents' attitudes to their local area. As recent studies have emphasised, the global search for 'age-friendly cities' prompts exploration of the drivers of change in neighbourhood satisfaction that could be critical to delivering targeted policy interventions to help improve physical and mental health and subjective wellbeing of older age adults. This study uses a growth curve model to examine associations between change in neighbourhood satisfaction over time and factors such as neighbourhood deprivation, social engagement, relationship status, health and wellbeing and socioeconomic status using data from the English Longitudinal Study of Ageing, 2002-03 to 2014-15. The study finds, in line with previous empirical research, that neighbourhood deprivation is a key associate of neighbourhood satisfaction, but also the role of moving status, social activity, relationship status, quality of life, age, sex and country of birth are contributing factors. The findings suggest policymakers and public health professionals need to focus on a combination of short- and long-term, area-based and people-focused policies to address structural inequalities and deprivation to improve neighbourhood satisfaction. Policy interventions should especially focus on addressing the needs of vulnerable groups of older age adults including those who have recently moved, disengage with social activities, living alone, with lower levels of mental wellbeing, older, male, born abroad and living in areas of higher levels of neighbourhood deprivation.

Introduction

Improving health and wellbeing of older persons is intrinsically important, but also valuable for social cohesion. Although there are a diversity of experiences and needs amongst older adults, improving neighbourhood satisfaction has been found to be a critical component in fostering shifts to 'age-friendly cities' (Fong et al. 2021; Gan et al. 2021). This is an area of both epidemiological and broader public policy interest as it can potentially influence wider emphasis of decision-makers at the confluence of population health and the built environment. In the past, key factors that have emerged as critical have included access to services, walkability, and levels of deprivation (Patterson and Chapman, 2004; Smith et al., 2004), while more recently focus on 'built environment characteristics' including access to green open spaces and their impact on population ageing has increased (Burton et al., 2011). For example, Sugiyama et al. (2009) find access to quality open spaces has a positive correlation with physical behaviour (i.e., walking, and psycho-social wellbeing amongst older adults). Factors such as levels of social exclusion (Walsh et al., 2017), ethnicity (Knies et al., 2016) and neighbourhood deprivation (Godhwani et al., 2019) continue to be of interest, alongside socio-demographic and health-related determinants (Prieto-Flores et al., 2012).

Yet, a missing link in the literature is in identifying which factors affect changes in neighbourhood satisfaction over time, and hence contribute significantly to improvements/deterioration in overall levels of neighbourhood satisfaction. In the broad-ranging theoretical and empirical literature on neighbourhood satisfaction assessing change over time is a vital component. For example, as Jacobs et al.'s (2009) article, highlights built environment characteristics— both at neighbourhood and individual scale— can significantly impact upon health and wellbeing across the life course. The main objective of this paper is to empirically examine the relationship between determinants of change in neighbourhood satisfaction. The paper uses data from the English Longitudinal Study of Ageing (ELSA) and its multi-dimensional information on older age adults in England. For the purposes of this paper, neighbourhood refers to a local area within 20 min' walk or a mile from a person's home; while older persons are those aged 50 and over (Nat-Cen, 2006).

Neighbourhood measures of quality can be measured both objectively through characteristics about the area, or through subjective measures, such as through individual attitudes toward a local area. In this context, neighbourhood satisfaction (Corrado et al., 2013) can be deployed to understand how older people engage with their local neighbourhood environments. Although there has been ongoing

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research in the field in related topics, an identified research gap is the lack of work using longitudinal data to assess changes in neighbourhood satisfaction. While recent work by Godhwani et al. (2019) has explored objective and subjective measures of neighbourhood deprivation and its association across different ELSA waves with changes in health status and self-reported health among older adults in England, there have been very few other studies that have looked at changing neighbourhood satisfaction among older adults, especially from a population health perspective. This therefore presents a key aspect of novelty in this study, both conceptually and methodologically.

