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Abstract

As the population in Western countries becomes older, providing transportation able to meet travel needs during later life will become more challenging, especially due to the heterogeneity and differences in background, health and travel patterns of that population. Given the importance of the link between the ability to be mobile and use transportation with individuals' wellbeing, this study investigates the factors which influence the fulfilment of travel needs amongst the older population. The study employs a conceptual framework based on five interrelated domains that shape and influence out-of-home travel needs during later life. The results indicate that access to the car, especially as a driver, and individuals' health and wellbeing conditions are the two main factors affecting the fulfilment of travel needs with regards to both realised mobility and unmet travel needs. Around one-third of the respondents reported the need to undertake more out-of-home activities than they do, particularly older women. Activities reported more in this sense were those related to the discretionary domain such as visiting other people and undertaking social and leisure activities.

Keywords: older people; unmet travel needs; travel needs; mobility needs; wellbeing.

1   Introduction

1.1   Ageing, travel needs and wellbeing

The ageing of the Baby boomer generation, along with the decline in birth rates and the increase in life expectancy, will lead, in the next two decades, to considerable demographic change in Western Countries (Lanzieri, 2011; OECD, 2001). European trends show that over the period 1990 to 2010 the percentage of older people grew in all the EU countries, with the average percentage increasing from around 13% to 16%, but by 2040 this is projected to almost double, reaching more than 25% (Lanzieri, 2011).

A consequence of this demographic shift towards an ageing population is the effect that it is likely to have on the transport system. It is well-known that being mobile and using transport are considered fundamental factors to increase individuals' independence during later life and contribute to personal wellbeing while ageing (Farquhar, 1995; Gabriel and Bowling, 2004; Nordbakke and Schwanen, 2014). However, the heterogeneity characterising the older population in terms of socio-demographic background, health and mobility patterns presents a challenge to fulfil their out-of-home travel needs. Research on gerontological mobility shows that travel patterns related to outdoor activities tend to decrease with advancing age, due to deterioration in health and consequent reduced access to transportation (Haustein et al., 2013; Hjorthol, 2013; Siren and Hakamies-Blomqvist, 2004). At the same time, the future generation of older people will be wealthier and healthier, with different and higher mobility expectations in terms of car access and usage and active and diverse lifestyles, especially for discretionary activities (Coughlin, 2009; Siren and Haustein, 2015). Therefore, taking into account these differences and potential inequalities, understanding which are the factors influencing travel needs and their fulfilment during later life should have a high importance for policy makers and service providers.

Transportation research traditionally relies heavily on realised mobility to investigate travel patterns. Although this approach might be sufficient when investigating the overall population, it might not be as appropriate when looking specifically at the older population. Retirement and advancing age affect individuals' lifestyle and travel behaviour, especially in terms of reduction of travel patterns (Coughlin, 2009; Haustein et al., 2013). In this sense, a reduction in travel might automatically suggest unfulfilled mobility (Hough et al., 2008) but at the same time, might result from lack of transport options and circumstance (Kim et al., 2014). Luiu et al. (2017) reviewed the existing research investigating unmet travel needs (UTN) and described these as those "mobility needs that remain unfulfilled due to the inability to accomplish needed or desired journeys and activities". The review showed that overall one-third of older people mentioned the need or desire to undertake more activities, especially those related to leisure activities, such as visiting other people. People reporting more UTN were found to be those belonging to the oldest older (75 years old and above) and female groups. Looking more specifically at the factors leading to UTN, the review was not conclusive in determining which variables have specific impact on needs' fulfilment, most likely because of the heterogeneity of the samples investigated and the differences in research approaches and foci. Nevertheless, poor health conditions and subjective wellbeing, in addition to lack of access to the car, particularly driving a car, were found to be the factors leading to the most unfulfilled mobility. The former causes a reduction in the range of outdoor activities undertaken (Scheiner, 2006), it generates issues with transport mode usage, especially boarding/alighting the vehicle or reaching public transport stops (Buys et al., 2012; Davey, 2007; Hjorthol, 2013). Furthermore, it was recognised as the main predictor for stopping driving (Haustein and Siren, 2014; Hjorthol, 2013; Siren and Haustein, 2014). The latter was found to lead to UTN in several dimensions. It reduces individual's wellbeing and personal independence, with consequent dependency on other people. Switching to being a

passenger was reported to be the preferred option once the opportunity to drive had ceased, but at the same time it was found to generate feelings of strain due to the burden placed on others (Davey, 2007; Musselwhite, 2017; Nordbakke and Schwanen, 2015). Moreover, car access was found to be necessary to undertake outdoor activities to specific destinations or during specific times, such as off-peak hours, weekends and holidays, in which the alternatives to the car were not perceived to be safe or were simply an available travel option (Davey, 2007; Musselwhite and Haddad, 2010; Nordbakke, 2013). In this regard, discretionary activities were those most affected, since the car often represents the easiest way to meet these travel needs, hence reduced car access leads to a reduction of leisure and social activities, spontaneous trips and the ability to be present at special occasions (Davey, 2007; Haustein and Siren, 2014; Hjorthol, 2013; Musselwhite, 2017; Musselwhite and Haddad, 2010; Siren and Haustein, 2014), particularly in rural and suburban environments (Buys et al., 2012; Glasgow and Blakely, 2000; Zeitler and Buys, 2015). Nevertheless, Scheiner (2006) and Kasper and Scheiner (2002) challenged this view and found the role of the car to be statistically insignificant to predict travel needs fulfilment when other variables were controlled for (e.g. health and possession of public transport season ticket). Finally, the review showed that socio-demographic background and built environment variables were characterised by conflicting findings, especially in relation to the effects of home location and household characteristics.

1.2   Aim of the study and conceptual framework for analysis

Using these findings as a starting point, this paper aims to understand the factors influencing travel needs amongst the British older population, with regard to both realised and unfulfilled mobility. The work builds on an existing conceptual framework (Luiu et al., 2018a) to assess

travel needs fulfilment of older people. The framework is structured around the assumption that fulfilment of out-of-home travel needs during later life is determined by more than just the transport environment and availability of options. Hence, the framework is defined by five main identified domains and associated sub-topics shaping mobility amongst the older population, namely:

I. *Transportation*: travel patterns and access to transport modes, attitudes towards transportation, barriers affecting transportation, coping strategies for those not driving and travel planning activities;

II. *Health and wellbeing*: subjective satisfaction with health, mobility and place of living, amount and type of impairments, impairment affecting transportation;

III. *Built environment*: living context, accessibility to both public transport and facilities, services and goods;

IV. *Demographics*: living form, socio-economics characteristics, individual characteristics

V. *Activities*: type of activities and their importance.

2   Data and methods

2.1   Sample and study area description

This study focused on older people aged 60 years and above living in the urban area of Birmingham, a large metropolitan borough located in the West Midlands region of the United Kingdom (UK). It is the UK's second city after London in terms of population, with 189,978 people aged 60 years old and above (17% of the total population) (Birmingham City Council, 2015). Data for this study were collected through a survey questionnaire distributed to 2000 older people recruited between 1st March 2016 and 31st March 2017.

