DO THEY TRAVEL TOO MUCH? A DEFINITION OF EXCESS TRAVEL AND A CASE STUDY OF EXCESS TRAVELLERS IN TYNE AND WEAR, UK

FRASZCZYK, Anna, PhD student at Newcastle University, anna.fraszczyk@ncl.ac.uk

MULLEY, Corinne, Prof at ITLS, University of Sydney, corinne.mulley@sydney.edu.au

ABSTRACT

Excess travel is a concept that has been the focus of research in the last 30 years. Excess travel recognises that for some people there is some utility from their travel itself and this has led to a recent renaissance of interest in this theory with developments in empirical research on the value of time (VOT) which currently assumes travel is all disutility. Whilst the literature has concentrated on non-work trips, this paper reports a study on commuting behaviour where it might be expected to find less excess travellers.

The excess travel research based on commuting reported here aims: to review existing definitions of excess travel and present a new improved one; identify if excess travellers exist at all and if so, are there differences between excess travellers and non-excess travellers in terms of their attitudes to travel and socio-economic characteristics.

The research is based on two different methods of identifying excess travellers and both show a small number of excess travellers in their commute. A better understanding of excess commuting is a pre-requisite to encourage improvements in sustainable transport patterns of commuting and for public transport providers to market excess travel time into activity time with potential to create extra revenue.

This paper is based on a pilot study and a small sample of respondents. The aim of this stage was to test ideas and verify analysis which will be used in the main study.

INTRODUCTION

Excess travel, which is often with travellers travelling more than they need, is a concept that has been the focus of research since the early 1980s. There has been a recent renaissance of interest in this theory, at least in the UK, with developments in empirical research on the value of time (VOT). VOTs are used in many policy grounds and are based on the concept that travelling time is total disutility with the assumption that people only travel in order to "consume" something at their destination.

This paper focuses on travel to work. In the next section a short critical review of existing definitions of excess travel focused on travel to work is presented and an improved definition is put forward which takes account of new variables. The methodology section which follows shows how this new definition is used as the basis to identify whether excess travellers (ETs) exist in the journey to work context and to identify differences between ETs and NETs (non-excess travellers) through the use of a survey instrument. The survey instrument asked respondents to describe their daily travel to work and transport modes, a number of attitudinal statements, theoretical questions (e.g. about teleportation phenomenon) and socio-economic characteristics. The sampling was undertaken using two contrasting strategies of sample selection to identify the best method of data collection. The first method was to select individuals by their origin: for this, census data is used at the most disaggregated level of the Super Output Level, (SOA) together with Geographical Information System analysis (GIS) to identify "hotspots" which meet a number of criteria. The second method was to investigate individuals at their working destination.
The analysis section describes the way in which time and cost calculations have been used to identify ETs and NETs and how these are compared with the generalised cost definition recommended by British Department for Transport. This section also reports on the exploration of differences between ETs and NETs in terms of their travel attitudes. A final section concludes identifying the contribution of this research to the knowledge on excess travel.

LITERATURE REVIEW

The first definition of excess travel, in context of travel to work studies, appeared in transport research in early 1980s, when Hamilton published his work based on case study of US and Japanese cities (Hamliton, 1982). His paper compared commuting time in these two countries and concluded that geography and topography play an important role when considering excess travel in monocentric models of urban forms (Japanese cities were more compact than US and as a consequence had less excess travellers). Since Hamilton, the transport literature identifies many definitions describing excess commuting, all of which include some spatial element and underline the difference between the "optimum" travel distance and the real distance travelled by individual. Four of the most compact are presented below in chronological order:

> Definition 1: "the difference between total actual highway use and the use that would have resulted if all such travel had been made by using optimum route"
>
> King and Mast, 1987
>
> Definition 2: "the proportion of the actual commuting distance above the optimum"
>
> Frost et al., 1998
>
> Definition 3: "the difference between the actual average commute and the smallest possible average commute"
>
> Ma and Banister, 2007

> Definition 4: "the gap between observed commuting and the theoretical minimum commute"
>
> Horner and O'Kelly, 2007

Hamilton (1982) has been followed by a number of studies looking to identify the factors influencing excess travel behaviour and Table 1 gives a selection of those which have been identified as important. The selection has been made to show the wide variation in factors that have been explored with no real consensus as to which are likely to be the most important.