In the search for better health and wellbeing for ageing populations, neighbourhood satisfaction has come to be seen as a key indicator of 'strong and sustainable communities' (Baum et al., 2010). Over the last ten years, academics from a variety of disciplines have become interested in neighbourhood satisfaction due to relationships between 'neighbourhood factors', 'individual characteristics' and 'neighbourhood perceptions' (Neal, 2020). Typified by analysis of survey questions such as 'How satisfied are you with your neighbourhood?', the assumption of recent modelling has been that neighbourhood satisfaction is the result of structural, socio-economic, and demographic features affecting local populations (Parkes et al., 2002; Greif, 2009; Lee et al., 2017). Shaped by literature from the 1980s and 1990s on the impacts of residential stability, ethnic diversity, and socio-economic status, the focus has since shifted to measuring the impacts of household and neighbourhood characteristics on resident's reported satisfaction (Hipp, 2010). While Permentier et al. (2011) suggest factors such as residential mobility (years lived in residence) and general wellbeing of residents can be affected by perceptions of neighbourhood reputation, Greif (2015) comments on how 'tenure status' (i.e., levels of homeownership), racial divisions and neighbourhood context all shape the desirability and liveability of neighbourhoods.

To create 'age-friendly neighbourhoods', Gory et al. (1985) suggest the existence of an 'ecology of ageing', whereby neighbourhood satisfaction among older age adults' results from complex processes that involve both objective and subjective measures of neighbourhood satisfaction. Wahl et al. (2012) argue 'ageing well' requires recognition that even within the same neighbourhood residents may not share the same 'environmental worlds'. Bowling and Stafford (2007) suggest for those living in more affluent neighbourhoods and with better neighbourhood perceptions, there is greater likelihood of engagement in social activities in older age. Loneliness amongst older adults is particularly linked to small social and family networks, poor mobility and social participation, alongside poor perceptions of street connectivity, crime and traffic safety which affects physical activity (Maisel, 2016; Kemperman et al., 2019). Björk et al. (2008), examining recreational values of the close natural environment in Southern Sweden, find strong associations with neighbourhood satisfaction and physical activity differentiated by tenure status. Temelová and Slezáková (2014) argue, using the example of neighbourhood satisfaction in socialist high-rise housing estates in Prague, that life satisfaction is shaped by residential environment and individual circumstances such as ability of individuals to move and adapt to new places.

Differences in approaches to measuring neighbourhood satisfaction are highlighted in three studies. In Zhang et al.'s (2019) study using a sample of 1029 adults selected from 34 communities in Guangzhou, China, high-resolution remote sensing images and points-of-interest (POIs) data is used alongside survey data to assess differences between objective and subjective measures of health and wellbeing. Ruiz et al.'s (2019) study used a smaller sample of 252 residents from five different neighbourhoods of the island of Tenerife, Spain, but collected more detailed data on quality of life, life orientation, neighbourhood perception, residential satisfaction, and reasons for living in the neighbourhood. Meanwhile, Godhwani et al.'s (2019) study used data from ELSA, comprising of 11,391 respondents born before 29 February 1952, alongside the Index of Multiple Deprivation (IMD) to provide proxy data for calculating neighbourhood dissatisfaction scores. These highlight

divergent ways of researching neighbourhood satisfaction and deploying qualitative and quantitative research methods to address key knowledge gaps that currently exist with regards to its linkages with population ageing.

In summary, explanatory variables including residential stability, relationship status, social engagement, housing tenure, health and wellbeing and neighbourhood deprivation are understood to be plausible determinants of neighbourhood satisfaction among older age adults, when controlling for demographic and socioeconomic characteristics. The research question this paper aims to address is which of these are determinants of *change* in neighbourhood satisfaction over time.

Methods

Data

The English Longitudinal Study of Ageing (ELSA) was used for its specific benefits as a prospective population-based panel study, which allows in-depth exploration of change in population characteristics over time. Since ELSA started in 2002, it has collected information through face-to-face interviews and self-completion questionnaires on a biannual basis on demography, physical health and behaviours, psychosocial wellbeing, economic life, life expectations, and cognitive function and abilities (Stephoe et al., 2013; ELSA, 2021). The sample includes people aged 50 and over and their partners, living in private households in England. The baseline sample members were taken from households that had previously taken part in the Health Survey for England between 1998 and 2001. Sample members who moved into a residential care home or similar institution were followed up. Self-completion questionnaires were issued and returned by respondents who completed a face-to-face interview at each point of data collection. In this paper, ELSA was particularly useful for analysing neighbourhood satisfaction and deprivation as it contains broad information on life satisfaction, housing and tenure, socio-demographic characteristics, and health-related indicators such as quality of life.