Participants were recruited from potential organisations, charities and public locations usually

frequented by older people. More specifically, three main sources were identified for the recruitment process. First, the Birmingham 1000 Elders Group, which is a group of volunteers involved in research activities relevant to older people within the University of Birmingham. Then, three centres from Age UK, a registered charity operating in the UK to support people aged 50 years and above and is considered one of the biggest charities in the UK related to later life. Finally, a group of people approached and recruited in locations such as Birmingham city centre, malls, supermarkets, public transport stops/stations and the University of Birmingham main campus. Potential participants housed in care homes, nursing homes or sheltered housing were not considered for recruitment as many of their out-of-home mobility needs are fulfilled as part of their housing contract.

In total 288 questionnaires were returned, a 14% response rate. Respondents comprised of 155 women (54%) and 133 men (46%). The total median age was 74 years, with the female group having a median age of 73.6 years and the male group 74.4 years. A detailed description of the respondents' background characteristics is provided in Section 4.1.

2.2 Measures

Demographic characteristics draw on the standards used by previous studies of this type and are analysed in order to outline a background profile of the participants, namely individual characteristics, socio-economic factors, living form and environment (Haustein and Siren, 2015). Individual characteristics are age, gender and ethnic background. Socio-economic factors are identified as income, education and employment status. Living form and built environment characteristics include marital status, place of living, number of people living in the household, presence of dependent people in the household and years lived in the local community.

Health and wellbeing variables include both objective and subjective information. With

regard to health issues, participants were first asked to specify whether or not they suffered any health problem, disability or general physical frailty that might have affected their ability to use any kind of transport mode. Then, a list of 20 diseases and illnesses was presented to specify which type of health issues they had suffered in the five years before the survey. The list is derived from previous studies in transport field investigating older people's mobility (Haustein and Siren, 2014; Siren and Hakamies-Blomqvist, 2004; Siren and Haustein, 2014). Moreover, participants were asked to rate the extent to which health issues made it difficult to use each of the seven transport modes identified in this study *(not difficult at all; not very difficult; difficult; very difficult; impossible)*. Individual wellbeing was measured by asking participants to rate their subjective satisfaction *(not very satisfied; not satisfied; neither satisfied or not satisfied; satisfied and very satisfied)* with regard to three aspects: out-of-home mobility, health and place of living.

Transportation variables were measured according to three main criteria: importance of transport in everyday life; mode usage and planning activities. Importance of transport was assessed by asking participants to rate the role of transportation overall and of specific modes (Car / van; Bus; Train; Walking; Cycling; Taxi and Flexible Transport Service[1]) in their everyday life on a five-point rating scale *(Not very important; not important; neither important or not important; important and very important)*. With regard to transport mode usage, participants were asked to provide information about the number of cars available in their household, whether or not they hold a driving licence and, in case of a negative answer, the reason why they stopped driving *(never had a licence, licence not renewed and voluntary stopped driving)*. Transport usage was measured in terms of frequency of use of the above mentioned seven modes *(never or hardly ever; about once or twice a month; once a week; twice a week and more than twice a week)*. Moreover, participants were asked how often they

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[1]Flexible Transport Service (FTS) comprises of transport modes including community transport, demand responsive transport; dial-a-ride services; shared taxis/taxi buses; car sharing and carpooling.

were able to get a lift if they had stopped driving *(rarely; not often; sometimes; often and always)*. In addition to these, participants were asked to report up to three barriers preventing the use of alternative modes to the car. Finally, the last of the three criteria concerns the planning activity related to the journey experience. Participants were asked whether or not they planned their journeys and the average amount of time spent planning *(less than one hour; less than ten hours; one day; more than two days and more than a week)*.

Built environment was measured in terms of place of living (city centre, inner and outer suburbs) and accessibility with regard to public transport provision and facilities, services and goods availability. Participants were asked to specify whether or not both public transport services and facility services or shops were available in the area where they live and to rate how far it was to reach them.

Activity patterns were measured in terms of both realised and unrealised mobility. With regard to the former, participants were asked to specify the average frequency of the following activities: 1) Grocery shopping; 2) Other shopping; 3) Bank / post office; 4) Medical appointment; 5) Visiting other people; 6) Eating outside home; 7) Social and leisure; 8) Going for a walk; 9) Other. Furthermore, participants were asked which travel mode they mainly used to carry these out. In terms of unrealised mobility, participants were asked whether or not there are times they cannot make trips they want. Where this was the case, they were asked to specify the missed activities and the main reasons preventing them undertaking these activities.

2.3   Data analysis

Data collected from the questionnaire survey have been analysed using the software IBM SPSS Statistics 24. The analysis comprised of two different typologies. Firstly, data were analysed using descriptive statistics including frequency and cross tabulation. Secondly,

logistic regression analyses were employed to test the impact and the interrelationships of the investigated variables regarding both realised and unfulfilled mobility of the older population. The dependent variables used for the analyses consisted of the frequency of the activities for realised mobility and if respondents reported UTN for unfulfilled mobility. The independent variables were selected on the basis of the conceptual framework outlined in Section 1.2. Furthermore, in order to gain a deeper insight and see differences in significance when other variables were introduced, the independent variables were investigated according to multiple models, namely:

- Model 1: Transportation resources and abilities variables;

- Model 2: Model 1 and demographic variables;

- Model 3: Model 2 and health and wellbeing variables;

- Model 4: Model 3 and built environment variables

- Model 5: Model 4 and activity frequency (only for unfulfilled mobility analyses).

3   Results

3.1   Demographics

Table 1 shows around 40% of the respondents live alone, due to being single or widowed. Amongst those not living alone, 12.9% had a dependent person in their household. Almost all participants were retired (86.9%), with only 2.3% and 6.9% still working full-time and part-time, respectively. Almost two-thirds of participants have an income between £15,000 and £24,999. With regard to the education levels, almost three-quarters (74.8%) completed an education above secondary school. The vast majority were ethnically white and from the UK, while more than two-thirds lived in the inner suburbs and on average had lived in the same area for around 28 years on average, with more than two-thirds of respondents living in the same area for more than 20 years.