***Table 1** – Selected factors identified as causing excess travel in the literature*

Author	**Factors causing excess travel**
Hamilton, 1982	Topography of cities
	Multiworker household
	Heterogeneous housing & jobs
	Other travel
	Travel time v. distance
King and Mast, 1987	Route selection
	In the highway information system
	Route following skills
	Route planning
	Efficiencies in necessary route planning information
Frost et al., 1998	Decentralisation of employees
Mokhtarian and Salomon, 2001	Activities that can be conducted while travelling
	The activity of travelling itself
Ma and Banister, 2006	Multiworker household
	Tenancy
	Uncertainty of job location
	Rapid job turnover
	Decreasing importance of commuting
	Social factors
	Transport policy
	Geographical boundaries
Horner and O'Kelly, 2007	Context of other activities
Jain and Lyons, 2007	The need for transition time

Source: this research

It is clear that of these different factors, some are under the traveller's control e.g. familiarising themselves with topography and routes followed or planning other activities in advance whereas others e.g. transport policy, are not.

In investigating the phenomenon of excess travel, a number of different methodologies have been used (e.g. investigation of actual trips, staged trips, route mapping, simulations, secondary data) and these studies have been based in a number of different countries. To

illustrate this, Table 2 shows the results of excess commuting research based in different parts of the world.

***Table 2** – Selected research results on excess travel*

Author	Year published	Study area	Trip purpose	Mean excess Distance [%]	Mean excess Time [%]
Jansen	1966	San Francisco, US	Work	+5.7	+9.8
Bovy	1981	Eindhoven, Netherlands	Work to home	+7.2	+13.2
Hamilton	1982	14 US cities and 27 Japanese cities	Work	+87.1	+70.0
Merriman	1995	Tokyo, Japan	Work		+15.0
Chen	2000	Taipei, Taiwan	Work	+79.9	
Buliung and Kanaroglou	2002	Toronto, Canada	Work	+65.0	
Manning	2003	London, UK	Work	+55.0	
Rodriguez	2004	Bogota, Colombia	Work	+47.0	
Ma and Banister	2006	Seoul, South Korea	Work	+51.3	+30.2
Niedzielski	2006	4 Polish cities	Work	+47.95	

Source: Adapted from King and Mast (1987) and Ma and Banister (2006)

This shows a wide variation for those studies concentrating on the mean excess distance and a similar dispersion (although with less observations) for studies looking at the mean excess time travelled. In Table 2, the results of excess travel are presented as a percentage of distance or time and it is clear that the use of a spatial element is not frequently used in studies although geographical and topological attributes are important determinants of travel time and alternative travel journeys. It is also clear that different journeys can involve the traveller in different levels of effort – a shorter journey with more changes versus a longer journey with less or no changes. The idea that effort is involved in travelling has been recognised relatively recently in the transport literature by Stradling (2000) who classified different types of effort when undertaking journeys (including physical, cognitive and affective effort). This research posits that effort is an additional dimension that should be taken into account in the definition of excess travel and this is discussed more in the development of the new definition proposed in the next section.

The literature referred to above suggests that a new definition of excess travel should take into account the four main variables of time, cost, distance and effort. The relationships between these variables, in terms of excess travel, are very often close and are presented on Figure 1.

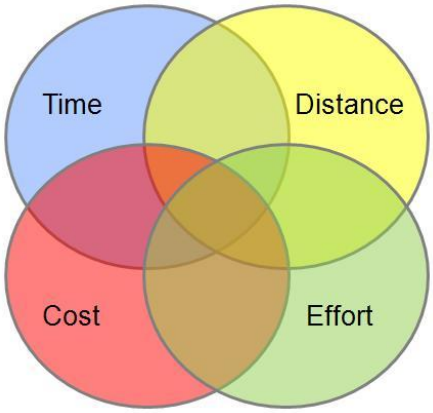

***Figure 1** – Relationship between the four factors influencing excess travel*

The definition of excess travel offered below, and firstly published by Barr, Fraszczyk and Mulley (2010), is based on previous research, but more visibly highlights importance of cost and effort as follows:

