



Older people and outdoor environments: Pedestrian anxieties and barriers in the use of familiar and unfamiliar spaces [☆]



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ABSTRACT

A limited number of studies look at older people's use of space outside the 'home' environment, particularly unfamiliar, public urban space. Such unfamiliarity can be created through older people travelling as tourists to new areas; as a consequence of urban regeneration; or as a result of cognitive decline, where the familiar becomes unfamiliar. This paper explores the experiences of older people as pedestrians in unfamiliar urban spaces. It looks at two aspects: older people's spatial anxieties and the barriers (physical, psychological, spatial and social) they perceive and encounter in unfamiliar surroundings. Forty-four participants who took part in a reality cave exercise and a sub group of 10 people who visited an unfamiliar area as pedestrians describe their experience of walking a predetermined route. Given increasing urbanisation and population ageing this is an area of importance to geographers and gerontologists.

Our study showed that there are a number of barriers that are a concern for older people in new environments; these include poor signage, confusing spaces, poor paving and 'sensory overload' i.e. noise and complexity of the environment. Landmarks and distinctive buildings were more important to participants than signage in navigating unfamiliar areas. Such experiences can contribute to practice implications for planners in designing neighbourhoods to support older people. Small changes such as placing distance on clearly marked signage; giving further information about particular areas beyond the key tourist points and using landmarks as clear navigational aids are important. This paper also adds to the growing literature on geographical gerontology.

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1. Introduction

To date a limited number of studies look at older people's use of space outside the 'home' environment, particularly unfamiliar, public space in urban centres. Such unfamiliarity can be created through older people travelling as tourists to new areas; as a consequence of urban regeneration; or as a result of cognitive decline, where the familiar becomes unfamiliar. In this paper we address two research questions: What are the experiences of older people as pedestrians in urban environments, in relation to their use, orientation and perception of familiar and unfamiliar town settings,

and secondly what barriers and anxieties within unfamiliar spaces (defined as new spaces to the older person or spaces which have become unfamiliar) do they experience. This has significance for both the concept and policy of 'ageing in place' (Lawton, 1990) i.e. the physical location of the person being constant in the transaction between person and the environment, which has been a continuing basis for the social policy of ageing (Communities and Local Government, 2007). Increasing urbanisation and redevelopment of town and city centres, the growing population of older people living in urban areas and the projected rise in older people with dementia provided the rationale for the study of unfamiliar spaces.

The paper describes the mixed methods used in the study followed by a discussion of the findings from both quantitative and qualitative data. The paper argues that although older people may feel confident within familiar environments there are different types of barrier (for example physical, economic, cultural and social) that are a concern for older people, particularly when they experience new environments. The research goes some way towards understanding the triggers that may be involved in

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leading people to feel more or less comfortable with experiencing unfamiliar spaces as they grow older. Anticipation of feelings of discomfort may lead to a retreat into familiar spaces.

2. Environment and ageing

An understanding of how older people perceive and react to the spatiality of the built environment is an area of interest to environmental gerontologists as well as geographers of ageing or geographical gerontologists. Environmental issues within gerontology have traditionally concentrated on developing conceptual models to look at the dynamic between the competencies of the individual and the demands of the environment drawing on the psychological perceptions of the environment (Lawton et al., 1980; Wahl and Weisman, 2003). Although this development has been almost independent of the wider geographical literature of space, place and ageing the focus on the social, cultural, spatial and physical context has increasingly received attention (Holland et al., 2007; Andrews and Phillips, 2005). The social and experiential dimensions of place and ageing has drawn on the work of human geographers such as Rowles (1978, 1986), Rowles and Watkins (2003), Warnes (1982, 1990), Harper and Laws (1995), Andrews and Phillips (2005) and Andrews et al. (2007). Traditionally however the spatial study of ageing and later life has focused on the locational domains of the body, 'home', and residential care ignoring the complexity and diversity of how older people experience space and place in the built environment as they age (Del Casino, 2009). The literatures of both gerontology and geography have coalesced around issues such as 'ageing in place' (Rowles, 1978), place attachment (Rubinstein and Parmelee, 1992), spatiality and age identity (Laws, 1997; Peace et al., 2006, 2011), care provision (Milligan and Wiles, 2010; Wiles, 2003; Phillips and Bernard, 2008); wellbeing, independence and mobility (Schwanen and Ziegler, 2011), rural services (Dwyer and Hardill, 2011), Mobility, migration and distance (Joseph and Hallman, 1998) and urbanisation (Phillipson et al., 2001; Scharf et al., 2003), all of which addresses more explicitly space and place. Yet there is considerable scope for further integration of gerontology and geography to understand the dynamics of the environment and ageing. Andrews et al. (2007) argue that geographical gerontology lacks a clear identity and profile with fractured debates between disciplines and call for a more nuanced approach to researching space and place and ageing.

An area of human geography – around pedestrianism – has entered the realm of those studying ageing and the built environment. The few studies that explore older people and pedestrianism are evident in public health geography literatures arguing that neighbourhood design influences physical activity, health and consequently independence. Functional impairments as well as inactivity levels can be exacerbated by environmental context in which older people live with more walkable neighbourhoods associated with promoting walking and healthier ageing (King et al., 2011; Wang and Lee, 2010). Our knowledge about the relationship between the physical environment and physical activity in older adults is however limited and inconsistent, relying often on standardised measures without an understanding of the behaviours, perceptions and meanings of space and place that link the outdoor environment and health (van Cauwenberg et al., 2011; Day, 2008) or go beyond the micro-environment of home (Vine et al., 2012). To some extent this has been addressed in a limited number of qualitative or mixed method studies combining a psychological and sociological perspective, looking at different environmental dimensions for example cleanliness, social interaction and peacefulness and their impact on health (Day, 2008); mobility and falls in the outdoor environment (IDGO); mobility and well being (Ziegler and Schwanen, 2011) and the impact of problems with traffic and pedes-

trian infrastructure on walkability (Vine et al., 2012). A further strand on the cultures and methods of pedestrianism can be found in the work of Lorimer (2011) and Middleton (2009). The latter argues that time and space are resources in people's everyday walking practices allowing for time to think and organise their household routines which helps shape their identity.

The study on which the paper is based took a distinctively multi-disciplinary view drawing on geography and social gerontology, spatial planning as well as psychology. Combining geographical and gerontological perspectives and using mixed methods we explore aspects of pedestrianism and the unfamiliar environment. Introducing the concept of unfamiliarity adds to both geographical and gerontological literatures. Discussions of age and place (such as place attachment, ageing in place) rely on a familiarity of place developed over a period of time. Schwanen et al. (2012) and Golant (2003) highlight the need for strengthening the theoretical development around domains such as spatio-temporality and we respond to this through the introduction of the concept of 'unfamiliarity'.