This paper specifically uses data from wave 1 (2002-03), wave 3 (2006-07) and wave 7 (2014-15), because respondents were only asked about their attitudes towards their neighbourhood in these waves. ELSA also has the added value of being linked to the Index of Multiple Deprivation (IMD) at each wave, which provided additional information on seven domains of neighbourhood deprivation, including income deprivation; employment deprivation; health deprivation and disability; education, skills, and training deprivation; barriers to housing and services; living environment deprivation; and crime (Payne and Abel, 2012). The linked data is potentially disclosive and therefore was made accessible through a Special Licence application approved by the UK Data Service (NatCen, 2019; Oldfield et al., 2020).

Measures

The outcome variable was neighbourhood satisfaction at waves 1, 3 and 7. Neighbourhood satisfaction is calculated by creating composite scores, which summarise information on nine aspects including feelings of belonging; vandalism and graffiti; loneliness; trust; safety after dark; friendliness; fairness; area cleanliness; and having people to help you. These neighbourhood attitudes were collected at selected waves through self-completion questionnaires (NatCen, 2002; 2006; 2014). For each item, respondents were asked to rate their area out of 7, adding up to a maximum score of 63, with higher scores indicating greater levels of neighbourhood satisfaction (reverse recoding was used to make sure all responses were in the same direction).

The explanatory variables were measured at wave 1 using data from face-to-face interviews unless otherwise described. Neighbourhood Deprivation (measured as five quintiles of deprivation (based on the Index of Multiple Deprivation (Ministry of Housing, Communities &

Local Government, 2015)) was used from data collected at the Lower Super Output Area level. Residential stability was measured using a binary indicator determining whether a respondent had moved their place of residence between wave 1 and wave 7 as well as the number of years they have lived at the current residence at wave 1. Social engagement was measured using eight aspects of engagement in community-level social activities. Self-completion questions were asked about participation in political parties, trade unions, environmental groups; tenant’s or resident’s groups, or neighbourhood watch; church or other religious groups; charitable organisations; education, arts, or music groups, or participation in evening classes; social clubs; sports clubs, gyms, participant in exercise classes; and any other organisations, clubs, or societies. Using a similar approach to McHugh-Power et al.’s (2019), the responses were collated to create a composite social engagement score of 0, 1, 2 or 3 or more activities. Relationship status was categorized as married, in a couple, separated, divorced, widowed

or single and never married. Health and wellbeing was measured through the CASP-19 quality of life scale and level of physical activity. CASP-19 domains score summarizing a respondent’s control, autonomy, pleasure and self-realization were summed on a scale of 0 to 57 from items asked in a self-completion questionnaire (CASP-19, 2021; Rafns-son et al., 2015; Wiggins et al., 2008; Bowling, 2009). Level of physical activity was measured by the amount of activity in occupation, if working, and recreational activity and categorised as low or sedentary, moderate, or high. Socio-economic status was measured by educational level (by highest level of qualification), non-pension wealth categorised into quintiles and housing tenure collapsed into outright ownership, ownership with a mortgage, and renting. Individual demographic characteristics included a respondent’s age at wave 1, 3 and 7 (between 50 and 99), sex (male or female), ethnicity (white or other), and country of birth (UK born or non-UK born).