Table 1. Socio-demographic characteristics of the survey participants

Characteristics	%		%		%
Gender		*Marital status*		*Dependent person in household*	
Male	46.0	Single	18.5	Yes	12.9
Female	54.0	Living with a partner	4.2	No	87.1
		Married	50.6		
Age groups		Living with other family member	3.9	*Employment status*	
60-64	4.2	Widowed	15.1	Retired	86.9
65-69	22.3	Separated or divorced	7.7	Full-time employed	2.3
70-74	40.1			Part-time employed	6.9
75-79	13.2	*Education*		Unemployed	0.4
80-84	10.1	Primary education	1.2	Other	3.5
85+	10.1	Secondary education	21.6		
		Higher education	74.8	*Place of living*	
Household size		Other	2.4	City centre	15.9
1	39.1			Inner suburbs	70.0
2	54.5	*Ethnic background*		Outer suburb	14.1
3 or more	6.4	White British	86.7		
		White other background	6.6	*Years living in same area*	
Income		Black or Black British - Caribbean	0.4	Less than 10 years	16.8
Less than £9,999	5.7	Asian or Asian British - Indian	1.6	10-19 years	10.7
£10,000 to £14,999	15.1	Mixed - White and Black Caribbean	1.6	20-29 years	26.4
£15,000 to £24,999	65.1	Mixed – White and Black African	0.4	30-39 years	22.5
£25,000 to £44,999	11.3	Other mixed background	0.4	40-49 years	16.3
More than £45,000	2.8	Information refused	2.3	More than 50 years	7.3

3.2 Health and wellbeing

The vast majority of the respondents assessed their personal wellbeing as satisfactory with regards of the three variables investigated. Indeed, 90% of them reported to being satisfied or very satisfied about their place of living and 85% about their out-of-home mobility. The percentage decrease in terms of subjective health conditions, while still remaining significant (73.5%). Looking more specifically at the health conditions of the respondents, more than 40% of them reported to have experienced health problems, disabilities or general frailty that might have affected their ability to use any kind of transport modes in the five years preceding the survey. Of those, almost half of the impairments were mobility issues,

particularly pain in joints (18%), reduced mobility in legs or feet (14.5%) and arthritis (14.2%).

With regard to how these impairments affected transport mode usage, the majority of the respondents reported no difficulties due to health impairments. The only modes significantly affected in this sense were found to be walking and cycling. Indeed, around one-third of the respondents reported difficulties in walking (31.6%) and cycling (34.1%). Significantly, 21.5% of those experiencing difficulties in cycling stated it would be impossible to use this transport mode. Problems with walking and cycling might be connected with the high percentage of people experiencing mobility problems, as previously mentioned.

3.3   Transportation

The car has great importance in everyday mobility of the respondents. Indeed, 83% of them stated car is important for their transport. More than three-quarters have access to a car in their household and 86% hold a driving license. Of those not having a license, data show that having not renewed the licence, having voluntarily stopped driving and never having held a licence were found to have similar percentages, with around one-third of the respondents reporting each. Older women more frequently reported never having a driving licence, as well as the decision of voluntarily stopping driving. Older males more frequently reported not renewing their license. Moreover, one-third of those not driving reported not being able to get a lift easily whenever they want or need, with 26% of them mentioning they could get one only sometimes. Again, the female group was the most affected.

Looking at the barriers affecting alternative transport modes to the car, respondents reported the main issues preventing the usage of public transport are associated with poor service provision due to unsuitable routes and timetable (55.5%) and infrequent and unreliable services (38.8%). Health impairments also affect public transport usage due to difficulties in

boarding and alighting the vehicles (15.7%). With regard to both taxis and FTS, more than half of respondents highlighted that the main barrier was the lack of need to use these modes, especially as driving a car, having someone taking care of their mobility needs or public transport are better options for travel. Furthermore, taxis use was affected by the high cost (31%), while FTS by the lack of knowledge and awareness about how it works and where the service is provided (15.1%). Planning a journey was found to be a common practice amongst the respondents, with most taking less than 1 hour to organise their travels. For those who didn't or rarely planned, this was mainly because of the lack of need, especially due to relying on personal knowledge and experience in traveling.

3.4   Built environment

Looking at accessibility and availability of public transport and facilities, services and goods, results show that all participants reported to be served by public transport services in their place of living, though only 85.5% with regard to facilities, services and goods. In terms of ease of access, both public transport stops/stations and facilities, services and goods were found to be, for around two-thirds of respondents, close to their home (68% and 76%, respectively). Only 10% reported public transport stops a long way away, while 6.5% considered it difficult to reach facilities, services and goods from their dwelling.

3.5   Activity patterns and activities that people want to do more often

Observing the activity frequency (**Error! Reference source not found.**), respondents reported shopping, having a walk, leisure and social activities as the three main reasons for travelling. Shopping journeys are those accounting for more trips, with more than two-third of respondents reporting to undertake this activity at least twice a week. With regard to social, leisure and sport activities, 63.2% of participants said they undertook these activities at least twice a week and 20.1% once a week. Similarly, 54.3% reported walking at least

twice a week and 20.1% once a week. Reporting these activities as the main purpose for travelling is in line with the findings from several studies investigating the mobility of the older population (Hjorthol, 2013; Siren and Haustein, 2014). Looking at the main transport mode used to undertake activities, driving a car was found to be the most used way to undertake most activities, stressing again the importance of this mode in later life. Walking was the overall second most used mode, particularly for undertaking other shopping, bank/post office and medical appointments. However, public transport modes, particularly the bus, was more used than walking to carry out shopping and discretionary activities such as visiting other people, eating outside, leisure and social activities (Table 2).
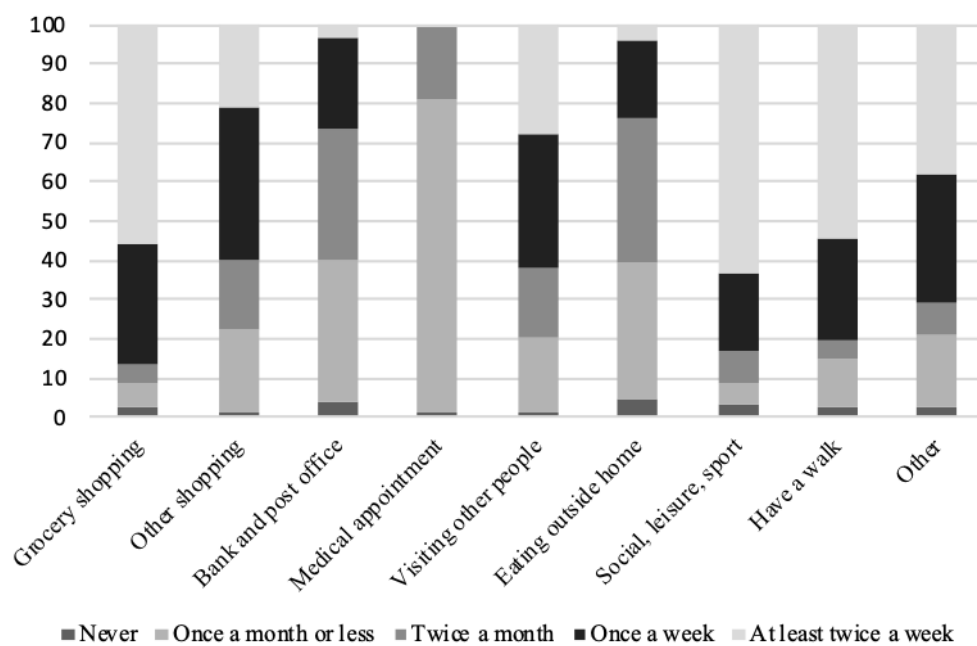
Figure 1. Trip frequency per single activity