As people go through the life course their comfort and use of space changes (Rowles, 1978) due to: first, changes in their personal circumstances and physical/mental well-being, for example, changes in cognitive functioning some older people will experience unfamiliarity in their previously recognisable household surroundings (Setterstein, 1999). Second, as urban landscapes change through regeneration or decline, the use of space changes and previously familiar places may become unfamiliar. Unfamiliarity with one's location also occurs when the built environment is new; an experience encountered by increasing numbers of older people as they travel the world as tourists or relocate due to necessity or choice in later life. Unfamiliarity can lead to insecurity, disorientation, fear over personal safety, social exclusion and loss of independence. To maintain their self-respect and dignity, it is important to minimise the number of instances in which older individuals become 'lost' (Lynch, 1960; Ohta, 1983). Fear of disorientation deters older people from using public buildings (Foster et al., 1998), and appearance of uncertainty as they travel can earn the label 'confused' (Remnet, 1981). Enabling navigation and orientation in unfamiliar built environments is therefore essential to 'ageing in place' and the development of 'place attachment'.

Use of space and mobility may be restricted through disability, dependency and care needs or expanded through travel and leisure interests, migration and relocation (Regnier, 1976; Lawton et al., 1980). Social factors such as population density, crime rate and ethnic mix may also influence people's use and perception of space and their radius of activity (Phillipson et al., 2001; Scharf et al., 2003). The meaning and use of space will vary between older people depending on their biography and past experiences, and the extent to which they encounter new spaces alone or in the company of friends and family (Diehl and Willis, 2004; Rubinstein and de Medeiros, 2004). They may also adjust their use of space because of changes that occur in the environment – for example, changes in the physical features and users of public spaces. While most people will be aware of changes in the form and nature of the spaces they experience over time, there is little understanding of how reproduction of this background space affects older people in particular ways.

Although there are many studies on accessibility, there is less research on the impact and effects of architecture and town design on older people's usability, including their perception of the unfamiliar built environment. The research to date has concentrated on older people's use of familiar places, often their own 'home' (Rowles et al., 2004). Only recently has the research focus centred on a wider neighbourhood or city scale (Biggs and Tinker, 2007; Sugiyama and Ward Thompson, 2007) and looked at issues of spatiality in later life rather than exclusively on how the individual adapts to their environment. Considerable work has been undertaken in

relation to mobility and later life (Mollenkopf et al., 2005; Oswald, 2005; Rantakokko et al., 2010) some of which has addressed the barriers of the outdoor environment mainly from a psychological perspective drawing on an ecological theory of Person – Environment fit (Lawton and Nahemow, 1973).

We know that ‘ageing in place’ and familiarity with environment can hide deterioration in cognitive and physical functioning; it can also lead to increased engagement and confidence (Findlay and McLaughlin, 2005; Kirasic, 2000). In contrast we know little about older people’s response to public spaces and the changes that may occur there (Holland et al., 2007; Chaudhury and Rowles, 2005). Imposing buildings, poor street layout and expanses of empty space can intimidate people with dementia for example (Mitchell and Burton, 2006). There is less understanding of the triggers that may be involved in leading people to feel uncomfortable with experiencing unfamiliar spaces as they grow older, which in turn may lead to a retreat into familiar spaces (Blackman et al., 2007), and the factors producing differential responses to these triggers. Consequently a mixed method study was developed to explore these gaps in the literature around the outdoor environment and unfamiliarity.

3. Research methods

A sample of 44 volunteers was recruited from organizations for older adults (University of the 3rd Age, 50+ forum) in Swansea to explore issues of how older people perceive and use unfamiliar space. A mixed methods approach was adopted to explore older people’s experiences of unfamiliar environments from different perspectives. Quantitative and qualitative data were collected through interviews conducted with participants; prior to participation in a ‘reality cave’ where 2D images in familiar and unfamiliar towns were displayed including a 30 min filmed walking route through an unfamiliar town centre; this was followed by a ‘field’ visit by 10 self-selected participants in the research to an unfamiliar town centre, where they followed the town route in real time and met with local older residents in a focus group. This method was chosen to triangulate data on older people’s responses to unfamiliar environments.

Prior to the cave exercise participants were asked to complete a questionnaire detailing demographic information and cognitive functioning (Cognitive Abilities Screening Instrument – CASI). All participants were ambulatory with no pre-existing diagnosis of cognitive impairment (average scores for male and female participants using CASI were 96.3 and 97.0, respectively). 60% (26) of the sample was female with 40% (18) male. The group was drawn from primarily middle-class organizations, which required a high level of participation and this was reflected in that most were well educated. The majority was native to South Wales and had lived in the area for considerable lengths of time (Table 1).

Table 1 details some of the questions asked in the quantitative survey. The sample group was independent, active and participative in community life, relatively healthy, well educated and (self reported) confident. Participants perceived their local familiar neighbourhood as convenient for local facilities, easy to navigate and generally pleasant with many attractive natural sights and buildings in the neighbourhood. Although our participants’ residential neighbourhoods were not in the town centre, their comments do indicate they perceived their local environment as good and navigable.

Given the difficulty in taking all 44 older people to the unfamiliar area we explored the use of a reality cave. This method had the advantage as it allowed us to project a number of different unfamiliar and familiar moving images which would not have been possible if all participants had travelled to one unfamiliar area (author’s own, 2011). In the virtual reality cave participants were

shown images of familiar (their hometown centre) and an unfamiliar town centre and asked to comment on both still images and a 30 min walk around the unfamiliar town. Seated next to the researcher they were asked to remark on specific items during the journey – for example the use of signage, confusing and helpful cues, colour, lighting, their confidence and the general impression of the route. Familiar environments were used to standardise participants’ knowledge of familiar places and spaces. Older people were asked to give a detailed narrative in relation to their reactions to and perceptions of unfamiliar spaces, as they journeyed through a route chosen through reconnaissance fieldwork by the research team and planners. We asked the participants for their comments and impressions of the predetermined route. The narratives were recorded, transcribed and analysed using the themes in the Urban Design Quality (UDQ) framework as detailed below. The UDQ (Ewing et al., 2005, 2006) is a well-used tool capturing appropriate information relevant to the study and provided an analytical framework as well as enabled comparison between studies.

A group of participants (10) were later taken to the location of the unfamiliar area (in the East of England) to undertake a further ‘walk around town’ with researchers and older people from the town itself, enabling comparisons to be made between the cave environment and ‘reality’. Although the town centre in theory was now a familiar image following the reality cave experience it could be argued that an element of unfamiliarity remained due to the time lapse (9 months) between cave and reality and the different sensory experiences that were not available in the cave, such as smell and noise rendered the town centre as an unfamiliar experience. All 10 participants were ambulatory and in good self reported health. Here they followed the route projected in the cave and made assessments of their urban milieu. Additional qualitative data were collected through participants recording their experiences in notes and through discussions with a group of local residents (10) and planners. Consequently the notes and focus group discussions were recorded and thematically analysed in the same way as the cave narratives using the UDQ framework themes and organised using Nvivo software. The qualitative data was analysed using content analysis and assessed alongside the answers to the quantitative questionnaire (analysed using SPSS).