> Excess travel is when the journey chosen is either more expensive but slower than an alternative (option A on Figure 2) or needs more effort than an alternative journey costing the same and taking the same time (option B on Figure 2) or is more expensive, more distant and more time-consuming than an alternative (option C on Figure 2). Taking longer but costing the same or more is a way of saying that the individual must be deriving some utility from the travel itself and not just from whatever is to be consumed at the destination and can arise from an enjoyment or affinity for travel.

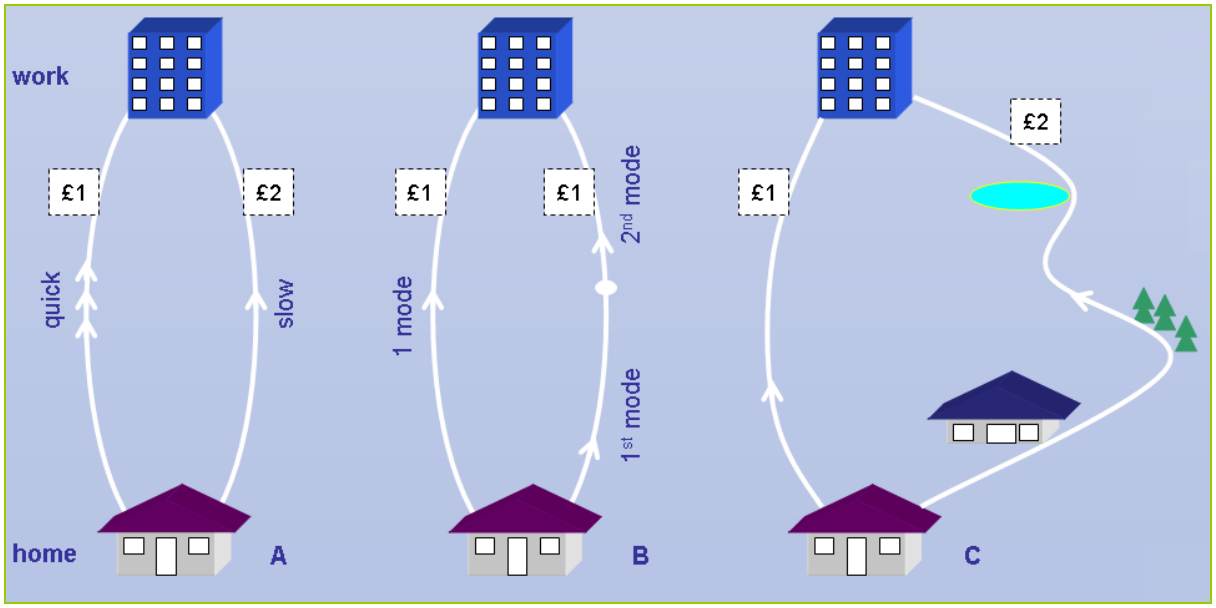

***Figure 2** – Examples of excess travel options*

The above definition was used to drive the questions in the sampling instrument used in this research as described below.

METHODOLOGY

The research focussed on commuting, so the first sampling task was to identify the working population in Tyne and Wear, UK. Tyne and Wear County is located in the North East of England, have five local authorities and the total population was over 1 million in 2001 (UK National Statistics 2001). When comparing the County with the whole England, there are some differences related to travel to work. Results presented in Table 3 show clearly that Tyne and Wear has much higher proportion of households with no car/van (41.8%) than England as a whole (26.8%) and more people is using public transport (21.1%). Tyne and Wear has good transport opportunities (including light metro system, buses, cars and ferries) and is a medium sized regional area where the concept of excess travel can be researched.