Table 2. Travel purpose by main transport mode

	Activities								
	Grocery shopping	**Other shopping**	**Bank**	**Medical visit**	**Visiting others**	**Eating outside**	**Leisure Social**	**Have a walk**	**Other**
Transport modes									
Car (Driver)	44.4%	20.7%	25.4%	24.3%	37.3%	37.2%	29.3%	13.8%	32.9%
Car (Passenger)	8.5%	5.8%	6.6%	6.3%	18.0%	27.0%	14.1%	0.7%	7.1%
Bus	22.0%	24.0%	18.4%	11.1%	14.2%	10.0%	12.0%	6.0%	18.8%
Train	2.8%	16.2%	5.9%	0.0%	7.1%	7.1%	14.1%	4.9%	9.4%
Walking	15.2%	25.9%	39.3%	48.0%	12.3%	9.7%	11.0%	74.6%	21.2%
Cycling	6.2%	6.5%	3.3%	6.9%	5.7%	4.5%	9.2%	0.0%	7.1%
Taxi	0.0%	0.0%	0.0%	2.4%	2.0%	2.9%	4.7%	0.0%	3.5%
FTS	0.9%	1.0%	1.1%	1.0%	3.4%	1.6%	5.6%	0.0%	0.0%

Almost one-third of respondents said they had UTN. As Table 3 illustrates, visiting other people was the most reported activity older people wanted to undertake more often, with more than half of participants having UTN. Around 40% of respondents reported the desire to undertake shopping and leisure/social activities or going out for a walk. Significantly, for all the unfulfilled activities, the female group reported more UTN, particularly for visiting other people and leisure/social activities. These findings are in line with previous studies on UTN, as highlighted by a previous review (Luiu et al., 2017). For those activities with highest UTN, almost half of respondents reported health issues as the main cause, while around one-third mentioned lack of transport service availability, lack of time and not knowing how to get to a specific place (Table 4).

Table 3. Activities participants would like to undertake more

	Female	Male	Total
Have a walk	20%	18%	38%
Grocery shopping	11%	9%	20%
Other shopping	13%	9%	22%
Bank / post office	2%	0%	2%
Medical appointment	5%	2%	7%
Visit other people	34%	23%	57%
Eat outside home	13%	7%	20%
Leisure and social	23%	16%	39%
Other	5%	4%	9%

Table 4. Reasons for not undertaking more activities

	Female	Male	Total
Health problem	24%	22%	46%
Not enough time	13%	10%	23%
Cost of the travel	2%	3%	5%
Transport service not available	18%	11%	29%
Too far away	8%	6%	14%
Do not know how to get there	14%	11%	25%
No lift available	14%	5%	19%
Need to look after someone	0%	10%	10%
No company	8%	6%	14%
Difficulty board/leave the vehicle	10%	6%	16%

3.6   Understanding the impact of investigated variables on realised and unfulfilled mobility

In order to understand the propensity of respondents to fulfil their travel needs and the impact of the variables identified in Section 2.2 on both realised mobility and UTN, a set of logistic regression analyses were carried out. Given the relatively small sample (n=288) and the implications of this for logistic regression analysis (Scheiner, 2006), both dependent and independent variables for the analyses were recoded as solely dichotomous variables. Realised mobility was investigated in terms of whether respondents were active or not in undertaking their activities. With regard to UTN, the dependent variable has been formulated based on the question: "*Are there times when you cannot make trips you want?*", with

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participants having a yes/no option to respond. In addition to this, a set of analyses has been employed to investigate the impact on the three most reported unfulfilled needs: shopping (sum of grocery shopping and other shopping), leisure activities (sum of leisure/social, eating outside home and having a walk) and visiting other people. Even though visiting other people might be considered a leisure activity, it was decided to analyse it separately given it was the most reported unfulfilled activity. Overall, access to the car and health conditions were found to be the two main factors influencing fulfilment of travel needs amongst the investigated sample, although with some differences.

Table 5 shows that holding a driving license and having easy access to lifts for those that do not drive were found to be the only significant variables affecting activity frequency in terms of access and usage of transport modes. Moreover, having one or more impairments affecting the use of transport mode was found to reduce activity frequency, but this was not the case for subjective satisfaction with mobility, health conditions and place of living. Demographic variables did not appear to affect activity frequency in Models 2 and 3. However, with the introduction of built environment variables in Model 4, both living alone and reduced amount of years living in the same area were found to be significant and affect activity frequency.

In terms of UTN, Tables 6 illustrates that fewer factors influence fulfilment of needs compared to the realised mobility. Access to the car and health conditions were found to be statistically significant, despite some differences with realised mobility. Indeed, only holding a driving license was found to decrease UTN in terms of transportation variables, while for health and wellbeing variables it was a case of being satisfied with both out-of-home mobility and health conditions. Demographic variables did not appear to affect UTN, nor did being active in terms of undertaking out-of-home activities. Finally, having facilities, services and goods distant from place of living is a predictor of unfulfilled needs for leisure activities.