The study sample included 11,391 ELSA respondents who entered

Table 1
Sample characteristics by wave

	Wave 1 (n=11,391)		Wave 3 (n=7,535)		Wave 7 (n=4,894)		Total (n=23,820)	
	Mean (SD) or % ¹	Mis. (%) ²	Mean (SD) or % ¹	Mis. (%) ²	Mean (SD) or % ¹	Mis. (%) ²	Mean (SD) or % ¹	Mis. (%) ²
Neighbourhood satisfaction	47.7 (9.00)	83.6%	48.5 (8.89)	81.6%	49.6 (9.00)	79.7%	48.3 (9.00)	82.18%
<i>IMD quintile</i>		100.0%		100.0%		100.0%		100.00%
1	22.4%		24.0%		26.0%		23.6%	
2	23.1%		24.1%		25.6%		23.9%	
3	20.5%		20.7%		20.2%		20.5%	
4	18.6%		17.8%		16.9%		18.0%	
5	15.4%		13.5%		11.2%		13.9%	
Moved waves 1-7	13.6%	98.2%	18.1%	98.5%	21.3%	98.5%	16.6%	98.33%
Year live at current address	21.0 (14.39)	99.3%	20.6 (14.09)	99.6%	19.6 (12.74)	99.7%	20.6 (13.98)	99.48%
<i>Social activities</i>		86.6%		90.9%		92.3%		89.14%
0	30.8%		27.6%		23.5%		28.3%	
1	28.9%		28.2%		28.5%		28.6%	
2	19.4%		20.6%		21.5%		20.2%	
3+	20.9%		23.6%		26.5%		22.9%	
<i>Relationship status</i>		100.0%		100.0%		100.0%		100.00%
Married	64.9%		65.7%		70.9%		66.4%	
Cohabiting	3.4%		3.6%		4.2%		3.6%	
Separated	1.8%		1.9%		1.8%		1.9%	
Divorced	6.9%		7.5%		7.7%		7.3%	
Widowed	17.7%		16.3%		11.1%		15.9%	
Single	5.2%		4.9%		4.2%		4.9%	
CASP-19	42.5 (8.68)	81.6%	43.0 (8.32)	86.4%	43.8 (7.94)	88.7%	43.0 (8.43)	84.59%
<i>Physical activity</i>		98.3%		99.2%		99.2%		98.79%
Sedentary or low	32.7%		28.4%		22.6%		29.3%	
Moderate	48.6%		51.0%		53.7%		50.4%	
Vigorous	18.7%		20.6%		23.8%		20.3%	
<i>Household tenure</i>		99.5%		99.7%		99.8%		99.64%
Own outright	54.6%		56.0%		55.1%		55.1%	
Own with mortgage	24.8%		26.6%		31.0%		26.7%	
Renting	20.6%		17.3%		13.8%		18.2%	
<i>Household wealth quintile</i>		98.2%		98.3%		98.2%		98.27%
1	20.0%		16.7%		12.6%		17.5%	
2	20.0%		18.9%		16.8%		19.0%	
3	20.0%		20.5%		21.1%		20.4%	
4	20.0%		21.4%		23.3%		21.1%	
5	20.0%		22.5%		26.1%		22.0%	
<i>Highest qualification</i>		99.7%		99.9%		99.9%		99.81%
Degree	10.8%		12.7%		15.1%		12.3%	
Higher ed below degree	10.8%		12.4%		14.0%		12.0%	
A level or equivalent	6.0%		6.7%		7.3%		6.5%	
GCE or equivalent	15.5%		17.0%		19.8%		16.9%	
CSE or equivalent	4.9%		4.5%		4.1%		4.6%	
Foreign	8.5%		8.5%		8.1%		8.5%	
No qualifications	43.5%		38.3%		31.6%		39.4%	
Age	65.3 (10.93)	100.0%	64.1 (10.13)	100.0%	61.2 (8.14)	100.0%	64.1 (10.28)	100.00%
Sex		100.0%		100.0%		100.0%		100.00%
Male	46.3%		45.7%		45.4%		46.0%	
<i>Country of birth</i>		99.3%		99.6%		99.7%		99.48%
Overseas	7.1%		6.1%		6.5%		6.6%	
<i>Ethnicity</i>		99.3%		99.7%		99.5%		99.48%
Not white	2.9%		2.2%		2.4%		2.6%	

¹ Sample characteristics of valid respondents (ie. non-missing sample)
² Percentage respondents for a variable of total survey wave sample size.

the survey at wave 1 as core members (i.e., those aged 50 and over who the sample is considered to be representative of). A decision to exclude respondents who entered the study after wave 1 was taken due to the fact they would have complete missing data at wave 1 when most of the explanatory variables were measured. A decision not to impute values for non-response due to attrition between waves was taken because information is not available on the reason for drop out (e.g., death, emigration, refusal, etc). The longitudinal attrition between waves was substantial with 7,535 (66% of original sample) respondents at wave 3 and 4,894 respondents at wave 7 (42% of original sample). Sample weights (UK Data Service, 2021) are used to ensure the estimates are representative from wave 1 in the descriptive and statistical analysis. Table 1 shows the survey weighted complete case sample characteristics of each variable at waves 1, 3 and 7. The table shows respondents were more likely to have moved, have lower number of years at current address, be more engaged in social activities, be married or cohabiting, own their housing with a mortgage, have a higher CASP-19 score, do regular moderate or vigorous physical activity, be living in a less deprived neighbourhood, be younger, be wealthier and have higher level qualifications among those responding at wave 7 compared with wave 1. This indicates the bias in attrition given these characteristics were only measured at wave 1.