***Table 3** – Comparison of selected census 2001 data for England, Tyne and Wear*

Census 2001 question	England [%]	Tyne and Wear [%]
Households with no car/van [%]	26.8	41.8
Travel to work by car [%]	61	58.7
Travel to work by public transport [%]	14.9	21.2
Travel to work on foot [%]	10	9.6

Source: Census 2001

Two contrasting methods were used to select a sample in this first study as the intention was to identify which sampling methodology gave rise to the better source of data which would allow for later generalisation to the Tyne and Wear area. The first selection method was to choose individuals by their origin (home) even though the resident might travel outside Tyne and Wear for work. For this census 2001 data was used at the super output area level together with Geographical Information System analysis (GIS) to identify “hotspots” which met a number of criteria. The criteria, presented in Table 4, were that there should be high percentage of people travelling to work and low percentage of retired people and people working from home, good access to public transport and at least average for the region access to car. These criteria were implemented to maximise the number of people likely to commute and number of available modes of travel. Six SOAs in Tyne and Wear met these criteria best and one of them, Walkerville, was finally selected as it had the better bus and metro links with the city.

***Table 4** – Values of census 2001 attributes for final SOA*

Attribute	Min* [%]	Max* [%]	Final SOA [%]
Retired	2.0	36.2	17.1
Unemployed	0.7	15.7	2.8
Sick/disabled	1.3	23.6	5.8
Working at home	3.0	15.0	8.0
Working part-time	1.8	16.9	14.2

Attribute	Min* [%]	Max* [%]	Final SOA [%]
Working full-time	7.8	62.0	40.5
Student	1.0	62.8	3.8
0 car in HH	4.0	84.0	29.0
Travel to work – metro	0.0	25.0	5.0
Travel to work – bus	1.0	38.0	17.0
Travel to work – driving	21.0	74.0	52.0
Travel to work – passenger in a car	2.0	16.0	10.0

* min and max value of percentage for the attribute in census 2001 data
Source: Census 2001

The second selection method was to choose individuals by their destination (work) even though this might select employees living outside the Tyne and Wear area. The School of Geography, Politics and Sociology (GPS) at Newcastle University was selected as this School had a suitable number of employees at about 100 people but more importantly its location on the University campus guaranteed good transport links with the city. All staff, academic, clerical and other employees from the School were encouraged to take part in the survey so as to permit a wide variation in socio-economic characteristics.

The questionnaire design for the study was based on Redmond's et al. (Mokhtarian, Salomon, Ory) studies of the travel behaviour of residents of the San Francisco Bay Area, US and the outcomes (reports and papers) published between 1998-2005. The questionnaire had four main parts: daily travel behaviour, opinions/preferences, geographical data, and socio-economic data. In part two of the questionnaire, the main two questions included attitudinal statements and asked for importance of variables for respondents when choosing travel options. The variables describing attitude factors, used in Redmond's et al. study (Table 5), have helped in designing this section of the questionnaire. An adaptation process initiated some changes of terms and variables used to tailor the questionnaire to the British travel behaviour context. A number of statements describing travellers' preferences were included with a four point scale, from "not at all true" to "very true", to rate the respondents' answers.

Table 5 *- Attitude factors adapted from Redmond's et al. study*

Original attitude factors from Redmond's et al. study	Attitude factors adopted to Tyne and Wear study	Type
How often do you travel by a longer route to experience more of your surroundings? (1)	Sometimes I choose other route because I'm curious of the new route	Enjoyment
How often do you travel out of your way to see beautiful scenery? (1)	When I travel I have a chance to enjoy scenic beauty	
How often do you travel just to relax? (1)	A travel time is a good time to relax	
How often do you travel when you need time to think? (1)	A travel time is a good time to think	
How often do you travel to clear your head? (1)	A travel time is a good time to clear my head	