Table 5. Logistic regression analysis of activity frequency

	Model 1				Model 2				Model 3				Model 4			
	B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.	
Holding a driving licence	0,903	0,174	0,01	0,46	1,250	0,098	0,12	0,75	2,349	0,022	0,10	1,29	2,780	0,016	0,02	1,84
Easy to get a lift	2,483	0,046	0,10	0,37	3,226	0,042	0,13	0,56	5,313	0,020	1,22	1,81	6,102	0,013	1,35	2,56
Frequent PT user	-0,306	0,744	0,67	0,90	-0,071	0,947	0,79	1,53	0,104	0,934	1,40	1,78	-1,034	0,523	1,68	1,97
Frequent walking user	0,780	0,255	0,57	0,83	0,789	0,337	0,44	1,10	0,210	0,840	0,16	1,47	-0,466	0,709	0,05	1,72
Frequent cycling user	2,848	0,909	0,01	0,49	2,676	0,936	0,01	0,65	2,615	0,947	0,02	0,71	2,258	0,963	0,30	0,84
Frequent taxi user	-1,522	0,258	0,02	0,30	-1,082	0,521	0,01	0,92	-1,901	0,373	0,02	0,98	-3,325	0,470	0,01	0,99
Frequent FTS user	-2,430	0,137	0,01	0,21	-2,426	0,214	0,02	0,40	-1,454	0,499	0,03	0,57	-0,503	0,837	0,01	0,72
Gender					-0,367	0,653	0,14	0,34	-0,733	0,488	0,06	0,13	-1,415	0,238	0,02	0,25
Age (<75 years old)					-0,635	0,490	0,09	0,32	-1,201	0,342	0,03	0,13	-2,308	0,141	0,01	0,26
Dependant person in household					-0,240	0,779	0,15	0,42	0,182	0,870	0,14	0,16	-0,084	0,946	0,08	0,10
Being single or widowed					-1,067	0,332	0,04	0,29	-1,747	0,207	0,01	0,12	-3,695	0,046	0,01	0,09
Years living in current area					1,019	0,261	0,47	0,64	2,534	0,051	0,09	0,16	4,050	0,018	0,20	0,41
Having higher education					0,197	0,390	0,78	0,91	0,498	0,097	0,09	0,12	0,467	0,219	0,76	0,33
Satisfactory out-of-home mobility									-1,339	0,464	0,01	0,19	-5,044	0,099	0,01	0,26
Satisfactory health conditions									0,692	0,694	0,06	0,16	2,133	0,315	0,13	1,53
Having health impairment									2,981	0,010	0,26	0,36	3,019	0,021	0,58	1,26
Living in city centre													1,783	0,348	0,14	0,24
PT stop far													-3,013	0,212	0,01	0,56
Facilities distant from home													-2,208	0,093	0,01	0,14

p <.05

Table 6. Logistic regression analysis of unmet travel needs

	Model 1				Model 2				Model 3				Model 4				Model 5			
	B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.	
Holding a driving licence	-1,783	0,032	0,03	0,86	-2,175	0,036	0,02	0,87	-3,229	0,035	0,01	0,80	-3,856	0,039	0,01	0,82	-5,626	0,017	0,01	0,37
Easy to get a lift	-0,074	0,911	0,26	0,35	-0,054	0,945	0,20	0,43	-0,699	0,521	0,06	0,42	-1,285	0,335	0,02	0,37	-4,223	0,058	0,01	0,15
Frequent PT user	0,104	0,864	0,34	0,66	0,157	0,826	0,29	0,47	0,001	0,999	0,18	0,36	0,805	0,475	0,25	0,56	1,323	0,370	0,21	0,67
Frequent walking user	-0,899	0,143	0,12	0,36	-0,483	0,517	0,14	0,26	0,096	0,931	0,13	0,96	-0,999	0,480	0,02	0,58	-1,734	0,316	0,01	0,52
Frequent cycling user	1,757	0,336	0,16	0,20	1,995	0,339	0,12	0,43	2,116	0,437	0,04	0,17	2,830	0,578	0,01	0,35	-0,273	0,972	0,01	0,26
Frequent taxi user	1,212	0,357	0,26	0,44	0,055	0,972	0,05	0,23	-0,270	0,893	0,02	0,13	0,193	0,934	0,01	0,11	1,540	0,698	0,01	0,11
Frequent FTS user	-0,748	0,675	0,01	0,15	-1,001	0,644	0,01	0,25	-1,375	0,648	0,01	0,09	-1,697	0,755	0,01	0,07	0,195	0,980	0,01	0,57
Gender					0,389	0,615	0,32	0,67	1,267	0,232	0,44	1,28	1,239	0,335	0,28	1,42	1,100	0,509	0,12	0,78
Age (<75 years old)					1,242	0,174	0,58	1,20	-0,969	0,547	0,02	0,88	-1,519	0,342	0,01	0,50	-1,983	0,265	0,01	0,44
Dependant person in household					1,557	0,123	0,65	1,34	0,843	0,514	0,19	0,59	1,214	0,406	0,19	0,58	3,082	0,129	0,41	1,11
Being single or widowed					0,363	0,682	0,25	1,16	0,830	0,437	0,28	1,18	1,284	0,376	0,21	1,17	2,374	0,185	0,32	1,35
Years living in current area					-0,040	0,083	0,92	1,01	-0,039	0,290	0,90	1,03	-0,026	0,509	0,90	1,05	-0,014	0,773	0,90	1,09
Having higher education					0,708	0,418	0,37	1,11	1,797	0,274	0,24	0,94	1,632	0,368	0,15	0,17	2,149	0,266	0,20	0,35
Satisfactory out-of-home mobility									-6,525	0,017	0,01	0,32	-7,422	0,034	0,01	0,57	-12,790	0,023	0,01	0,17
Satisfactory place of living									-0,055	0,973	0,04	0,23	2,415	0,285	0,13	0,93	7,214	0,077	0,46	1,40
Satisfactory health conditions									1,822	0,378	0,11	0,35	2,625	0,309	0,09	0,21	7,333	0,085	0,37	0,63
Having health impairment									-1,017	0,270	0,06	0,22	-0,372	0,710	0,10	0,49	-1,164	0,352	0,03	0,36
Living in city centre													2,272	0,118	0,56	1,67	2,620	0,131	0,46	1,41
PT stop far													1,091	0,735	0,01	0,16	2,221	0,456	0,03	0,31
Facilities distant from home													2,917	0,037	0,19	0,28	6,527	0,027	0,21	0,38
Active respondent																	4,870	0,058	0,85	1,19

p <.05

Looking more specifically at factors affecting the fulfilment of leisure activities (Table 7), visiting other people (Table 8) and shopping activities (Table 9), the analysis reveals two main findings. Firstly, activities to pursue leisure are influenced by more factors compared to the other two and they are affected along different domains. Similar to the findings for the overall UTN, factors significantly decreasing the chance to experience unfulfilled leisure activities were holding a driving licence, being satisfied with out-of-home mobility and health conditions, in addition to limited distance of place of living from facilities, services and goods. Both shopping activities and visiting other people present similar findings, with holding a driving licence and subjective satisfaction with out-of-home mobility and health being the only variables leading to UTN.

