

Taking part in activities, an exploration of the role of discretionary travel in older people's wellbeing

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Introduction: Activity theory, a construct from social gerontology, provides a framework to bridge the themes of ageing and transport, and thus enable new insights into the role of out-of-home mobility for wellbeing. The theory proposes that undertaking activities (classified as formal, informal and solitary) can generate wellbeing benefits for older people. Transport can be an important enabling mechanism for activity, but such engagement is at risk should access to a car be lost at a time of declining public transport provision in many communities in countries like the UK.

Method: Analysis of survey data collected by the '*Grey and Pleasant Land?*' study of UK rural citizens aged sixty and above (N =920), which explores activity participation for groups with and without car access. As well as descriptive analysis of the data, a series of binary logistic regression models facilitate exploration of relationships between mobility and activity, and then activity and wellbeing.

Results: Those with car access are up to three times more likely to participate in formal activity (OR 3.228; CI 1.656, 6.293). More surprisingly, there are higher levels of informal activity for those without car access (65% of this group engage in activity with friends' weekly compared to only 51% of those with car access). The wellbeing measures proved less conclusive, although lack of weekly activity with friends and family slightly increases the probability of loneliness (OR 1.472; CI .877, 2.470). Age and health are seemingly more important factors.

Conclusions: Links are seen between formal activity and mobility, but less so for informal activity. In both instances, activities are relatively local; suggesting endeavours to improve mobility and activity will achieve optimum wellbeing and community cohesion benefits at a local level. Activity theory does appear to offer promise as a way of exploring these issues.

Keywords: Aging, Activity theory, Rural, Mobility, Wellbeing

1. Introduction

At a time of continued reductions in rural transport services in the UK (AgeUK, 2013; Citizens Advice, 2017), older people in rural communities in the UK face the prospect of travel constraints (Gray, 2004) and challenges in accessing services and facilities if they do not drive (Acre, 2014). Social engagement is also seen to be contingent on car use (Curl et al., 2013). With a growing ageing population in these rural areas this shortfall could have negative consequences, both for the individuals themselves and for their communities (Shergold et al., 2012; CRC, 2012). In particular, in moving from personal mobility, characterised by the private car, to shared mobility alternatives, it is the ability to make social and leisure journeys that is perhaps given insufficient consideration by planners and policy makers. Instead, their focus (with limited resources) will be on supporting journeys to access healthcare or to shop for food for instance.

These issues are explored using data from rural communities in southwest England and south Wales. The findings are likely to have relevance for older rural dwellers in other countries with ageing rural populations, and for those living in other areas that also offer limited alternatives to the car for transport for older people (for example peri-urban and suburban districts).

The remainder of the paper is made up as follows. Context is given to the place of older people in a rural setting in the UK: focussing on their rising numbers. Following this, there is a short discussion of the importance of out-of-home mobility for this segment of society, and a look at the different journey types being made. This leads into the final context setting, which is a brief introduction to Activity Theory and a consideration of why this could be a relevant mechanism for better understanding current and future mobility scenarios for older people in a rural setting. After a description of the methodology used, the results and analysis from the study are presented. This is followed by a discussion of insights the study has provided on the interaction between mobility and activity, and older people's quality of life (in a rural context). The article concludes by reflecting on implications and recommendations for provision of rural mobility services alongside some areas for further study.

2 Context

2.1 An ageing population

Current projections indicate that the UK population will increase from 65.6 million in 2016 to over 72.9 million in 2041 (ONS, 2017a), with those aged 60 and above increasing from 23% of the population to almost 30% and individuals 75 and older from 8% to 13.4% (ONS, 2017b). This will equate to nearly eleven million people aged 75 and over in the UK by 2041, with over 3 million of them aged 85 or more (ONS, 2017a). In 2016, 17% of the population of England (some 9.4 million people) lived in rural areas (Defra 2018a), yet there are fewer outlets for many services in these areas, implying that other things being equal rural-dwellers will have to travel longer distances to access them (CRC, 2010). Overall, those living in the most rural areas are travelling almost 50 per cent farther per year than those in the most urban areas (Defra, 2018b). As a consequence of limited transport alternatives, this can mean that ownership and use of a car is essential for those that can drive (and can afford it). Reliance on the car can though become problematic for many older people as they may have to ration, or even cease driving as a consequence of physiological decline (Hakamies-Blomqvist, & Wahlström, 1998) or reduced confidence (Persson, 1993), the latter more so

for older women (D'Ambrosio et al., 2008). Women are also more likely to give up driving earlier, and thus risk a longer period without personal means of mobility (Siren & Hakamies-Blomqvist, 2005, Davey, 2007).