Item-missingness for respondents who responded at each wave were imputed using multiple imputation by chained equations (10 imputed datasets) using all variables in the model of interest as well as the survey weights at wave 1 as an auxiliary variable. The variables with the greatest item non-response were those captured in the self-completion questionnaire. Neighbourhood satisfaction, the only time varying variable in Table 1, was completed by 84% of respondents at wave 1, 82% of respondents at wave 3 and 80% of respondents at wave 7. The item non-response in the other self-completion captured variables at wave 1, social engagement and CASP-19 were available for a higher proportion of respondents in wave 3 compared with wave 1 and in wave 7. The missingness in these variables ranged from 8 to 18%.

Statistical analysis

This study deploys a multilevel growth curve model where survey responses at waves 1, 3 and 7 are nested within respondents. The random variance terms for each wave are allowed to be different in a model where the third level is respondents, the second level is wave and the first level is a single respondent within a single wave. The only effects at level 1 are the random effects for wave. The fixed effect for wave is in the model at level 2. The model can be written as:

$$nsat_{itk} = b_0 + bX * x_{.i} + b1 * wave_{.it} + u_{.i} + e_{.i1} * t1 + e_{.i2} * t7 + r_{.it0}$$

Where the level one random variance for wave 3 is represented by r_{it0} . The random effects e_{i1} to e_{i2} are dummies variables for waves 1 and wave 7 and represent the difference to the random variance at wave 3. $u_{.i}$ is the random intercept across respondents (i.e., the level 3 variance). $B1$ is a fixed effect for wave at level 2 and bX is a set of covariates at level 3. The models were fitted using the *mixed* command in Stata 15.

The model was tested for multicollinearity using the variance inflation factor test. Non-pension wealth was shown to have high multicollinearity and therefore was excluded from the model of interest. Statistically significant estimates are described as $p < 0.05$.

Results

Table 1 shows the mean neighbourhood satisfaction score increased from 47.7 at wave 1 to 48.5 at wave 3 and to 49.6 at wave 7. For variables measured at wave 1, a third of respondents were living in the 40% most deprived neighbourhoods, 13.6% moved residence between waves 1 and 7, the mean number of years at the current residence was 21 years,

a majority (69.2%) were engaged with at least one social activity, with more than a fifth engaged in at least three, a majority were married (64.9%), the mean CASP-19 score was 42.5, a majority engaged in moderate or vigorous physical activity (67.3%) and lived in an owner-occupied residence (79.4%), 43.5% had no qualifications, the mean age was 65.3, the majority were women (54%), 7.1% were born abroad and 97.1% were white.

The fixed effect model results, presented in Table 2, show an increase in the neighbourhood satisfaction score of 0.26 (95% CI; 0.22, 0.31) for each later wave of ELSA, holding constant all other variables. There was significant random variance around this change which was smallest at wave 3 (5.70) and largest at wave 7 (5.70 + 3.24).