Table 7. Logistic regression analysis of unmet travel needs – Leisure activities

	Model 1				Model 2				Model 3				Model 4				Model 5			
	B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.	
Holding a driving licence	-1,288	0,111	0,06	1,35	-1,759	0,088	0,02	1,30	-2,864	0,050	0,01	1,00	-3,709	0,059	0,0	1,15	-4,940	0,035	0,01	0,70
Easy to get a lift	0,127	0,847	0,31	0,41	0,087	0,911	0,24	0,56	-0,631	0,553	0,07	0,42	-1,201	0,354	0,02	0,38	-3,772	0,078	0,01	0,15
Frequent PT user	0,310	0,613	0,41	0,41	0,452	0,521	0,40	0,62	0,332	0,702	0,25	0,76	1,315	0,266	0,37	0,97	1,993	0,190	0,37	1,14
Frequent walking user	-1,116	0,072	0,10	0,33	-0,752	0,315	0,11	0,39	-0,078	0,942	0,11	0,77	-1,242	0,390	0,02	0,48	-1,993	0,256	0,01	0,42
Frequent cycling user	1,728	0,341	0,16	0,19	1,788	0,392	0,10	0,27	2,045	0,444	0,04	0,14	3,049	0,604	0,01	0,21	0,319	0,969	0,01	0,17
Frequent taxi user	1,166	0,376	0,24	0,42	-0,243	0,878	0,04	0,17	-0,591	0,779	0,01	0,14	0,335	0,891	0,01	0,16	1,338	0,739	0,01	0,10
Frequent FTS user	-0,493	0,780	0,02	0,19	-0,888	0,680	0,01	0,28	-1,565	0,593	0,01	0,16	-2,199	0,722	0,01	0,19	-0,340	0,968	0,01	0,12
Gender					0,355	0,646	0,31	0,64	1,067	0,299	0,39	0,76	1,170	0,353	0,27	0,38	0,802	0,610	0,10	0,48
Age (<75 years old)					1,261	0,171	0,38	0,48	-0,751	0,626	0,02	0,46	-1,408	0,370	0,01	0,53	-1,796	0,294	0,01	0,47
Dependant person in household					0,012	0,989	0,18	0,56	0,287	0,780	0,18	0,96	0,760	0,590	0,14	0,33	1,758	0,304	0,20	0,56
Being single or widowed					1,479	0,137	0,63	0,76	0,798	0,531	0,18	0,27	1,266	0,384	0,20	0,61	3,088	0,130	0,40	0,83
Years living in current area					0,697	0,426	0,36	0,71	1,396	0,346	0,22	0,73	1,004	0,549	0,10	0,52	1,547	0,391	0,14	0,69
Having higher education					-0,321	0,153	0,47	1,13	-0,413	0,230	0,34	1,30	-0,326	0,375	0,35	1,48	-0,230	0,603	0,33	1,89
Satisfactory out-of-home mobility									-5,607	0,021	0,01	0,42	-6,125	0,029	0,01	0,16	-10,609	0,047	0,01	0,13
Satisfactory place of living									1,174	0,529	0,11	0,69	1,762	0,503	0,42	0,96	5,654	0,187	0,12	0,84
Satisfactory health conditions									0,998	0,546	0,08	0,12	3,986	0,108	0,03	0,10	8,080	0,044	0,06	0,12
Having health impairment									-1,110	0,233	0,05	0,20	-0,533	0,599	0,08	0,42	-1,155	0,340	0,03	0,33
Living in city centre													2,670	0,059	0,91	1,23	3,159	0,061	0,87	1,06
PT stop far													1,707	0,574	0,01	0,21	2,672	0,353	0,05	0,40
Facilities distant from home													3,259	0,031	0,13	0,50	6,455	0,028	0,20	0,59
Active respondent																	4,221	0,084	0,57	0,81

p <.05

Table 8. Logistic regression analysis of unmet travel needs – Visiting other people

	Model 1				Model 2				Model 3				Model 4				Model 5			
	B	p	95% C.I.		B	p	95% C.I.		B	p	95% C.I.		B	p	95% C.I.		B	p	95% C.I.	
Holding a driving licence	-1,149	0,077	0,09	0,11	-0,990	0,207	0,08	0,17	-2,031	0,038	0,02	0,89	-1,952	0,045	0,02	0,96	-2,107	0,036	0,02	0,87
Easy to get a lift	-0,328	0,614	0,20	0,25	-0,018	0,981	0,22	0,42	0,360	0,696	0,24	0,87	0,504	0,598	0,25	0,89	0,921	0,391	0,31	1,02
Frequent PT user	0,027	0,962	0,34	0,39	0,221	0,711	0,39	0,49	0,394	0,597	0,35	0,63	0,503	0,508	0,37	0,73	0,569	0,460	0,39	0,79
Frequent walking user	-0,611	0,325	0,16	0,18	-0,371	0,611	0,17	0,28	-0,760	0,451	0,07	0,33	-0,940	0,385	0,05	0,32	-1,032	0,355	0,04	0,31
Frequent cycling user	0,058	0,971	0,05	0,25	-1,368	0,515	0,01	0,15	0,123	0,945	0,03	0,28	0,358	0,840	0,04	0,36	1,011	0,591	0,07	0,29
Frequent taxi user	0,446	0,721	0,14	0,18	0,127	0,929	0,07	0,14	-0,645	0,717	0,02	0,17	-0,734	0,734	0,01	0,33	-1,258	0,569	0,01	0,21
Frequent FTS user	1,417	0,312	0,26	0,64	2,769	0,157	0,34	0,74	3,559	0,104	0,48	0,79	3,437	0,122	0,40	0,76	3,419	0,134	0,35	0,54
Gender					0,612	0,386	0,46	0,73	0,770	0,397	0,36	0,58	0,838	0,361	0,38	0,81	0,804	0,375	0,38	0,79
Age (<75 years old)					0,230	0,773	0,26	0,60	-2,071	0,158	0,01	0,22	-2,094	0,166	0,01	0,23	-2,332	0,160	0,01	0,25
Dependant person in household					0,909	0,275	0,49	0,68	0,858	0,351	0,39	0,62	0,916	0,339	0,38	0,45	0,766	0,447	0,30	0,15
Being single or widowed					0,402	0,612	0,32	0,70	0,324	0,753	0,39	0,78	0,329	0,746	0,19	0,81	0,144	0,888	0,16	0,85
Years living in current area					-0,414	0,245	0,19	0,43	-0,525	0,122	0,18	0,36	-0,298	0,423	0,18	0,38	-0,106	0,807	0,16	0,27
Having higher education					1,892	0,101	0,69	0,72	0,685	0,566	0,81	0,93	0,556	0,648	0,79	0,96	0,232	0,852	0,59	0,77
Satisfactory out-of-home mobility									-4,556	0,005	0,01	0,35	-4,328	0,015	0,01	0,42	-4,582	0,016	0,01	0,43
Satisfactory place of living									-0,283	0,833	0,28	0,53	0,150	0,991	0,47	0,77	0,074	0,959	0,62	1,12
Satisfactory health conditions									4,873	0,025	0,19	0,43	5,072	0,026	0,16	0,19	5,689	0,023	0,11	0,14
Having health impairment									-0,827	0,277	0,10	0,19	-0,668	0,396	0,11	0,23	-0,383	0,656	0,13	0,36
Living in city centre													2,509	0,078	0,41	0,69	2361	0,122	0,32	0,64
PT stop far													0,041	0,983	0,03	0,42	-0,286	0,887	0,02	0,38
Facilities distant from home													0,756	0,341	0,45	0,86	0,675	0,416	0,39	0,80
Active respondent																	-1,124	0,271	0,04	0,24

p <.05

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Table 9. Logistic regression analysis of unmet travel needs - Shopping activities