Out-of-home mobility has long been recognised for its role in facilitating quality of life for the older population (Cutler, 1972, Farquhar 1995, Metz, 2000, Gabriel & Bowling, 2004, Parkhurst et al., 2014). It is seen to be crucial in respect of enabling independence, and everyday participation in a community (Mollenkopf et al., 2011). More generally, being active and being engaged is seen to be an important component of successful ageing (Adams et al., 2010), whilst a lack of mobility can lead to feelings of isolation, loneliness and depression (Andrews, 2012). In attempting to reflect this beneficial impact of mobility, the focus in this paper is on the notion of subjective wellbeing (SWB), seen as an alternative to measuring utility in a range of domains – including travel. An introduction to SWB in this context can be found in Bergstad et al (2010), whilst Ettema et al (2009) contains a more detailed discussion.

It is important to recognise that those classed as older people are not a homogenous group, as the term can include those aged from 60 to over 100, embracing a variety of differing economic and social conditions and a range of physical and mental health capabilities. In particular, there can be a difference between those seen as the 'younger old' as opposed to the 'older old'. This delineation varies, for example some starting the classification of the latter group at age seventy-five (e.g. Alsnih & Hensher, 2003 in reference to the mobility needs of an ageing population, Lui et al, 2017 - in respect of unmet travel needs), others at eighty (Harper & Walport, 2016 – for loneliness and the likelihood of needing care services), or eighty-five or greater (Key & Culliney, 2018 – in respect of social inclusion). The issue of inclusion in particular reflects the heterogeneity of the term 'older people'. For example, those over eighty are seen to be more at risk of exclusion from social relationships, material goods and basic services than those aged seventy-nine and younger (Barnes et al, 2006), with particularly issues seen around healthcare (Holley-Moore & Creighton, 2015). Those over eighty-five have expressed concerns about 'immobility', being housebound and having reduced social contacts in a study by Farquhar (1995), whilst Key and Culliney (2018) find that this group are more likely to experience social exclusion in respect of both service access and social contact irrespective of factors such as health.

Another key factor to consider when examining out-of-home mobility and older people, is their household circumstances. Do they live alone for example, or with a spouse (or other family members)? Living with a partner (who drives) increases opportunities for lifts (Haustein & Siren, 2014), helping people to continue to meet their essential mobility needs (Alsnih & Hensher, 2003). Having a spouse who drives can also reduce the negative effects of driving cessation on social activity (Curl et al., 2013), and some social contact may also be satisfied at home in this situation (Haustein & Siren, 2014), although potentially the effect of giving up driving by one partner will be reduced engagement for both (Curl, et al., 2015). Having a driving spouse may also help facilitate some people in giving up driving (Freund & Szinovacz, 2002). Gender also has a relevance, older women may be more at risk of mobility restrictions, as a consequence of ceasing to drive before they need to and making up a greater proportion of those aged eighty and above. They are also more likely not to drive, be less well-off and to live alone (being widowed, divorced or never married), with few, if any children to support them in their retirement years (Alsnih & Hensher, 2003). For those men that lose the ability to drive in later life, there is a greater likelihood that their wife may

also by then feel incapable of driving, which can become an issue as men are seen to be more reluctant to call on others to provide mobility (Eberhard & Mitchell, 2009). It is also worth noting, that living alone can potentially increase out-of-home social and leisure needs (Nordbakke & Schwanen, 2015), particularly for those who have been widowed (Hjorthol, 2013).

Faced with reduced mobility older households will need to adopt alternatives if they wish to maintain engagement with local activities and with family and friends. This will almost inevitably mean moving from private, personal mobility in the form of a car, to a *shared mobility*, public transport, community transport or taxis for instance. It is likely that shared options will be less flexible than private solutions. Overall then this suggests that when looking at the transport behaviours of older rural citizens, it will be important to remember that this is a heterogeneous group who are drawing on a range of mobility resources.

2.2 The importance of discretionary travel

It is also relevant to explore the range of journeys being made, as trips for different purposes may provide different benefits to older people. Various classifications have been proposed in this context, often developed from a 'hierarchy of needs' first articulated by Abraham Maslow in 1943. For example, Musselwhite and Haddad (2010) offer a three-tier model based on needs to be satisfied through mobility: *utilitarian* (primary needs derived from demand and accessibility); *affective* (secondary needs related to control and independence); and *aesthetic* (tertiary needs such as the need to enjoy the journey). Alternatively, Hjorthol (2012) in a paper looking at unmet transport needs refers to the earlier work by Allardt (1975 in Swedish) which categorised an individual's (welfare) needs as *having*, *loving* and *being*, to which the later paper added mobility as an enabler.