We analysed and themed material from the cave narratives (from the 44) and the fieldwork (10 participants) using the Urban Design Quality index which captures information about the quality of urban spaces including such items as the range of building uses, the presence of amenity areas and planting. Together these provided a quasi-objective assessment of the condition, ambience and aesthetics of the urban environment along the route screened in the reality cave. The UDQ measure in its core form consists of five sections covering a sense of enclosed space (enclosure and transparency), items which match the sizes and dimensions of people (human scale), memorability of a locality (imageability) and the visual richness of places (complexity). Enclosure and transparency include variables such as presence of walls, long sight lines and observable sky. By human scale the developers of UDQ refer to physical environment aspects such as the presence of potted plants, flower beds, and street furniture. Imageability refers to aspects, which can produce a lasting positive impression such as historic or distinctive buildings and landmarks. The last section of UDQ, complexity, covers items relating to diversity in both the built and social environments of landscapes. The notes and commentaries were transcribed, analysed drawing out the key themes from the narratives and then coded, compared and triangulated by two researchers.

This paper synthesises quantitative data collected from the participants before the cave exercise with their qualitative narratives recorded whilst viewing the filmed walking route, during the ‘field’ visit and in the focus groups with local residents. The

Table 1
Characteristics of participants.

	Males	Females	Total
CASI	96.3	97.0	96.7
Gender	40.0 (N = 18)	60.0 (N = 26)	100.0 (N = 44)
Mean age	71.1	70.3	70.82 (N = 44)
Mean years living in Swansea	36.7	36.8	36.8
<i>Living arrangements</i>			
• Lived alone	22.2 (N = 2)	38.5 (N = 10)	31.8 (N = 14)
• Lived with other(s)	77.8 (N = 14)	61.5 (N = 16)	68.2 (N = 30)
<i>Education</i>			
• Degree	27.8 (N = 5)	34.6 (N = 9)	31.8 (N = 14)
• School or college level	38.9 (N = 7)	41.3 (N = 11)	40.9 (N = 18)
• Other (vocational, other, etc.)	33.3 (N = 6)	23.0 (N = 6)	27.3 (N = 12)
<i>Home area</i>			
• South Wales (including Wales)	50.0 (N = 9)	50.0 (N = 13)	50.0 (N = 22)
• England	44.4 (N = 8)	(N = 9)	38.6 (N = 17)
• Elsewhere	5.6 (N = 1)	15.4 (N = 4)	11.4 (N = 5)
Drive myself		Passenger	Varies
"Do you usually drive yourself or travel as a passenger?"	72.7 (N = 32)	11.4 (N = 5)	15.9 (N = 7)

	Never	Sometimes	Quite often	Always	
"I am a relatively fit and healthy person"	2.3 (N = 1)	2.3 (N = 1)	22.7 (N = 10)	72.7 (N = 32)	
"I manage the tasks of day-to-day living quite well"	0	0	6.8 (N = 3)	93.2 (N = 41)	
"I have a positive attitude towards myself"	0	2.3 (N = 1)	25.0 (N = 11)	72.7 (N = 32)	
"I am a relatively fit and healthy person"	0	0	13.6 (N = 6)	86.4 (N = 38)	
"I feel satisfied with the shopping facilities in my local area"	2.3 (N = 1)	31.8 (N = 14)	34.1 (N = 15)	31.8 (N = 14)	
"I think my residence is located in a good area"	4.5 (N = 2)	0	34.1 (N = 15)	61.4 (N = 27)	
	Never (confident)	Sometimes (confident)	Quite often (confident)	Always (confident)	
"I feel confident enough to do the things I want to do"	0	2.3 (N = 1)	25.0 (N = 11)	72.7 (N = 32)	
"I feel confident in my ability to take care of myself"	0	0	13.6 (N = 6)	86.4 (N = 38)	
	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree	
"Stores are within easy walking distance of my home"	15.9 (N = 7)	13.6 (N = 6)	27.3 (N = 12)	43.2 (N = 19)	
"There are many places to go within easy walking distance of my home"	15.9 (N = 7)	13.6 (N = 6)	27.3 (N = 12)	43.2 (N = 19)	
"It is easy to walk to a bus or train from my home"	2.3 (N = 1)	6.8 (N = 3)	6.8 (N = 3)	84.1 (N = 37)	
"My neighbourhood streets are well lit at night"	6.8 (N = 3)	9.1 (N = 4)	29.5 (N = 13)	54.5 (N = 24)	
"There are crossings and pedestrian signals to help walkers cross busy streets in my neighbourhood"	27.3 (N = 12)	15.9 (N = 7)	34.1 (N = 15)	22.7 (N = 10)	
"I find the shops in this area are conveniently located"	2.3 (N = 1)	25.0 (N = 11)	27.3 (N = 12)	45.5 (N = 20)	
"I find the local area is well set out"	2.3 (N = 1)	15.9 (N = 7)	36.4 (N = 16)	45.5 (N = 20)	
"There are many attractive natural sights in my neighbourhood"	0	6.8 (N = 3)	34.1 (N = 15)	59.1 (N = 26)	
"There are many attractive buildings/homes in my neighbourhood"	4.5 (N = 2)	18.2 (N = 8)	38.6 (N = 17)	38.6 (N = 17)	
"There are trees along the streets in my neighbourhood"	18.2 (N = 8)	15.9 (N = 7)	29.5 (N = 13)	36.4 (N = 16)	
There is so much traffic along nearby streets that it makes it difficult or unpleasant to walk in my neighbourhood"	25.0 (N = 11)	36.4 (N = 16)	29.5 (N = 13)	9.1 (N = 4)	
	Rarely or never	About once a week	A few times a week	Daily or several times a day	
"How often do you go out in your local area during good weather?"	2.3 (N = 1)	2.3 (N = 1)	27.3 (N = 12)	68.2 (N = 30)	
"How frequently do you usually walk more than a kilometre (about half a mile)?"	2.3 (N = 1)	6.8 (N = 3)	54.5 (N = 24)	36.4 (N = 16)	
"How often do you travel to a town centre that is unfamiliar to you?"	63.6 (N = 28)	34.1 (N = 15)	2.3 (N = 1)	0	
	1–5 min	6–10 min	11–20 min	20–30 min	30+ min
"How long would it take to walk to nearest convenience/small grocery store?"	6.8 (N = 3)	4.5 (N = 2)	29.5 (N = 13)	29.5 (N = 13)	29.5 (N = 13)
"How long would it take to walk to nearest post office?"	15.9 (N = 7)	9.1 (N = 4)	18.2 (N = 8)	36.4 (N = 16)	20.5 (N = 9)
	Drive myself	Lift from friend/relatives	Bus	Train	Other
"What is the main form of transport you use when travelling to a town centre that is unfamiliar to you?"	50.0 (N = 22)	13.6 (N = 6)	20.5 (N = 9)	11.4 (N = 5)	4.5 (N = 2)

data resulting from this mixed methods approach are used to analyse how older people perceived their familiar locality, alongside their experiences of unfamiliar places and barriers and anxieties they have about the environment.