How often do you travel mainly to be alone? (1)	A travel time is a good way to be alone	
How often do you travel just for the fun of it? (3)	I like to travel more just for the fun	
It is common to use travel to temporarily escape obligations, routines, and/or tensions at home or work (3)	For me longer travel is an escape	
Under some circumstances, travel is desired for its own sake (5)	I like to travel for travel's sake	
I like exploring new places (2)	I like exploring new places	
Getting there is half the fun (2)	Getting there is half the fun	
My commute is a useful transition between home and work (2)	My trip is a useful transition between home and work/destination	
I like travelling alone (2)	I like travelling alone	
Travel time is generally wasted time (2)	I think my travel time is wasted	Negative
I use my commute time productively (2)	I think I could use my travel time more productively	
Travelling is boring (2)	I think travel is boring	
The only good thing about travelling is arriving at your destination (2)	The only good thing about travelling is arriving at your destination	
My commute is a real hassle (2)	My trip is a real hassle	
I am uncomfortable being around people I don't know when I travel (2)	I am uncomfortable being around people I don't know when I travel	
We need more public transportation, even if taxes have to pay for a lot of the costs (2)	We need more public transportation, even if taxes have to pay for a lot of the costs	Policy
To improve air quality, I am willing to pay a little more to use an electric or other clean-fuel vehicle (2)	I think about climate change/other environmental issues when making travel choices	
Travelling 'in style' (e.g. in a luxury car) can be a symbol of a desired socio-economic class or lifestyle (4)	I feel proud of owning a vehicle	

Source: 1 - Ory and Mokhtarian (2004), 2 - Redmond (2000; cited after Mokhtarian 2001), 3 - Ory and Mokhtarian (2005), 4 - Salomon and Mokhtarian (1998), 5 - Mokhtarian and Salomon (2001)

Other questions in part two of the questionnaire asked about importance of nine specific variables when choosing travel options and used five-point scale, from 1 – "not important" to 5 – "very important", to describe them. The variables included: good accessibility, good comfort, curiosity of new places, short distance, high independence (in travel), low price, good safety, short (travel) time and good enjoyment.

280 paper questionnaires were delivered to every second household (46%) in the Walkerville area in May 2008. According to census 2001 this area included 606 households, 1494 residents and 551 cars. In total, 63 questionnaires were returned giving an overall 22.5% response rate of which 45 full completed questionnaires (with postcodes of origin and destination points) were useful for analysis. At the same time a paper and on-line version of

the questionnaire was made available to the staff at the School of GPS: the total number of the questionnaires completed by employees was 42 (35 online and 7 hard copies) giving a response rate of approximately 45% (some staff are shared between different parts of the University and the exact number of staff is not known). 40 of the questionnaires were completed and useful. Overall, the analysis had access to over 100 completed questionnaires, but the final number of fully completed and useful questionnaires was 85 and included responses from 45 residents from Walkerville area and 40 from employees from the School of GPS. This two sampling methods were used to test which will be giving more representative results. In the future in the main survey one sampling method will be analysed and used for comparison with census data.

The responses given by the 85 individuals who provided usable questionnaires were analysed to build the picture of their travel behaviour and their associated socio-economic characteristics. Selected socio-economic characteristics of the two sub-samples were compared and these are presented in Table 6.

Table 6 *– Some characteristics of the sample*

Category	Option	Walkerville [% of total sample] n=45	School of GPS [% of total sample] n=40
Gender	male	16	14
	female	34	33
	no response	2	0
Age	23 or younger	2	2
	24-40	12	28
	41-64	36	16
	65-74	1	0
	75 and older	1	0
Marital Status	single (never married)	8	19
	married or re-married	38	26
	separated or divorced	7	2
Economic Activity	Higher and Lower Managerial and Professional	25	24
	Supervisor, production worker, skilled trade	5	1
	No response	1	1
	Clerical, retail staff	16	6
	Student	1	11
	Occupations not stated or inadequately described	5	5
Number of People Living in Household	1 person	4	7
	2 people	20	20
	3 people	15	12
	4 people	8	8
	5 or more people	6	0
Driving Licence	yes	42	38
	no	11	9

Number of Cars or Vans in Household	none	2	12
	1 car	31	22
	2 cars	18	11
	3 cars	2	2

Source: this study

Table 6 shows that nearly double the number of females over males took part in the survey. This fact will cause some bias in results, especially as other evidence (Pickett and Grey, 1996) suggests that there are a higher proportion of female users on public transport. Future research will challenge this problem and will suggest solutions how this can be reduced through changes in methodology used in the research.