These classifications suggest a distinction is possible in respect of journey purpose. With utilitarian journeys that are routine, and essential for a normal standard of living (Nutley, 2003), or for the necessities (Kenyon et al., 2003), and those which fulfil the other levels which are more discretionary - albeit they contribute to quality of life and offer the psychological benefits of getting out and about, (Davey, 2007). There is recognition of the problems caused by shortfalls in necessary journeys, and an understanding of the role that such mobility-deficits might play in exclusion, from employment, healthcare and education for example (Kenyon et al., 2003). This in turn has led to many policy initiatives to try and meet these needs (i.e. hospital transport, community transport etc.). What has perhaps been seen to be less important for policy-makers has been support for more-discretionary travel, recognising that this can be important in facilitating social participation (Gaffron et al., 2001), and that such journeys can have a positive impact on wellbeing for older people (Davey, 2007). Benefits (at the affective and aesthetic levels) may be lost when private transport is not available (ibid), or where alternatives are overly formalised and suffer from a lack of spontaneity (Musselwhite, 2017). Thus, ensuring that this discretionary travel is properly considered, and then effectively supported, could be particularly important for older people who may have restricted (or no) access to a car.

2.3 Activity theory

Further disaggregation of those journeys seen as discretionary could provide even greater clarity as to which activities being undertaken by older people are most beneficial and would assist policy-makers and transport planners in best deploying scarce mobility resources. One way to do this is to draw on the links between participation and wellbeing in older adults

that are already identified in gerontology studies (Adams, et al., 2010). Social gerontologists have explored these links over the last half-century or more through the concept of activity theory, developing a three-part typology of *informal*, *formal* and *solitary* activities. In turn, these describe social interaction with familiar people such as relatives, friends or neighbours, participation in formal groups and organisations, and activities undertaken alone, such as reading, watching TV and (some) hobbies. It is suggested that it is 'informal engagement' which has a greater influence on wellbeing than either formal or solitary activity (Lemon, et al., 1972, Longino & Kart, 1982. Ritchey et al., 2001, Adams et al., 2010). Family and social activity are amongst those most highly associated with life satisfaction (Warr, et al., 2004), particularly for women. Gerontologists have put forward a number of reasons as to why such informal activity might have this impact on wellbeing (echoing the conclusions of Metz, (2000) writing from a mobility perspective about the quality of life of older people). These include the physical benefits of movement itself, social support (through emotional closeness and assistance) and social interactions - which promote a sense of belonging and establish or maintain positive interpersonal attachments (Adams, et al., 2010). However, others find inconclusive empirical evidence to support the theory, and suggest that it is necessary to consider the relationship between activity and wellbeing in a broader conceptual framework, taking note of factors such as the quality of social relationships, health and other socio-economic factors (Litwin & Shiovitz-Ezra 2006).

2.4 Transport and wellbeing

The contention of this paper is that access to mobility is another factor that should be considered in this framework, and in particular the role of discretionary journeys which could facilitate all three activity types. By their very nature, out-of-home activities rely on reaching the locations where activities take place. Many studies have explored and attempted to measure the relationship between mobility and wellbeing over the last half-century (e.g. Cutler, 1972. Ettema et al., 2010, Bergstad et al., 2011, Stanley et al., 2011), with positive links found in respect of subjective wellbeing. Conversely, mobility deficits, will affect the ability to undertake such activity, with insufficient mobility linked to 'social exclusion' for some people (e.g. SEU, 2003; Gray, 2004), and more widely, negative effects recorded on an individual's health and wellbeing as a result of social 'isolation' (Holt-Lunstad, et al., 2010).

2.5 Testing the link from mobility to wellbeing

The discussion so far has made the case that mobility will affect the individual emotional wellbeing of older people via their engagement in activities. What the study will now look to test is how evident that relationship might be for individual wellbeing in a sample of older rural dwellers. This relationship is explored in more detail through the following two questions:

Q1. *How does the level of out-of-home mobility afforded to a person relate to their ability to be involved in activities (solitary, informal and formal)?*

Q2. *Is there evidence of a link between these activities (and specifically informal activity), and subjective wellbeing for the participants in this study?*

3. Methodology

The data underpinning the analyses reported in this paper are drawn from *The Grey and Pleasant Land?* (GaPL) project, a UK Research Councils funded study exploring the connectivity, and connectedness of older people in rural communities in the UK undertaken between 2009 and 2012 (see Hennessey et al, 2014 for details of this project). The data are

now available through the *ReShare* online repository, which gives (largely) open access to anonymised data from UK social and behavioural sciences research. Whilst the data set used here is now almost 10 years old, it is particularly well suited to an exploration of activity theory, as it poses questions about each of the three activity types, as well as mobility and wellbeing. A recent search (October 2018), did not reveal any more recent data with the same characteristics on the repository. It is also the case that since the data were collected, there has been an ongoing reduction in transport choices available to older rural citizens, and a growing use of the car as the primary mode of transport. Thus, it is suggested that the findings will still remain pertinent and may under-represent current conditions.