4. Results

The quantitative and qualitative data have been analysed in a complimentary fashion. The former have been used to compute

standard measures with respect to the study participants so that they may be placed in the context of the findings from other research with older people. The qualitative data have been examined by means of content analysis and quotations from the oral narratives during the reality cave experience and field visit have been selected to tease out relevant themes. Whilst recognising that the number of participants is towards the lower end of what might be considered acceptable for the statistical analyses described in the following section, it is similar to that of Hegerty et al.'s (2002) study and overall the results should be regarded as exploratory.

4.1. Application of standard scales

It was important to connect our work on barriers to older people's navigation in unfamiliar spaces with previous research that has devised standard measures to investigate gender differences in spatial ability (Lawton, 1994, 2001) and sense of direction (Hegarty et al., 2002). We therefore included four groups of questions in the pre-cave questionnaire to quantify these differences that correspond to the Spatial Anxiety Scale (SAS), the Way-finding Strategy Scale (WFS) and the Santa Barbara Sense of Direction (SBSOD) measure. The SAS and WFS were devised to measure gender differences in respect of spatial ability, anxiety and way-finding. The SAS instrument was developed to record the level of anxiety that participants in the study would experience in eight scenarios requiring navigational skills. Although originally developed to assess car drivers we were interested to see if it could be extended to the pedestrians in our study. Participants were asked to rate their level of anxiety on a five-point scale (from 'Not at all anxious' to 'Very anxious'). The Cronbach alpha coefficient was 0.84 indicating a high degree of correspondence between the scores for each of these situations. A factor analysis (principal components, oblique rotation and number of factors unspecified) extracted two factors with eigenvalues > 1.0 together accounting for 63.0% of the variance. As in the case of Lawton's original analyses, there was a moderately strong correlation between these components (+0.40, $p < 0.01$), nevertheless both have been retained because the second component was strongly loaded in respect of one scenario (Table 2). Component 2 could be characterised as describing anxiety associated with risky spatial decisions and an aversion towards possibly getting lost. Component 1 is associated with anxiety arising from being in unfamiliar situations.

Lawton's WFS scale divides strategies for navigation into two types referred to as route knowledge and survey knowledge. The former entails learning instructions about a route whereas the latter involves developing a mental map of the area. The WFS instrument includes one group of eight strategies relating to the survey or orientation strategy and another six for the route strategy. Participants rated themselves on each of the 14 strategies on a five-point scale (from 'Not at all typical of me' to 'Very typical of me'). The Cronbach alpha coefficients for the orientation and route

strategies were respectively 0.76 and 0.78, again indicating a reasonably high degree of correspondence between the scores. A PCA on these scores with oblique rotation and the number of factors unspecified resulted in four components being extracted with eigenvalues > 1.0. These accounted for 67.4% of the total variance and were not strongly correlated with each other. Factor loadings for the components are given in Table 3. The separation of the orientation and route strategies between the first two components compared with Lawton's original work (Lawton, 1994) was similar, except that in our analysis the route strategies loaded strongly on component 1 (in Lawton's study this was component 2) and the orientation strategies on component 2 (component 1 in Lawton). The third component has reasonably strong positive loadings on two orientation strategies and the fourth on one from each group. Each accounted for less than 10% of the total variance and may reasonably be disregarded.

The SBSOD scale is based on 15 statements relating to "spatial and navigation abilities, preferences and experiences" which are scored on a 1–7 Likert scale ranging from 'Strongly agree' to 'Strongly disagree'. Good internal reliability is again indicated by a Cronbach alpha coefficient of 0.81. Following the original method a principal components analysis was carried out (varimax orthogonal rotation), which extracted five components accounting for 16.8%, 16.7%, 15.6%, 9.9% and 9.2% of the variance (total 68.3%). Differentiation between the rotated components is less clear than in the previous analyses, nevertheless the five statements indicating a good sense of spatial awareness and map skills load strongly on component 1 and strong loadings on component 2 seem indicative of a good sense of direction and component 3 seems to be associated with spatial disorientation (see Table 4). Given the small number of participants no attempt is made to interpret the remaining components, which again accounted for less than 10% of the total variance. These analysis techniques are used because they are part of the methodology used by Lawton, Hegerty, etc. to come up with their standard scales Spatial Anxiety Scale (SAS), the Way-finding Strategy Scale (WFS) and the Santa Barbara Sense of Direction (SBSOD) measure.

4.2. Spatial ability compared with gender and need for assistance with following directions

Prior to the cave exercise participants were given directions from the building where they had completed the questionnaire on the University campus to the room housing the 'reality cave'. Their ability to follow these directions provided a way of separating them into two groups in respect of navigation and spatial awareness. A similar separation has been applied with respect to gender in the results presented in Table 5 and Fig. 1. The *t*-test results show that differences between participants needing assistance with following directions and those not, and between males and females were all non-significant, although the gender

Table 2
Component loadings for spatial anxiety scale.

	Component	
	1	2
Finding your way to an appointment in an area of a city or town with which you are not familiar	.80	.17
Finding your way out of a complex arrangement of offices that you have visited for the first time	.79	-.26
Leaving a store that you have been to for the first time and deciding which way to turn to get to a destination	.73	-.28
Finding your way around in an unfamiliar shopping area	.71	.37
Locating your car in a very large car park or parking garage	.70	-.19
Finding your way back to a familiar area after realising you have made a wrong turn and become lost while driving	.68	.25
Pointing in the direction of a place outside that someone wants to get to and has asked you for directions, when you are in a windowless room	.68	-.50
Trying a new route that you think will be a shortcut without the benefit of a map	.46	.68

Principal components analysis, oblique rotation and number of factors unspecified (N=44).

Table 3
Component loadings for way-finding strategy scale.

	Component			
	1	2	3	4
<i>Orientation strategies</i>				
I kept track of the direction (north, south, east or west) in which I was going	.26	.83	-.31	-.14
I visualised a map or layout of the area in my mind as I drove	.18	.58	.40	.50
I kept track of where I was in relationship to the sun (or moon) in the sky as I went	.31	.56	-.08	-.43
Before starting, I asked for directions telling me whether to east, west, north or south at particular streets or landmarks	.55	.51	-.15	-.09
As I drove, I made a mental note of the mileage I travelled on different roads	.40	.45	.50	-.29
I kept track of the relationship between where I was and the next place where I had to change direction	.46	.37	-.41	.21
I kept track of the relationship between where I was and the centre of town	.50	.32	-.21	.39
I referred to a published road map	.31	.10	.58	.45
<i>Route strategies</i>				
Before starting, I asked for directions telling me how many streets to pass before making each turn	.76	-.49	-.08	-.17
Before starting, I asked for directions telling me how far to go in terms of mileage	.74	-.15	.14	-.31
As I drove, I made a mental note of the number of streets I passed before making each turn	.72	-.34	-.10	-.14
Before starting, I asked for directions telling me whether to turn right or left at particular streets or landmarks	.65	-.52	-.04	.15
Before starting, I asked for a hand-drawn map of the area	.58	-.22	.45	-.08
I made a mental note of landmarks, such as buildings or natural features, which I passed along the way	.46	-.26	-.39	.47

Principal components analysis, oblique rotation and number of factors unspecified ($N=44$).