	Model 1				Model 2				Model 3				Model 4				Model 5			
	B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.		B	*p*	95% C.I.	
Holding a driving licence	-1,978	0,014	0,03	0,67	-0,969	0,323	0,03	0,84	-2,354	0,051	0,02	0,80	-2,606	0,074	0,02	0,83	-3,318	0,039	0,02	0,78
Easy to get a lift	-0,399	0,634	0,09	0,42	-0,554	0,571	0,15	0,52	-0,853	0,466	0,18	0,71	-1,761	0,272	0,20	0,81	-3,438	0,119	0,22	0,72
Frequent PT user	1,148	0,110	0,22	0,40	1,069	0,156	0,21	0,58	1,709	0,119	0,18	0,59	1,802	0,148	0,21	0,83	1,957	0,189	0,20	0,82
Frequent walking user	-1,056	0,171	0,06	0,21	-0,607	0,487	0,11	0,46	-0,547	0,653	0,08	0,33	-0,510	0,742	0,04	0,16	0,491	0,809	0,03	0,14
Frequent cycling user	1,109	0,486	0,01	0,18	0,584	0,744	0,01	0,24	1,569	0,375	0,01	0,27	0,843	0,675	0,01	0,18	-0,653	0,792	0,01	0,11
Frequent taxi user	1,347	0,241	0,27	0,46	0,800	0,585	0,06	0,41	0,004	0,999	0,04	0,44	-0,475	0,859	0,04	0,27	0,993	0,751	0,01	0,19
Frequent FTS user	0,322	0,832	0,07	0,28	-0,579	0,760	0,01	0,13	-1,385	0,545	0,01	0,28	-2,737	0,405	0,01	0,41	-2,616	0,501	0,01	0,37
Gender					0,528	0,508	0,07	0,49	0,822	0,457	0,07	0,57	1,309	0,294	0,06	0,55	1,859	0,273	0,07	0,54
Age (<75 years old)					1,210	0,146	0,30	0,56	-0,091	0,946	0,11	0,21	-0,274	0,861	0,09	0,17	-0,089	0,957	0,09	0,21
Dependant person in household					0,165	0,874	0,97	1,13	-0,313	0,786	0,98	1,10	-0,406	0,760	1,00	1,19	1,392	0,405	0,76	0,93
Being single or widowed					-0,233	0,801	0,22	0,34	0,030	0,980	0,21	0,31	-0,633	0,632	0,24	0,38	-0,682	0,671	0,23	0,34
Years living in current area					-0,332	0,232	0,48	0,61	0,487	0,195	0,55	0,73	-0,631	0,195	0,39	0,58	-0,631	0,195	0,39	0,58
Having higher education					0,441	0,650	0,01	0,33	0,949	0,462	0,01	0,29	1,048	0,505	0,01	0,41	1,160	0,525	0,01	0,44
Satisfactory out-of-home mobility									-4,452	0,003	0,02	0,37	-5,018	0,037	0,02	0,36	-5,913	0,040	0,02	0,34
Satisfactory place of living									3,113	0,252	0,28	0,44	3,113	0,252	0,28	0,44	3,113	0,252	0,28	0,44
Satisfactory health conditions									1,367	0,021	0,07	0,20	1,540	0,032	0,06	0,29	2,763	0,048	0,04	0,21
Having health impairment									-0,233	0,781	0,08	0,34	0,514	0,610	0,10	0,52	-1,055	0,407	0,11	0,75
Living in city centre													-2,364	0,359	0,44	0,63	-3,677	0,285	0,58	0,77
PT stop far													0,674	0,783	0,03	0,33	3,399	0,230	0,01	0,34
Facilities distant from home													1,833	0,075	0,62	0,84	1,506	0,190	0,61	0,80
Active respondent																	4,659	0,066	0,03	0,44

p <.05

4 Discussion and conclusions

This paper aimed to investigate which factors affecting out-of-home mobility amongst the older population, both in terms of realised mobility and UTN. The results from the analyses indicate that both access to the car and health conditions are the two main factors playing a significant role during later life with regard to out-of-home mobility. Holding a driving licence was the only variable to be found statistically significant ($p < .05$) in all the logistic regression analyses performed. Furthermore, difficulties in getting a lift easily was found to affect activity frequency, highlighting the importance of accessing a car when it becomes not possible to drive anymore. Several studies show how often switching from driving to being a passenger is the preferred option for older people in order to carry out their activities (Davey, 2007; Kim, 2011b). In our study the majority of non-drivers had access to the car in their household, but at least one-third mentioned not being able to get a lift whenever they wanted. Hence, it may be postulated that having access to the car in the household does not imply at the same time an ability to use it and that it is important to understand access to the car more in terms of how easy it is to get a lift whenever required. Another significant aspect of the importance of the car amongst older people was related to the factors preventing the use of alternative transport modes, particularly taxis and FTS. While these two options might provide similar characteristics to the car in terms of performance indicators such as flexibility, door-to-door access and availability, the main reported barrier was the lack of need to use them, due to the fact that respondents either had a car or someone would take care of them in case of need. Data from the National Travel Survey (NTS) (Department for Transport, 2016) show that in the UK the car is the most used mode amongst older people in terms of both distance travelled and trip frequency. In this sense, almost two-thirds of the journeys are undertaken with this transport mode, both as a driver or a passenger and data show increasing trends in the last twenty years in this sense, with regard to all age groups of

older people and gender (Department for Transport, 2016).

Health-related variables were also shown to affect both realised and unfulfilled mobility, although in different ways. Indeed, while having one or more impairments affecting the use of transport was found to reduce activity frequency, poor subjective perception of both health conditions and out-of-home mobility were found to increase the chance of UTN, particularly for leisure activities. Furthermore, health was reported by almost half of the respondents as the main reason amongst the subjective indicators for those not being able to carry out their activities when they wanted to do. Around one-third of the respondents stated that health issues affected particularly walking and cycling journeys, due most likely to the fact the most frequent impairments were those associated with mobility, namely: pain in joints, reduced mobility in legs or feet and arthritis. This can be the reason why, amongst the factors preventing public transport usage, boarding and alighting operations were amongst the most mentioned, as found in several other studies (Broome et al., 2010; Broome et al., 2013; Kim et al., 2014; Wretstrand et al., 2009). Finally, it is acknowledged that the car can compensate for health issues in order to carry out daily activities (Siren and Hakamies-Blomqvist, 2004), however health impairments are at the same time amongst the main predictors for driving cessation (Haustein and Siren, 2014; Haustein et al., 2013; Hjorthol, 2013). This might explain why those who have voluntarily stopped or not renewed their license fall amongst the older age groups, since health impairments tend to be more frequent with advancing age, as found also in Haustein and Siren (2014).