The data contains survey results from 920 participants aged sixty and above in Southwest England and Wales. Three pairs of communities were chosen, with each pair reflecting a different degree of rurality (based on a scale of population density and closeness to urban areas). The definition of rural is that developed and used by the UK Government (Defra 2010), and the methodology and rationale for the areas selected is covered in detail in Hennessey et al (2014). The survey deployed by the project followed a stratified random sampling approach, and broadly reflected the national age-structure for over-60s in the study areas, with a slight bias towards women in the gender split. Participants were contacted at their residences, face-to-face, with the interviewer-completed survey lasting around 30 minutes. The survey comprised sections on: sense of belonging and issues of concern; the extent of participation in activities within and beyond the community and perceived barriers to participation; social networks and availability of support; transport and access to services; use of media and telecommunications; as well as health and socio-demographic information (ibid). Some participants did not record their access to a car or age, and removing these cases leaves 849 valid responses. These data have been analysed descriptively and statistically using SPSS software.

The data have been further classified into three groups based on combinations of age and access to a car in a household (with no distinction being made between drivers and passengers in this question) – see Figure 1.

Group 1. Those with access to a car, aged from 60-74 (n=551).
 Group 2. Those with access to a car but aged 75 or over (n=190).
 Group 3. Those without access to a car in their household (n=108).

Figure 1 Classification of mobility groups

The 75 and over breakpoint in the data has been chosen to reflect a period when people may be thinking about either reducing or even ceasing to drive. This may result in older drivers self-regulating (limiting) driving as a strategy for continuing to drive safely (Meng & Siren., 2012) or as a result of a changing lifestyle (Molnar et al., 2013). The former might reflect physical health issues such as declining eyesight, or the desire to avoid busy roads or poor weather for example or their confidence as drivers (Carmel et al., 2013). So, whilst older people may still have a driving licence and own a vehicle, they might only make limited use of it, for example for necessary purposes such as getting to the doctors or shops during the daytime, and in good weather. Using this breakpoint also allows this article to reflect on groups identified by Haustein & Siren (2015) in their review of literature segmenting older people in respect of their mobility. These were: a) active car-oriented; b) car-dependent but restricted in mobility and c) dependent on public transport and other services. It is possible to an extent to replicate those groups in the data here, thus moving beyond the more traditional

consideration of those who do or don't have access to a car, to also explore an older population who potentially are self-restricting their driving. A fourth group in the Haustein and Siren analysis, *mobile and multi-modal* was seen to be less evident in high car-dependency locales – a situation pertaining in the rural areas in this current study (e.g. up to 90% of households had access to a car) and is thus not used here.

General demographic data for the sample are presented in Table 1. Overall, the mean age of participants was 71.5 years. Most participants were married (69%), but over a fifth (21.2%) were widowed. The majority of the sample lived in households comprising the participant and a spouse (59.5%).

Table 1 Demographic Characteristics of sample

	Sample (N=849) %	Group 1. Car access <75 (N=551) %	Group 2. Car access >74+ (N=190) %	Group 3. No car (N=108) %
Female	58	57.5	52	72
Male	40	41	46	24
<i>Missing responses</i>	2	1	2	4
Age				
60-74	68	100		23
75-84	23		86	32
85 and above	9		14	44
Marital Status				
Single (never married)	4	3	6.4	5
Married / Partner	69	83	59	16
Separated / Divorced	5.6	6.3	3	6.5
Widowed	21	7.4	31.4	72
Living alone	30	17	38	81
Lived here:				
<10 years	35	40	27	26
11-20 years	20	20	23	12
21-30 years	16	16	18.5	17
>30 years or always	29	24	32	45

Note: Rounding may mean totals do not add to 100%

Group 3, those without car access, were more likely to be female, and older, and to have lived in their current community longer than those who were younger and had access to a car. Over 80% lived in single person households. 45% of the group stated they had lived in their rural location for thirty years or more. Within group 3, one-third (36 people) claimed to have never driven a car or motorbike/moped or possessed a licence to do so. A further 23 respondents stated they had not driven for at least 10 years. These participants may then have been better able to cope without a car, being more familiar with alternatives, and having developed mechanisms to address their mobility needs over time.

4. Results

4.1 Levels of mobility

Evidence for differences in mobility and the ability to access resources across the groups can be seen in the results of the transport-related questions presented in Table 2 below.

Table 2 Mobility indicators

	Group 1. Car access <75	Group 2. Car access >74	Group 3. No car access	No of responses
Vehicle mileage				734
Annual mileage < 5k (%)	26.1	39.6	n/a	
Annual mileage 5k – 10k (%)	34.0	34.2	n/a	
Annual mileage > 10k (%)	34.5	17.1	n/a	
No of modes of transport used in last month (mean)	2.31	1.57	1.14	849
Lack of transport is a barrier to involvement in community activity (%)	14.1	15.6	66.6	689
Concerns about poor public transport in community (%)	62.7	50.5	47.1	822
No of facilities and services difficult to access (mean)	1.92	1.76	4.62	846
SD	3.49	3.24	6.31	

Note: Not all participants in the sample answered all of these questions.