Table 4
Component loadings for santa barbara sense of direction scale.

	Component				
	1	2	3	4	5
I am very good at reading maps	.84	.11	.17	.06	.11
I enjoy reading maps	.80	.04	.21	.20	.21
I am very good at judging distances	.45	.43	.10	.47	.01
I don't have a very good "mental map" of my environment	.42	.44	.37	-.10	.08
My "sense of direction" is very good	.40	.59	.25	.39	-.12
I usually let someone else do the navigational planning for long trips	.39	.19	.62	.12	.17
I tend to think of my environment in terms of cardinal directions (N, S, E, W)	.31	.77	.02	.24	.19
I very easily get lost in a new city	.11	.01	.68	.30	-.01
I don't enjoy giving directions	.10	.10	.23	.19	.64
It's not important to me to know where I am	.03	-.06	-.06	-.12	.85
I have trouble understanding directions	.01	.20	.89	-.00	.11
I am very good at giving directions	-.01	.07	.13	.86	.05
I can usually remember a new route after I have travelled it only once	-.05	.84	.07	.05	-.01
I don't remember routes well when riding as a passenger in a car	-.08	.63	.50	-.21	-.12
I have a poor memory for where I left things	-.61	-.04	.31	.23	.29

Principal components analysis, varimax orthogonal rotation and number of factors unspecified ($N=44$).

differences for using the way-finding route strategy and sense of directions had p values only marginally over the 5% significance level (0.06 and 0.07 respectively). Lawton (1994: 774) concluded that men tended to use "an orientation strategy of way-finding

... [and] ... women were more likely than men to report using a route strategy." She also claimed that "women were more likely to report anxiety about navigation than men" (Lawton, 1994: 776). When comparing with previous research, it should be noted

Table 5
Means and standard deviations of way-finding, spatial anxiety and sense of direction variables by gender and need for assistance.

		Female ($N=26$)	Male ($N=18$)	Follow directions ($N=23$)	Not follow directions ($N=21$)
Orientation strategy	x	29.46	30.67	31.17	28.62
	SD	6.70	6.174	6.69	6.04
	t	0.62		1.33	
	p	0.54		0.19	
Route strategy	x	18.62	15.78	18.26	16.57
	SD	4.92	4.882	4.70	5.38
	t	-1.89		1.11	
	p	0.07		0.27	
Spatial anxiety	x	24.64	24.22	24.64	24.29
	SD	6.17	7.272	7.128	6.12
	t	-0.20		0.17	
	p	0.84		0.86	
Santa Barbara sense of direction	x	67.08	75.22	70.39	70.43
	SD	12.48	15.035	15.16	13.02
	t	1.95		-0.01	
	p	0.06		0.99	

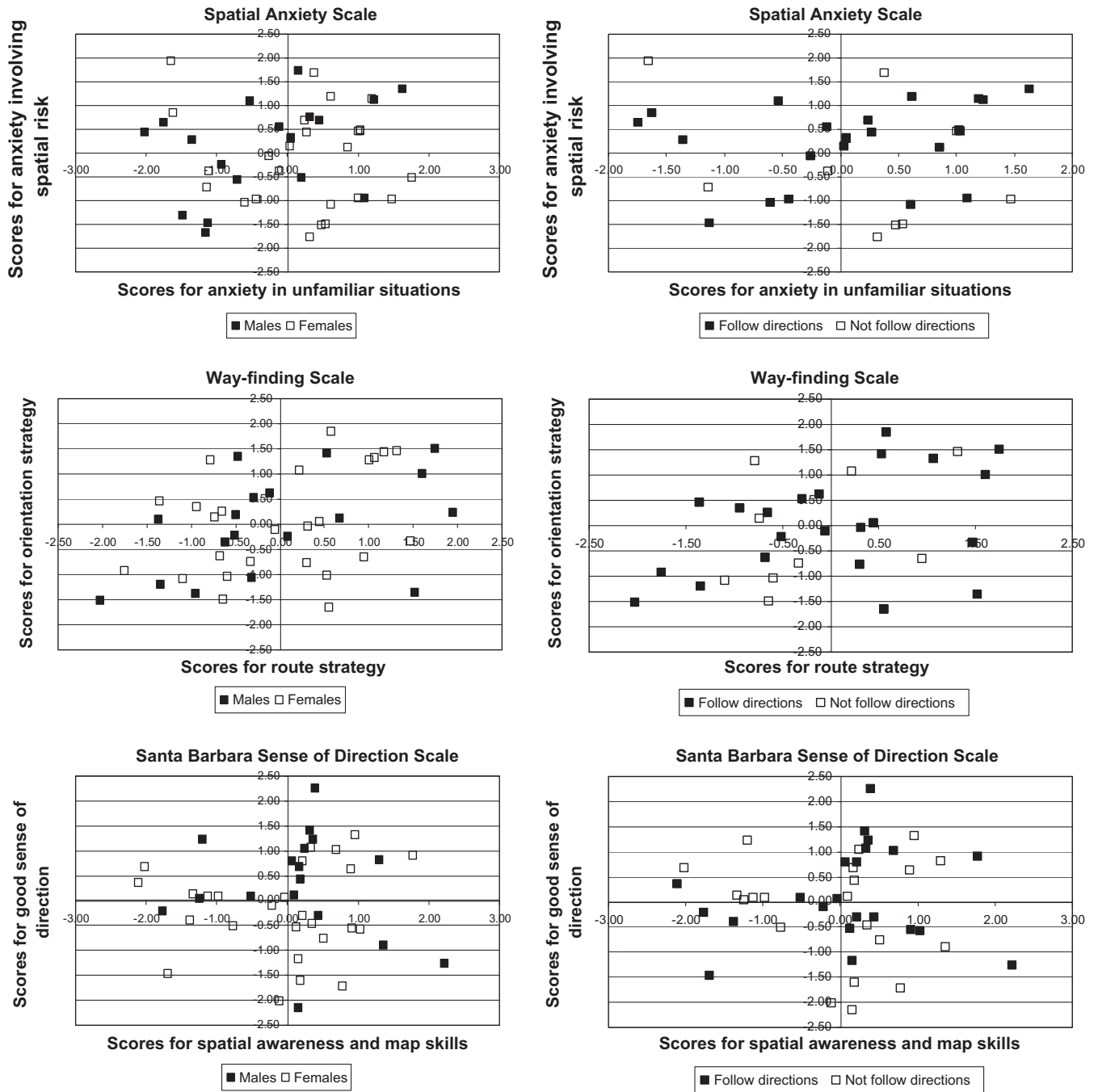


Fig. 1. Way-finding, spatial anxiety and sense of direction component scores by gender and need for assistance.

that these results have been obtained from a relatively small sample, but they do seem to support the argument that older men do not favour the route strategy for way-finding, although males and females in our sample adopted the orientation strategy.