Table 2 Growth curve model of change in neighbourhood satisfaction

	Coef.	Std. Err.	95% CI
Fixed effects			
Wave	0.263	0.024	0.216, 0.31
IMD quintile (ref. least deprived)			
8.35 - 13.72	-0.027	0.205	-0.430, 0.376
13.72 - 21.16	-0.877	0.223	-1.315, -0.439
21.16 - 34.21	-3.002	0.267	-3.530, -2.474
34.21 - 86.36 [most deprived]	-4.381	0.308	-4.992, -3.77
Years lived at address	-0.001	0.006	-0.013, 0.011
Move between waves 1-7 (ref. not moved)			
Moved	-0.408	0.204	-0.808, -0.007
Social activities (ref. none)			
1	0.028	0.210	-0.385, 0.442
2	0.478	0.239	0.005, 0.952
3+	0.519	0.233	0.060, 0.977
Relationship status (ref. married)			
Cohabit	-0.028	0.384	-0.782, 0.726
Separated	-0.635	0.619	-1.857, 0.587
Divorced	-1.185	0.311	-1.796, -0.575
Widowed	-0.531	0.261	-1.048, -0.015
Single	-1.516	0.377	-2.258, -0.773
CASP-19	0.260	0.010	0.240, 0.281
Physical activity (ref. sedentary or low)			
Moderate	-0.322	0.181	-0.678, 0.034
High	-0.017	0.229	-0.466, 0.432
Household tenure (ref. owned outright)			
Mortgaged	-0.268	0.188	-0.637, 0.102
Renting	-0.388	0.229	-0.839, 0.062
Highest qualification (ref. degree)			
Higher ed below degree	0.091	0.287	-0.473, 0.655
NVQ3/GCE A Level equiv	-0.372	0.352	-1.063, 0.319
NVQ2/GCE O Level equiv	0.055	0.281	-0.497, 0.608
NVQ1/CSE other grade equiv	0.271	0.423	-0.562, 1.104
Foreign/other	-0.271	0.326	-0.911, 0.369
No qualification	0.150	0.271	-0.383, 0.682
Sex (ref. female)			
Male	-0.583	0.158	-0.892, -0.273
Age	0.112	0.010	0.092, 0.131
Country of birth (ref. UK)			
Overseas	-1.130	0.399	-1.916, -0.344
Ethnicity (ref. white)			
Not white	0.511	0.600	-0.670, 1.692
Constant	31.24	0.813	29.65, 32.84
Random effects			
$u_{.i}$ (respondent)	5.735	0.077	5.586, 5.888
e_{i1} (wave 1)	2.387	0.289	1.881, 3.03
e_{i3} (wave 7)	3.238	0.284	2.725, 3.848
r_{it0} (wave 3)	5.703	0.090	5.529, 5.883

Notes: fixed effect estimates statistically significant at the 95% level are shown in bold.

The relationship between neighbourhood deprivation and neighbourhood satisfaction showed poorer neighbourhood satisfaction for those living in more deprived areas at wave 1. For example, living in a neighbourhood with a deprivation score in the 20% most deprived areas compared with the 20% least deprived was associated with a neighbourhood satisfaction of -4.38 (95% CI; -4.99, -3.77). The difference to the 60% most deprived areas compared with the 20% least deprived was statistically significant.

Whether a respondent moved between wave 1 and wave 7 was associated with a lower neighbourhood satisfaction score of -0.41 (95% CI; -0.81, -0.01) compared with those who did not move. The number of years lived at current address in wave 1 was not significantly associated with neighbourhood satisfaction.

Engagement with many social activities (i.e., three or more) was associated with a higher neighbourhood satisfaction score of 0.52 (95% CI; 0.06, 0.98) compared with those who were not engaged in any social activities. Being single and never married (-1.52 [95% CI; -2.23, -0.77]), divorced (-1.12 [95% CI; -1.79, -0.58]) and widowed (-0.53 [95% CI; -1.05, -0.02]) was associated with a lower neighbourhood satisfaction score compared with those who are married.

CASP-19 scores were also found to have a statistically significant association with respondent's level of neighbourhood satisfaction. A unit increase in CASP-19 was associated with a 0.26 (95% CI; 0.24, 0.28) increase in neighbourhood satisfaction. There was no association between physical activity and neighbourhood satisfaction.

Age, sex and country of birth were all significant predictors of neighbourhood satisfaction. A one-year increase in the respondent's age at each wave was associated with an 0.11 (95% CI; 0.09, 0.13) increase in neighbourhood satisfaction. Being male as opposed to female resulted in -0.58 (95% CI; -0.89, -0.27) decrease in neighbourhood satisfaction. Those born overseas as opposed to in the UK had a -1.13 (95% CI; -1.92, -0.34) decrease in neighbourhood satisfaction. There was no significant difference in neighbourhood satisfaction by ethnic group. There was also no statistically significant association between neighbourhood satisfaction and both level of qualification and tenure status.