Around 26% of Group 1 travelled less than five thousand miles per annum whilst this was the case for nearly 40% of Group 2. Conversely, 34% of Group 1 claimed an annual mileage over ten thousand miles compared to 17% of Group 2. In respect of (local) modes of transport used in the last month, participants were offered six options, ranging from walking to buses. Those in Group 1 used the most modes in the last month, with almost all of them using their car and walking, and nearly 30% of them also using a bus. In Group 2, 75% had used a car, 62% had walked and only 10% had used a bus, whilst for Group 3, 59% had walked and 35% had used a bus. Group 3 reported a lack of transport as being more of a barrier to their involvement in community activity than the other two groups, but it is Group 1 (car users under 75) who counterintuitively expressed the most concerns about 'poor quality' public transport in their community. Group 3 also reported more problems with accessing a range of services and facilities than those with access to a car - participants were asked about twenty such options, including hospital, supermarket, cinema etc.

4.2 Levels of activity

Participants also provided data on each of the categories of activity (solitary, formal and informal) with separate questions relating to informal activities with family and with friends. Solitary activity describes pastimes or hobbies which participants undertook alone at least once a month, with the response providing a count for each person. The surveyor had a list of twenty-four potential choices (including 'other') available if a prompt was needed but used this list only if it was deemed necessary. Formal activity consisted of twelve sets of activities relating to groups or organisations (e.g. church, school, trade union etc.) The response to this question provided a count for each person of activities undertaken. Participants were also asked separately if they undertook volunteering activity – deemed a 'formal' activity here. For measures of informal activity, participants were asked questions about the

frequency of their physical interactions with their family and friends (not merely phone calls or online communication). Available choices ranged from daily to never for both questions.

The number of solitary activities undertaken was similar across the three groups. The median number of activities undertaken was 3.00. A Pearson Chi-Square test did not suggest any significant relationship to the mobility group variable (χ^2 27.797, Df 26, $P = .276$). The response to the other activity questions, broken down by mobility group, are presented in Table 3.

Table 3 Activity undertaken - by mobility group

	Group 1. Car access <75 (N=551)	Group 2. Car access >74+ (N=190)	Group 3. No car access (N=108)	Sample (N=849)
Formal activity within 1 mile of home (%)	59.0	61.6	42.6	57.5
One formal activity > 1 mile from home (%)	24.0	21.6	14.8	22.3
More than one formal activity > 1 mile from home (%)	19.5	14.7	6.5	16.6
Undertake voluntary work (%)	44.7	34.0	13.0	38.2
Informal activity – Family (%)				
Daily	15.1	15.8	24.5	16.5
2-3 times a week	12.2	19.5	14.2	14.1
At least once a week	19.7	17.9	22.6	19.7
At least once a month	22.1	20.0	15.1	20.7
Less than once a month	28.1	17.4	17.9	24.4
Never or n/a	2.7	9.5	5.7	4.6
Informal activity – Friends (%)				
Daily	24.1	22.6	33.3	25.0
2-3 times a week	27.1	26.8	31.5	27.6
At least once a week	30.0	28.4	16.7	27.9
At least once a month	9.6	13.7	7.4	10.2
Less than once a month	4.4	2.6	3.7	3.9
Never or n/a	4.8	5.8	7.4	5.4

There is a clear difference in participation in formal activity between the two groups with access to a car, and the group without, broadly a rate a third lower for the latter. However, even for those with access to a car, the proportion engaging in more than one formal activity at a distance from their home falls to less than 20%, with Group 2 a third lower, and Group 3 two thirds less this time. In response to the volunteering question, the younger driver group gave higher levels of positive response than the older driver group, with a much lower level of voluntary activity for the non-drivers.

Perhaps the most interesting aspect of the data in respect of informal activity is that those without car access (Group 3) appear to have higher levels of more-frequent interaction with

both family and friends, than the other groups. Over 28% of Group 1 stating they have less than monthly contact with family compared to around 18% for the other participants, and almost 25% of Group 3 claim daily contact with family as opposed to only 15-16% in the other two groups. It was also notable that across all three groups, around 80% of participants had at least weekly engagement in activity with friends, although for group 3 this was biased towards daily activity.

4.3 Analysis of the relationship between mobility and activity

The first question posed in this analysis asked whether the level of out-of-home mobility afforded to a person related to their ability to be involved in activities (solitary, informal and formal). To explore these potential connections further, a series of binary logistic regression models were constructed in IBM SPSS 24, using the four activity types as dependent variables. Mobility group was tested for effect, whilst controlling for a range of socio-demographic factors (a test for multicollinearity across variables identified no issues). Results are presented in Table 5 and discussed below.