4.3. Pedestrian anxieties and barriers in urban environments

Given the methods highlighted above the findings presented in this section focus on two aspects of the research: older people's spatial anxieties about unfamiliar environments, the perceived barriers in unfamiliar urban settings.

4.3.1. Spatial anxiety and way finding

In addition to using the Spatial Anxiety Scale we also explored this issue with the participants through questions in the survey addressing areas to avoid in unfamiliar towns and qualitatively in the cave narratives and walk around town. A number of participants however expressed confidence in their ability to find their way around

'I enjoy exploring unfamiliar places provided I have enough time to do it leisurely' (Jon, 70).

'I am happy to visit unfamiliar towns and do not fear or worry doing so. If lost or requiring information I find people are friendly and helpful. Most towns are not so big as to be able

to get lost. Most have an easy identifiable point whether it be a river, large building or road to help you find your way around.' (Sybil, 82)

Buildings and landmarks were important and helpful markers in the environment, (identified through the open-ended questions in the survey, in the cave and in the 'walk around town'). Lawton (2001: 323) found that "women tend to be more affected than men by the presence or absence of landmark cues". This gender differentiation was not evident in our survey, since the *t*-tests carried out comparing male and female responses to the WFS statements referring to landmarks were both non-significant. Male and female participants stated that they relied on landmarks to avoid getting lost in both familiar and unfamiliar towns; this however was a more prominent strategy in navigating unfamiliar than familiar places (29% versus 21% of respondents used landmarks). In unfamiliar towns this was supplemented by the use of signs (20% rather than 10% of respondents) and by using a town map (13% versus 9% of respondents). Participants were less likely to rely on remembering a route (7% versus 16%) and very few (3%) took notes to assist them avoiding losing their way. Participants who evidenced no difficulty with following directions stated in the survey that they used landmarks in the built environment and asked local people for directions. The types of landmark found most useful in both familiar and unfamiliar settings were mostly architectural, historic buildings, particularly churches and church spires. Shops provided useful cues both in terms of their colours and branding in unfamiliar areas e.g. 'You can always recognize chain shops such as M & S anywhere.' (Pam, 70).

Landmarks were important navigational aids but from the real 'walk around town' narratives people had difficulty keeping them in view, particularly if these were upward cues in the visual field, requiring constant adjustment of the focus of visual perception between looking at higher elevations to keep the landmark in sight and at street level to negotiate their immediate environment and attend to lower level cues such as broken pavements and street furniture.

'It's interesting to look up but you can't when you've got all this furniture and you have to be watching where you are walking . . . If you start by looking up at all this beautiful decoration on the town hall or looking ahead towards the water tower you could walk into something, there is too much cluttering the pavements that you can't walk straight.' (Jean, 69)

Signs are an explicit attempt by the local authority and other organisations to guide people through spaces and participants in the study generally perceived the utility of such devices. From the survey half of respondents said that street signs were helpful and a third reported that signposts were useful directional aids in unfamiliar areas. It was evident from the 'walk around town' that signposts were seen as of limited use even in unfamiliar new areas – they were often too high, positioned incorrectly in the street and without any indication of distance to the feature they were signposting. The apparent contradiction between the narrative and the survey however illustrated the importance of the minutiae of sign position, height, content and appearance (defined as human scale under the UDQ). The issue of distance between locations within an unfamiliar environment is crucially connected with people's willingness to venture 'into the unknown'. Signs may guide people towards an objective, but if information about distance is not included there remains some uncertainty over the length of walk to which people are committing themselves.

Signage is not used or valued in familiar environments; familiarity with a town centre obviated its use. Older people frequented the local centre to shop; this became routine and did not require directional signposting or navigational aids. However holidays,

sightseeing and visits to friends in unfamiliar areas were occasional and respondents relied on signs to find areas of interest and historic sites.

Preparation is important to overcome such confusion for visits to unfamiliar areas and most respondents spent time 'googling' or accessing atlases and maps, scoping guide-books and checking out places of interest. In many ways our respondents described themselves as 'tourists' or visitors when in unfamiliar areas. In the social network analysis, participants who followed directions (to the cave without difficulty) were more 'adventurous,' travelling to more unfamiliar towns using different modes of transport and travel arrangements. This group had a larger radius of movement and travelled for a variety of reasons. Given that the group were well educated and did not show signs of cognitive decline their responses may be different to those with complex needs or who do not travel due to limited resources. One respondent who had just returned from Peru commented:

'I feel that my strategy for studying a map of the area and committing it to memory works well in all circumstances.' (Stan, 80).
Linked to anxiety about the environment was the perception and worry regarding barriers in the environment.

4.3.2. Worrisome environments and barriers in the urban environment

Physical and psychological barriers were identified through a series of open-ended questions in the survey (when you are walking around unfamiliar towns, what do you think about obstacles on the pavement?) and through the narratives in the cave and 'walk around town'. From the survey ninety percent of our respondents did not think there were barriers to walking in their familiar neighbourhood. In general, similarity existed in what people experienced as troublesome or worrying in both familiar and unfamiliar areas. Irrespective of whether people could follow directions participants expressed concern with visiting town centres in the evening. During the day poorly lit areas, derelict, dirty and run down, dark streets, alleyways, underpasses and crowded areas, particularly where there were numbers of youths, led to anxiety and avoidance (defined as enclosure under the UDQ). Similarly barriers were created through anxiety of wandering into the unknown street that looked and 'felt' unsafe.

'I avoid long impersonal, dual carriageways lined by concrete buildings'
'the very dark and small passages and empty streets'
'narrow backstreets in any town'

In our open-ended questions when asked what types of situations they avoided in unfamiliar towns we found that most people referred to crowds particularly in streets with pubs and clubs:

'being alone in a quiet dark street'; 'where there are groups of young men'; 'large crowds, people shouting, protest gatherings.'
'Boisterous young people'

These quotes illustrate the importance that people perceived and attached to safety, comfort and security. The ambience and physicality of a street were immediately assessed and a number of strategies were used such as avoiding particular areas at certain times of day. This confirms other research (Holland et al., 2007) that public spaces often exclude certain population groups at particular times of the day.