Discussion

This paper makes a novel contribution by looking at neighbourhood satisfaction longitudinally using a nationally representative study that includes a wealth of measures shown to be associated with neighbourhood satisfaction. The paper suggests that neighbourhood deprivation is the key channel through which neighbourhood satisfaction changes over time, in line with [Godhwani et al. \(2019\)](#). Fixed demographic characteristics such as age, sex, and country of birth are also associated with neighbourhood satisfaction as well as potentially modifiable risk factors such as level of social engagement, relationship status and quality of life. Whether a respondent moved was also associated with neighbourhood satisfaction. While the literature suggests that socio-economic factors such as tenure status, wealth and education are predictors of neighbourhood satisfaction ([Greif, 2015](#); [Walsh et al., 2017](#)), this was not found to be the case in this paper and nor was physical activity ([Björk et al., 2008](#); [Maisel, 2016](#)).

The difference between the neighbourhood satisfaction for respondents living in the most deprived compared with the least deprived neighbourhoods was equivalent to the combined difference between the most extreme categories of moved status, level of social engagement, relationship status, sex and country of birth. The estimate was also similar to the difference at the extremes of the age distribution and the difference between the inter-quartile range of the CASP-19 scores. This suggests a fragility of neighbourhood satisfaction in more deprived neighbourhoods as perceived expectations regarding belonging, vandalism and graffiti, loneliness, trust, safety after dark, friendliness, fairness, area cleanliness and having people to help you can deteriorate faster compared with less deprived neighbourhoods.

The insufficient evidence of an association to socioeconomic status

could reflect a stronger effect of neighbourhood deprivation in older age because measures of tenure status and education were statistically significant predictors of neighbourhood satisfaction when neighbourhood deprivation was not included in the model (analysis not shown here). It could be the case that more affluent older people are more concentrated in less deprived neighbourhoods compared with their younger peers and therefore neighbourhood deprivation confounds the relationship between certain individual measures of socio-economic status and neighbourhood satisfaction. Further research should explore the socio-economic determinants of neighbourhood satisfaction in greater detail.

The contradiction to previous research in terms of the association to physical activity may reflect two differences in the current study. Firstly, measurement of physical activity included in the current study refers to activity done in main job or participation in sports or activities. It could be the case that many older people who are not sedentary in their daily activities actually walk to the shops, for example, report sedentary physical activity in their job or do not have a job or in the activities they take part in. Another reason for the lack of association between physical activity and neighbourhood satisfaction may reflect the measurement of the outcome in the current study which is broader than perceptions of the local built environment. The neighbourhood satisfaction measure used in the current study incorporates a broader measure of community cohesion ([Finney and Jivraj, 2013](#)).

There are limitations that this study should be set against. There is little doubt the model in this paper suffers from omitted variable bias as there are unmeasured factors that contribute to variation in neighbourhood satisfaction. Further research should look to theorise these. There is also a question whether the ELSA sample can be generalised to the population it aims to represent. For example, the sample respondents are more likely to be owners and white compared with the national estimates from the 2001 Census ([NatCen, 2002](#)). This is overcome to some extent by using the sample weights provided with the ELSA data.

The main policy implication of this study is ensuring greater equality of neighbourhood quality. This could ensure older people are equally satisfied with the places they live. This could be achieved through area-based interventions that aim to create age-friendly spaces. This need not simply be achieved directly through making adaptations that make spaces friendly for older people, but interventions that tackle structural disadvantages that themselves will reduce the likelihood of neighbourhood anti-social behaviour and increase sense of neighbourhood belonging. Other determinants of better neighbourhood satisfaction could be improved for their own purpose as well as their potentially indirect effect on neighbourhood satisfaction (e.g., individual quality of life and social engagement). Policies that aim to encourage new social engagement and sustain existing social engagement in older age are well documented ([Jivraj et al., 2016](#)). Older people could also be encouraged to interact with the places they live in a positive light, including those who have recently moved, the oldest old, men, those born abroad and those who are single. Supporting public, private and third-sector organisations who target these types of individuals could ensure they feel better about the neighbourhoods they live in.

Conclusions

This study shows that neighbourhood satisfaction among older age adults in England is strongly associated with neighbourhood deprivation. Other modifiable and fixed characteristics predict changes in neighbourhood satisfaction including greater social engagement, availability of a domestic spouse, higher quality of life, being younger, being female and being born in the UK. The study emphasises that the ambition of creating 'age-friendly cities' requires a focus on a combination of short- and long-term area-based and people-focused policies to address both structural inequalities and deprivation affecting neighbourhood satisfaction among older age adults.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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