Table 4 Results from Mobility/Activity binary logistic regression tests

Model:	Solitary activity		Formal activity		Informal activity (family)		Informal activity (friends)	
	OR	P	OR	P	OR	P	OR	P
Mobility Group ^d		.564		.001 **		.396		.811
Group 1	1.458	.328	3.228	.001 **	.653	.175	.783	.560
Group 2	1.101	.763	2.584	.001 **	.809	.427	.945	.867
Rurality ^e	.835	.322	.717	.052 *	.932	.643	.714	.067
Health ^e	.730	.281	.603	.064	1.220	.442	1.400	.321
Living alone ^e	1.664	.027 *	.853	.439	.940	.731	1.955	.006 **
Financial wellbeing ^e	.810	.275	.810	.245	1.389	.042 *	.786	.220
Age (group) ^d		.699		.443		.912		.096
60-69	1.119	.756	1.317	.210	1.051	.785	.890	.606
70-79	1.241	.463	1.205	.579	1.137	.669	.455	.041 *
Gender [*]	.487	.000 ***	.588	.002 **	.819	.177	.751	.114
Model fit								
Model P-value		.000 ***		.000 ***		.083		.008 **
Nagelkerke R ²		.058		.078		.025 *		.042
Hosmer & Lemeshow test		.063		.470		.900		.738

* P <.05,

** P <.01,

***P <.001

^d Mobility group is compared to Group 3 (no car), age group to 80 and above, and gender to female.

^e These variables test a perceived poorer situation, a more rural area, having health issues, living alone as opposed to with others and being financially less well off.

4.3.1 Solitary activity: The strongest effect appears to be living alone, although interestingly being in mobility Group 1 also suggests slightly more likelihood of undertaking solitary activity compared to those without access to a car. Gender and living alone are the only factors significantly related to this type of activity. Although the model itself is significant, it scores poorly on other fit characteristics.

4.3.2 Formal activity: Mobility group is significant here, with Group 1 over three times as likely to participate in formal activity compared to those without a car, and Group 2 two and a half times. Being in a more rural area, having poorer health, less money and living alone all seemingly reduce the likelihood of taking part in formal activities. Rurality and gender are the only other factors significantly related though, with the younger age groups slightly more likely to engage in formal activity and men less likely to engage. Again, the model is significant while scoring poorly on other fit characteristics.

4.3.3 Informal activity (Family): Access to a car seemingly decreases the likelihood of engaging in weekly activity with family compared to those without, whilst poorer health and finances slightly increase the likelihood. It is only the latter explanatory variable that has a significant P value. This model is not significant, although the H&M test provides a better result (fit) this time.

4.3.4 Informal activity (Friends): Living alone seems to double the likelihood of informal activity with friends and is the only significant explanatory variable. As for family informal activity above, access to a car appears to reduce the odds of activity compared to those without car access. This model is significant, but again scores poorly on fit characteristics.

4.4 Analysis of the relationship between activity and wellbeing

The second question posed by the study looked for evidence of a link between activities (and specifically informal activity), and SWB, although it is recognised that even if significant associations are found, it is not possible in this study to necessarily establish causal influence. Whilst activity may influence SWB there is a possibility of an effect in the opposite direction, with those older people with more positive SWB engaging more in activities in their community (Warr et al., 2004). It is also the case that the data set used here did not contain a recognised measure of subjective wellbeing, so instead, two questions that reflected on the state of mind of the participants were selected as a proxy (see Figure 2).

Question	Possible responses
<i>I experience a general sense of loneliness</i>	Agree / Disagree / Don't know
<i>During the last four weeks, how much have you been bothered by emotional problems (such as feeling anxious, depressed or irritable)?</i>	Very much / Quite a lot / Moderately / Slightly / Not at all

Figure 2 Pseudo-wellbeing questions in the survey

Both indicators were transposed into dichotomous variables. For the loneliness question the 'don't know' responses were added to the 'agree' response to reflect the potential for under-reporting of such issues (see De Koning et al., 2016 for a justification for this approach). The emotional problems indicator was split at the moderately/slightly boundary.

The potential connections were again explored using binary logistic regression models. This time using the two pseudo-wellbeing indicators as dependent variables and testing the activity types as explanatory variables. The models again controlled for a range of socio-demographic variables as well as mobility group. Results for these models are presented in Table 5 and discussed below.

Table 5 Results from Activity/Wellbeing binary logistic regression tests

Model:	Loneliness		Bothered by emotional problems	
	OR	P-value	OR	P-value
Solitary activity ^d	.571	.068	.805	.386
Formal activity ^d	1.352	.223	1.046	.846
Informal activity (Friends) ^d	1.426	.115	1.186	.393
Informal activity (Family) ^d	1.472	.144	1.439	.134
Rurality ^f	1.140	.573	.671	.071
Health ^f	1.555	.214	4.066	.000 ***
Living alone ^f	1.726	.038 *	1.234	.395
Financial wellbeing ^f	1.074	.771	1.964	.001 **
Age (group) ^e		.076		.532
70-79	1.460	.188	.893	.662
80+	2.910	.023 **	1.295	.544
Gender ^e	.977	.923	.803	.309
Mobility Group ^e		.239		.640
Group 2	.530	.126	.715	.365
Group 3	.794	.624	.851	.714
Model Fit				
Model P-value		.003 **		.000 ***
Nagelkerke R ²		.073		.096
Hosmer & Lemeshow test		.848		.207

* P <.05,

** P <.01,

***P <.001

^d Activity variables are tested as no activity (solitary, formal) and less than weekly (informal).