As the quotes above illustrate in relation to noise, for some participants sensory overload (defined under 'complexity' in the UDQ), particularly in an unfamiliar area, was difficult. Such sensory and informational overload can provoke negative appreciation of the physical setting. From the 'walk around town' Pam (69) was surprised

'I think the first thing is the noise. When you come out of the station it was quite noisy and walk up past all the buses and all that way, it was very busy. It looked on the film a quiet town but when you actually come into that area and there are buses coming from everywhere...buses seem to have priority'.

Sensory overload goes beyond just sight, noise and colour; it extends to ambience perception and smell. These became barriers to some people, but were easier to avoid in familiar rather than unfamiliar areas. Our changing perceptions of place as we age may be linked to environmental sensory overload as places seem more complex and diverse. Participants expressed mixed views when asked about what they thought about other obstacles in both familiar and unfamiliar areas. Most commented on such barriers from a pedestrian perspective. As the quotes below indicate in busy streets shops can overflow onto the pavement deterring older people and creating a poor 'feel' to the area as well as a physical barrier.

'I noticed particularly the seats, tables, sticking out in the pavement, making it so narrow to get by- their swinging signs, so any blind person would be lucky if they hit those studs. They are more likely to walk straight into the tables or that swinging sign'. (Alice, 70)

Swinging street furniture and 'wheelie bins' were often seen as a barrier or nuisance for those who were partially sighted; participants mentioned their dislike of 'clutter' and rubbish harboured on the pavement around such obstacles (see Fig. 2).



Fig. 2. Examples of pavement obstructions: swinging advertising signs, display stands, temporary road works signs and scaffolding poles.

A further physical barrier was related to the issue of shared space, encountered and reported by the pedestrians as they walked around town. The 'taken for granted' in the familiar had to be negotiated and 'guessed at' in the unfamiliar environment. Assumed 'rules' applied in the familiar, such as the priority given to traffic over pedestrians or safe places to cross, but there is uncertainty over whether these assumptions can be transferred to an unfamiliar space. Fig. 3 shows two images off the same street with a common set of gables highlighted in each: the upper image seems to indicate that this is a pedestrianised street, although the residual double yellow lines might hint otherwise, whereas the lower one clearly shows that at certain times this road can be used by car and other vehicles. In unfamiliar areas such 'shared space' is often not segregated between car and pedestrian and for the visitor is seen as negotiated space. This can however be seen as difficult with street design being the same in two areas yet operating in different ways for example raised 'humps' in the road taken as 'informal' pedestrian crossings in one area and seen as speed humps with priorities for bus use in another unfamiliar town. 'Where you live is taken for granted' (Ivy, 81).

Barriers in the environment extended beyond just the physical. The lack of information was expressed as a barrier by three participants in the survey.

'its not easy to find tourist information offices, even though there's a sign post, very often the sign post is out of date and the tourist office has moved to a different location-I then get quite cross as I have wasted time and I am in a time limit as I have to catch a 'bus to get back home.' (Jack, 69).

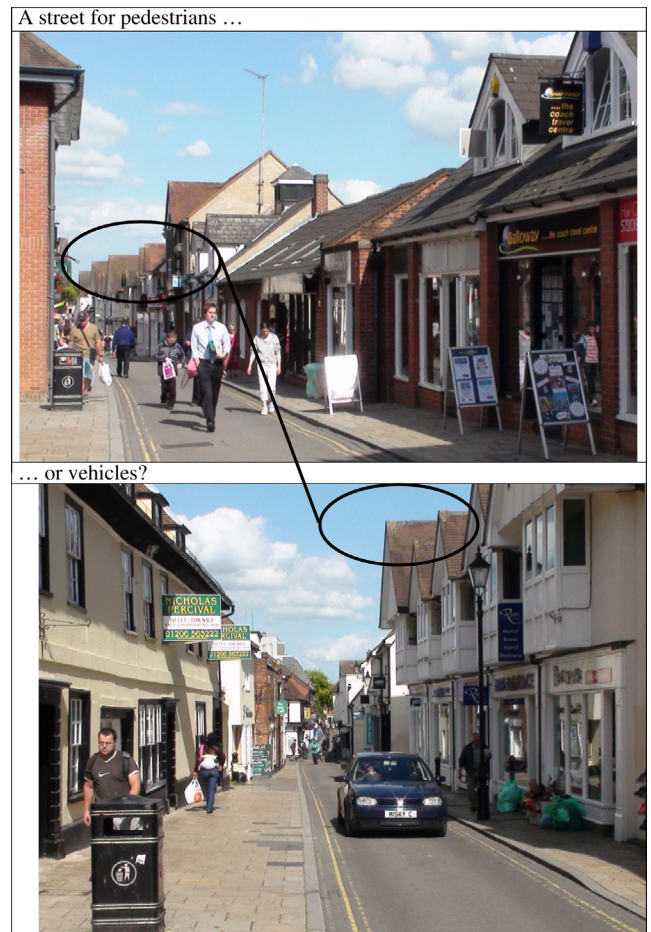


Fig. 3. Uncertainty over who has right of way – pedestrians or vehicles?.

Our study found that barriers were not only physical but also perceptual and aesthetic, due to a lack of information or consideration by shopkeepers, which deterred older people in certain parts of the town and excluded them at different times of day. Given that our participants were healthy, mobile and well educated and had previous experience of unfamiliar areas such barriers would be exaggerated for those with cognitive impairment or mobility difficulties.

5. Discussion: Ageing and the built environment

These findings suggest there are a number of implications for the way we view ageing and the built environment and that we need to broaden our perspective in environmental gerontology focusing on place and space as key frameworks for analysis which has particular relevance for spatial planners. Wahl and Weisman (2003) conclude that environmental gerontology needs to move beyond the basic domains that it addresses, namely the 'private home environment, planned environments and residential decisions.' This provides an opportunity for geographers of ageing to engage in and shape the debates on the built environment within gerontology. This empirical study attempts to marry the two sub-disciplinary perspectives – from gerontology and geography – and broadens the debate to look at more innovative and nuanced approaches to public spaces and places in the broader landscape. Through an empirical study embedded in the experience of a group of older people we operationalise the concept of 'unfamiliarity', incorporating implications for older people and planners. In taking a broader perspective we can focus on the key issues for older people in unfamiliar spaces adding to the literature on pedestrianism.

The first relates to time, both in spatio-temporal sense and in relation to the lifecourse. Assumptions in the literature are based on a degree of familiarity or habitual behaviour within the environment (Middleton, 2011a,b). Time is a key factor-over time routines become established and walking routes automated; consequently people become aware of barriers in their environment and can compensate for them or avoid them altogether. The unfamiliar environment is different; unfamiliarity by its definition doesn't allow for any habitual routine to be developed. Our study found that even time of day can have a significant influence on whether older people feel comfortable in particular spaces which may seem threatening. The literature also draws attention to the time of year and effect of weather which can exclude older people from public spaces (Wennberg, 2009). Lifecourse time is also significant as over the lifecourse familiar environments may become unfamiliar. Consequently spatial planners need to be conscious when designing and redeveloping areas of the need to retain familiar cues and landmarks.