Demographic variables were not found to be significant factors leading to UTN. However, both living status and the amount of time living in the same area were found to affect activity frequency. Haustein and Siren (2014) highlighted that for older people living alone experiencing UTN can be associated with lack of company to undertake out-of-home

mobility and reduced access to the car in case of being able to drive compared to those living with family members. In this sense this study found that older people living alone were found to report less access to the car in their household and more difficulties in getting a lift compared to those living with a partner, supporting this view. At the same time living for an extended amount of time in the same area can increase individual knowledge with regard to both transport options and facilities available in the same area of living, as well as an extended social network of neighbours, as also found by Kim et al. (2014).

With regard to the built environment, the regression analyses revealed that having facilities, services and goods distant from the place of living is among the factors which increase the likelihood of reporting UTN, especially travel for leisure. However, the analysis does not show any statistical effect of the living context, contrary to the findings of Kim (2011a) and Siren and Hakamies-Blomqvist (2004). A possible explanation in this sense might be the fact that despite these studies showing that living in inner cities might reduce UTN, it is more a matter of how services, goods, activities and transport are easily accessed rather than where they are located.

An additional significant finding was the extent of UTN found amongst the respondents. Almost one-third reported the desire or need to undertake more activities than they currently do, particularly women. Discretionary activities were found to be the most unfulfilled. These findings are in line with Luiu et al. (2017)'s review, stressing the importance that unfulfilled mobility has during later life and how this topic should not be underrated in transport research, especially for discretionary activities. Scheiner (2010) showed these types of activities are liable to be more individualised than the utilitarian ones, and therefore the effect of driving a car might be explained in this sense compared to the other transport modes and asking for a lift from other people (Haustein and Siren, 2014).

The analysis of transport mode usage associated with undertaken activities highlighted again the central role that the car plays in later life. Walking was found in general to be the second most used mode, particularly for carrying out shopping other than for groceries, bank/post office trips and medical appointments. A possible explanation for this might be associated with the relatively short distance travelled by the respondents, highlighting that walking can be a more valid and feasible transport option to accomplish everyday activities compared to the car or public transport, as found in other studies (Buys et al., 2012; Luiu et al., 2018b; Mindell et al., 2011). Nonetheless, the bus was used more than walking to undertake grocery shopping and discretionary activities, probably due to the involvement of longer distances and heavy loads to carry. Hjorthol (2013) found that shopping activities can be also be perceived as a social experience amongst older people. Public transport, as well as FTS (Musselwhite, 2017), can facilitate this experience given the social aspect involved in the journey (WS Atkins, 2001), particularly in those local/small locations where people tend to know each other and have higher chances to meet known people on board (Glasgow and Blakely, 2000; Shergold et al., 2012).

The results presented here are based on a smaller sample compared to other similar studies investigating travel needs during later life. A direct consequence is the design of the analyses and the reduction of the potential number of variables able to be tested in the logistic regression analyses. In this sense, considering the impact of health and wellbeing variables such as differentiation of categories of impairment (e.g. sensory, mobility or physical) and the effect of these for each transport mode usage might have provided a wider picture of the impact that health has on out-of-home mobility needs satisfaction. Similarly, adding to the analysis of subjective indicators for not undertaking more activities might have helped to better explain UTN, as shown by Nordbakke and Schwanen (2015). Other factors to take into account when analysing both descriptive and regression analyses are differences in

percentages with regard to age and gender composition of the sample. The descriptive analysis showed that older women are those suffering more health impairment, having less access to the car and reporting more UTN, although differences in gender were not found statistically significant in the regression analysis. Similarly, more than one-third of the sample belong to the age-group 70-74 years old, consequently weakening understanding of the age effect and limiting the association of advancing age with health impairment, transport usage and activity patterns. Finally, the investigation regarding transport usage relied mainly on understanding frequency and barriers affecting mode usage. However, no investigation has been undertaken to assess willingness to use alternative modes in their everyday life or in case of life changing events (e.g. driving cessation) as done in other studies (Kim, 2011b; Rahman et al., 2016; Wasfi et al., 2012). This might have added additional information about individuals' perception and knowledge of alternative modes, particularly to the car given the findings of the study. Similarly, no specific preferences about public transport usage or if participants self-selected to live in places of high public transport access was asked in the survey.

Nonetheless, this paper contributes to the existing literature in several ways. It provides a wider picture of travel needs satisfaction amongst the older population in the UK by adding value to the work done so far by other scholars (Knight et al., 2007; Musselwhite, 2017; Musselwhite and Haddad, 2010; WS Atkins, 2001). It employs a conceptual framework to assess both realised and unfulfilled travel needs of the older population, by the means of not only transport variables, but also on the basis of other domains that shape and influence out-of-home mobility during later life. Particularly, it deepens the investigation of the UTN, by helping to understand not only how the investigated variables affect it generally, but also for specific types of unfulfilled activities. Finally, it confirms that not driving a car and having poor health and wellbeing conditions are the main predictors of unfulfilled mobility and that

discretionary activities are the most reported in this sense, in line with the findings of Luiu et al. (2017).

Looking at the case study context, the NTS data show that trends in car dependence in later life are less accentuated than other places, such as the U.S.A. or Australia, but are still significant. The car is the most used mode for undertaking activities and also the preferred option for those who do not drive and driving license trends are forecast to increase notably, especially due to the contribution of the new generation of older women who currently drive. Nonetheless, there will still be the need to provide a transport system supporting mobility for those who cannot access and use the car to fulfil their travel needs. Older drivers planning their driving cessation in advance were found to report less problems in dealing with everyday mobility once they stopped driving due to the knowledge acquired and mastered in using alternative transport resources during the process (Musselwhite, 2010, 2011). At the same time, it is crucial to reduce the gap with the car in terms of the performance of other modes, particularly for flexibility, availability, and the ability to fulfil discretionary needs. The integration within the public transport network system of both FTS and taxis might allow a more customised service provision able to meet the travel needs of the older population, and at the same time reduce the impact of the identified perceived barriers for these modes. Finally, despite the significance of the car, this study showed that other domains influence the fulfilment of travel needs, particularly health and wellbeing, and that therefore a more comprehensive involvement of other sectors has to be employed to plan mobility for the older population.

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