^e Age group is compared to 60-69, gender to female, mobility group to Group 1.

^f these variables test a perceived poorer situation, a more rural area, having health issues, living alone as opposed to with others and being financially less well off.

4.4.1 Loneliness indicator: There is some indication of increased likelihood of being lonely if participants do not engage in formal and informal activities, with less likelihood if solitary activities are not. Age appears to be the most important factor here, those 80 or older three

times more likely to experience loneliness than the 60-69 age group. Living alone and health also seem relevant factors, the former a significant result. Interestingly, both Group 2 and 3 are less likely to be lonely than Group 1. This model is significant, and the H&M test implies some fit for the model.

4.4.2 Bothered by emotional problems indicator: Informal activity with friends appears to be the most relevant of the activities, with a lack of this activity slightly increasing the odds of being bothered by emotional problems. The key factor would appear to be poorer health, which increases the likelihood of being bothered fourfold, although financial wellbeing also has an effect (and the result is significant). As for loneliness, the mobility groups show a slight reduction in the odds ratio for both Group 2 and Group 3 compared to Group 1. This model is significant, but as before has issues in respect of fit.

5. Discussion

From the results reported above it is possible to see a clear distinction between the two groups with access to a car and those without in relation to their experience of out-of-home mobility. There are visible transport-related issues in relation to engagement with community activity for example. The non-car group also has more problems in relation to reaching services and facilities, highlighting that potentially their mobility shortfall is affecting travel for the necessities of life, as well as for more discretionary purposes. It is also possible to see some evidence of reduced travel in the older driver group, reflecting an expectation that this group could be self-restricting driving to avoid conditions and circumstances seen to make driving more problematic. This group is also becoming less flexible in their use of other modes of transport, likely reflecting other factors such as personal health. Thus, they are less likely to be using public transport than either the younger drivers or the non-car group. The car then is an important mobility aid, supporting those that might struggle to walk to a bus stop, and providing much greater range than a mobility scooter for example – although all predicated on the driver still being able to safely operate the vehicle and get in and out of it. The ability to retain car access, even when it becomes difficult to access other modes is though dependent on self-certification of ability in order to retain a licence, and driver assistance technology. The balance between the benefits of mobility, and safety of drivers and other road users may then present some ethical and moral challenges in some situations.

Turning to engagement in activities, earlier studies (for example Marottoli et al., 2000, Siren & Hakamies-Blomqvist. 2004), suggest that without access to a car, activity levels for older individuals will be lower. In the data here, there is a clear difference in the ability to undertake formal activity between those with access to a car and those without. What is interesting though is that formal activity is still often taking place relatively close to home, for all groups, thus avoiding the situation where those living more distant from communities and without sufficient transport may experience poorer life satisfaction – as noted in much earlier research in the US by Cutler (1972). Potentially it is not the car that is facilitating all journeys for these formal activities – and thus maybe it is less important as an enabler, with other factors such as health emerging as relevant. There is a clearer pattern in respect of volunteering though, with a gradient of engagement from the younger car drivers to very limited involvement by the non-car group, consistent with declines seen in studies of the effects of driving cessation (for example, Curl et al., 2013). There are perhaps some

important lessons to be learnt from this in respect of providing sufficient means of mobility to allow older people to retain their involvement in volunteering.

The data in respect of informal activity have also proven to be interesting, with contact between those without car access and their family and friends higher than the other groups. This at first seems counterintuitive but may reflect several factors. The first is that those without car access may have made a location choice to be near(er) their family, facilitating more regular contacts – whilst the younger group may well have moved to an amenity location in a rural area which may be some distance from family. Secondly, that without use of a car people have developed their networks of friends in the immediate locale, reducing the need to travel. Thirdly, by using modes such as walking, public transport and perhaps lifts they are more likely to engage with others whilst travelling, and again develop friendships more locally. Finally, by (transport) necessity, and as reported in earlier articles based on this data set (Shergold and Parkhurst., 2012, Shergold et al., 2012) they may be undertaking activities locally, again reinforcing local friendships. Litwin & Levinson (2017) also note that social networks may play a role for those with personal mobility constraints, mitigating the impact of limitations on their engagement in activities. This may be a factor in these results as well, perhaps via support such as lift giving. Thus, in response to the first research question posed in this article, there do seem to be some clear links between access to mobility and involvement in formal and informal activity. Although it may be the case that the relationship between mobility group and informal activity may be in the opposite direction to that which might be expected, with more mobility leading to less activity.

It has been more difficult here to consider the second question, of a relationship between activity (informal, formal and solitary) and SWB. The literature suggests that generally there will be positive associations between activity and wellbeing (Adams et al., 2010), with informal activity having a greater influence than other activities (Lemon, Bengtson & Peterson, 1972, Longino & Kart, 1982, Warr, Butcher & Robertson, 2004, Adams et al., 2010). Informal activity does emerge as being a more important factor than the other two activity types, however health and age appear to be more relevant contributors to the pseudo-wellbeing indicators explored here. A stronger effect in respect of activity with friends compared to family, was noted in the earlier findings of Lemon et al (1972), but that was not replicated here.