Second, given the significance of ageing in place for policy direction it is important to review the concept in light of the study on unfamiliarity. Andrews et al. (2007) drawing on Rowles argue 'It is a complex process, not merely about attachment to a particular home but where the older person is continually reintegrating with places and renegotiating meanings and identity in the face of dynamic landscapes of social, political, cultural, and personal change' p. 157. Even our study participants who were not cognitively impaired and were well travelled stressed that it could be difficult to renegotiate meaning in an unfamiliar place given the barriers they may face in the new environment. Consequently concepts such as ageing in place should be carefully reassessed taking into account environmental barriers that may constrain 'reintegration'.

Third, the study adds to the literature on walkability and pedestrianism highlighting the need to have a more nuanced approach to different population groups. The importance of drawing on the experiences of older people rather than assuming their needs is

important to recognise; quantitative data can allow us part of the picture but it is important to enable older people to experience the environment. The complexity and diversity of both older people and their environment needs to be incorporated into analysis and design of the built environment. Middleton (2009) argues that the actual practice of walking is often obscured and lacks the experiences of people who actually walk in the city. This study addresses this using walking as a method as well as a subject of research. It also adds to Middleton's (2010) work on how time, space and place during walking are experienced sensually and routinely. The literature on pedestrianism as above draws attention to the habitual nature of walking as a coping mechanism for the pedestrian to navigate the city (Middleton, 2011a,b); this paper highlights the need for this to be extended to walks in unfamiliar spaces to enable practitioners and policy makers to understand the nuances of the environment experienced by an older visitor.

Fourth, there are a number of barriers in relation to physical safety that are a concern for older people, particularly when they experience new environments. Poor signage without an indication of distance, confusing spaces where there is no clear indication of priorities for pedestrians or traffic, noisy streets and crowded, narrow, broken pavements can all act as barriers and make the environment worrisome. People who are familiar with the area can also experience such concerns.

Fifth, landmarks are important navigational and directional prompts in the landscape. However, barriers exist in using landmarks to navigate unfamiliar places. A variety of appropriate cues are necessary to assist navigation and provide a pleasant and confident experience for older people. The study highlights the need for cues to be distinctive and include a variety of signage, appropriate postings, colours and background historical information. Landmarks such as the familiar branding of major retail outlets (e.g. M&S), although easily recognisable and potentially reassuring in an unfamiliar location, may be ambiguous because so many have been seen so often in so many towns before and could lead to over-confidence in an otherwise unfamiliar town. They may be just noticed rather than being used as part of a navigational strategy. A distinctive castle may be a better navigational cue. Safety and security issues should however be paramount – sensory overload can be experienced through too many cues and barriers. Some older people with cognitive difficulties will need different cues. Those who could not follow directions were more likely to use public transport or walk and hence assessing walkability is crucial. The immediate town environment needs to be as accommodating as possible if older people are to 'age in place' and retain independence. This not only applies to areas within the 'comfort zone' of the immediate residential neighbourhood but also busy town centres.

5.1. Implications for planners

The use of space and unfamiliarity are important issues for spatial planners considering the changing age profile of local areas because it impacts on existing residents, new residents and visitors to the area as indicated above. There is increasing recognition and consideration in the UK amongst spatial planners at national, regional and local levels of the needs of an older population (Royal Town Planning Institute – RTPI, 2004). 'Inclusive design' (designing for all groups of the population) has considered the needs of older people yet given the diversity of older people's needs it is difficult to accommodate every different interests with those of other groups in the population. Whilst previously much attention has been given to the housing needs of the older population (for example, RTPI, 2007), more recently attention has also turned to the neighbourhood level with a focus on building sustainable communities for all sectors of the population (Communities and Local

Government and International Longevity Centre UK, 2007). There are a variety of mechanisms available to spatial planners to ensure that the needs of the older population are considered, including, at a broad level, statutory duties under the Planning, Equality and Disability Discrimination Acts to consult with and provide equality of opportunity to all sectors of the population. Specific measures include policies in regional and local development documents relating to older people and the built environment, local area agreements involving local authorities and other key partners, and community plans. Whilst the *Planning Advisory Service (2009)* has identified six exemplar local authorities' planning for an ageing population, there is little research into the extent to which these mechanisms have achieved solutions tailored to the needs of older people. As *Evans (2009)* notes design guidance (and inclusive design) concentrates on the layout of buildings rather than the wider pedestrian journey in public space. This research addresses the deficit in the literature in this respect.

Unfamiliarity can be exciting and challenging as well as create unpredictability, risk and uncertainty for older people. The diversity of experience needs to be accommodated in policy and planning practice for older people as tourists as well as for older people challenged with mobility, sensory, visual or spatial issues. It is challenging for planners to accommodate the wide variety of views and needs of older people in relation to the urban environments in which they live and visit. However it is important that environments are made safe and pleasant for those who are not familiar with them. Given the projected numbers of people with dementia this is an increasingly salient point for planners; if older people are to retain their independence and well being as well as take an active role in society more emphasis needs to be placed on enabling older people to participate in good quality urban spaces. Planners and designers should look to small changes such as placing distance on clearly marked signage; giving further information about particular areas beyond the key tourist points and identifying the purpose of places; using landmarks as clear navigational aids. The concept of 'shared space' also needs to be reassessed in light of older people's repeated comments (*Blackman et al., 2007*). Older people come with a variety of experiences and knowledge of areas, which planners need to pay attention to if areas are to become attractive, safe and walkable areas. Across the discussions with planners in this study (*Hockey and Phillips, in preparation*), older people's experience of space was primarily expressed in terms of physical relationships, with housing, transport infrastructure, and the public realm. There was little that touched upon the social and economic contexts of older people's lives and the impact of these contexts upon their use of the built environment. The impact of the environment on well-being and behaviour was considered predominantly in relation to provision of appropriate forms of housing, with other aspects of well-being largely overlooked, for example, the link between attractive environments, green space, activity and health; and the positive effect of place attractiveness on social interaction, which tended to be treated as a function of transport and accessibility.

6. Conclusion

Many of these points above apply to all age groups. A focus on 'inclusive design' is a key issue. However there are particular aspects in relation to older people. Older people may have a combination of minor problems such as poor hearing, sight problems, poor mobility and balance, which can be made more acute within unsuitable urban environments. This not only addresses the needs of older people who are mobile and enjoy 'foreign' travel as our participants but also those who experience the familiar becoming unfamiliar in environments where they are 'ageing in place'

through changes in the environment through regeneration or in themselves through cognitive decline. As more people are predicted to experience cognitive decline over the next 30 years there is an imperative to look at outdoor environments and the extent to which these are accessible and usable by older people with complex needs in ways that go beyond just concentrating on the physical accessibility to buildings. Building inclusive and age supportive environments based on the above issues is important in making the unfamiliar familiar for older people and enabling them to be independent, mobile and empowered in unfamiliar environments.

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