More generally, there is a body of academic work around mobility and wellbeing which acknowledges links between community involvement and wellbeing (Stanley and Stanley., 2007, Stanley et al., 2011) and that travel is related to well-being – mainly through activity participation (Bergstad et al., 2011). In particular, being able to drive is seen to bring benefits in getting to places, being independent and strengthening decisional autonomy, all adding to well-being in later life (De Vos et al., 2013). This analysis has highlighted the connection between access to a car and the ability to be involved in formal activity, and particularly volunteering. What is less clear is if there is a more direct link from mobility to wellbeing as proposed by some (Vella-Brodrick, D. a., & Stanley, J. 2013), particularly in respect of the relative importance of informal activity which as seen here is less dependent on access to a car.

6. Conclusions

It is suggested that shortfalls in respect of discretionary travel may impact negatively on both personal wellbeing and on wider community cohesion through restrictions on individual 'activity' and the wider impacts of this on a community. In the case of the latter this may undermine the 'social sustainability' of a rural community, locations that growing numbers of older people choose to live in. This study set out then to understand more clearly the role that discretionary travel might play and found links between access to mobility and involvement in formal and informal activity. There appears to be a clear link between access to mobility, in the form of a car, and the ability to be involved in formal activity, including volunteering, with a gradient of engagement from those with access to those without. In respect of informal activity, the findings are counterintuitive, and those without car access seemingly enjoy more frequent interactions with friends and family. This may be for a number of reasons, including necessity and adaptation to circumstances. What was less easy to determine in detail (with this sample and this data) was the effect of different activity types on self-reported wellbeing, although some links were seen from informal activity to both the loneliness and mental wellbeing indicators. In both instances, though stronger effects were seen with factors such as physical health and age.

What has also emerged is that formal and informal activity is taking place relatively locally, and this has implications for those planning and delivering mobility in these communities. It may mean a different emphasis going forward in respect of the focus of attention for allocating resources to optimise benefits for older people and their communities. This might mean greater spending on the local walking environment for example than on public transport services to more remote destinations. There are also important messages in respect of potential wellbeing benefits for individuals (not least issues of loneliness as indicated here). Confirming the link from mobility to loneliness and noting the role of informal activity again suggests areas of focus that might help, with an emerging picture of localised informal and formal activity helping individuals (and their community). It is feasible to see how encouragement and investment locally, and perhaps the community spaces to facilitate it would again be beneficial.

This study has considered older peoples wellbeing through an innovative combination of activity theory and mobility. This has proven to be helpful in facilitating a disaggregation of discretionary travel and providing a framework against which to consider mobility need and benefit. As noted earlier, empirical evidence relating to activity theory can be inconclusive (Litwin & Shiovitz-Ezra 2006), and that is also born out to an extent here – particularly in respect of informal activity.

This study has used a sample drawn from a rural context in the UK, but it is evident that the issues explored are pertinent to other groups in other contexts (suburban, urban even) as a consequence of economic factors (e.g. the costs of motoring), or ongoing reductions in travel alternatives (both commercial and state-sponsored). Attempting to identify solutions to mobility-deficits for older rural citizens thus provides an opportunity to draw lessons from their experiences, seeing them perhaps as being in a vanguard of reduced mobility which may affect others in the future. Further studies (rural and otherwise), using acknowledged measures of wellbeing, would be helpful to update our understanding of these issues, particularly in light of continuing developments in technology across mobility, communication and health, all of which could affect 'activities'.

6.1 Limitations and future direction

Unlike some of the other attempts to quantify the link, this study did not use an established measure of subjective wellbeing, and thus the two proxies used here may be imprecise, and imperfect indicators to use. Other researchers have used a range of formal measures when looking at this concept, often measuring life satisfaction (e.g. see Cutler., 1972, Warr et al., 2004, Ettema et al., 2010, La Grow et al., 2013 for a selection of approaches). Consideration and selection of an appropriate test to use in any future data collection would greatly assist in contributing to knowledge around activity. Another potential shortcoming in this study is the age of the data set used. Collected in 2009, it could be argued that the sample data no longer reflects rural communities of older people in England and Wales. As defended in the method section above though, it is difficult to see that conditions have changed for the better in respect of mobility solutions in rural communities over the intervening years, and if anything, dependence on the car will have increased.

It would though at a time of continuing decline in rural mobility options outside of the car be provident and informative to collect new data that addressed the issues noted above and facilitated a more effective examination of the questions raised here. What is apparent is that there are links between these factors, and an opportunity to better contribute to the debate around activity theory. More specifically, it would be very interesting to explore the role that volunteering plays – in a society (the UK) increasingly reliant on this sector to provide services to the wider community.

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