Most of the survey respondents were aged between 24 and 64 years old (93%), married (64%) and working in higher or lower managerial positions (48%). The Walkerville sample in comparison with the University sample is much older and includes 69% of respondents (of total Walkerville sample) between 41 and 64 years old; second most common category of economic activity is represented by clerical staff workers (16%) and there is less households without cars (2%). Respondents from the School of GPS are younger (60% of respondents of total GPS sample are aged between 24 and 40), include more students (11%) and 12% of households are without cars. The characteristics of the Walkerville sample, close to those characteristics reported by the census 2001 data, confirm the efficiency of sample selection using the GIS method. Nevertheless, it should be noted that the census 2001 data collection took place at least 7 years before this data collection and for that reason some differences between self-reported results and figures from census 2001 might be expected.

ANALYSIS

For the analysis of excess travel, it was important to have home and work postcodes so as to identify alternative travel opportunities for the respondent. The analysis is based on 65 respondents who clearly identified these postcodes. With information on two different Public Transport Options (PTOs; options based on public transport services available on www.transportdirect.info) were compared with each Self Reported (SR) option in two ways. The first method was based on “pure” time and cost calculation, where self reported time and cost of travel from home to work was a start point for analysis. The second method used the generalised cost formula for VOT recommended by DfT, with sensitivity analysis undertaken with 13 different weighting options. These two methods identified some ETs and NETs and the characteristics of both groups are presented later in this section. PTOs only were considered as there was no direct question in the survey instrument asking about car availability to respondents.

In the pure time and cost method, four variables were considered: time, distance, cost and effort. The SR times and costs of travel were compared with times and costs of two PTOs for the same origin-destination pairs. The prices for the PTO options were cost on the basis of an annual and daily ticket being available for travel. In the second method a generalised cost definition was used to compare SR travel and the two proposed PTO. This was based on the methodology recommended by the UK Department for Transport (www.webtag.org.uk) for travel by public transport and used the following formula:

$$G_{PT} = V_{WK} \cdot A + V_{WT} \cdot W + T + \frac{F}{VOT} + I$$

Equation 1 – Generalised cost formula

Where G_{PT} is the general cost for public transport, A is the total walking time to and from the service, W is the total waiting time for all services used on the journey, T is time spent on the service (bus, train), F is the fare and I is the interchange penalty. V_{wk} and V_{wt} are weights for walking and waiting. VOT is a value of time for a specific transport mode, but here was used only one VOT for non-working time equal to £5.04/h. For sensitivity analysis, thirteen different options for weights for walking time (1.5-2.0), waiting time (1.5-2.5) and interchange penalty (5-10 mins) were used.

These two methods understandably give different results. In the pure time and cost strategy the number of respondents who showed an excess in time of travel only was 15. When considering costs only, there were 32 travellers when the cost was compared with daily travel using an annual ticket and 22 individuals when the cost was compared with a daily ticket. But the definition of excess travel requires that cost or time alone is not sufficient and that excess on both is required giving a final number of ETs for this method between 5 and 6 respondents. Using the generalised cost method, the number of respondents considered to be undertaking excess travel declined as the values of weights increased. When walking and waiting times were unweighted and there was no for interchange penalty the maximum ETs were observed at 16 (24% of the sample) but when the weights were increased to weighting walking time by 2, waiting time by 2.5 and a 10 minute interchange penalty (figures indicated by the public transport literature), the number of ETs fell to 2 (3% of the sample). The two above methodologies for ET identification suggest that the identification of these travellers is critically dependent on the criteria used. The generalised cost methodology is closer to the new definition discussed above in the way it weights the different elements of the journey and by including an interchange penalty gives some weight to ”effort”. The number of ETs are small but this is not surprising as the journey to work is most likely to be the best researched by travellers wishing to minimise the disutility associated with travelling.

The questionnaire instrument sought respondent’s opinions and preferences relating to travel to work and non-work travel (part two of the questionnaire) as described above. Table 7 presents attitudes towards 9 features influencing commute options. The differences between ETs and NETs are small, but they exist. The ETs’ values of good accessibility and curiosity of new places are statistically significantly different at the 5% level from the NETs and low price, good comfort and high independence have the same value for both groups. There are also apparent qualitative differences between the means of other features which are not statistically significantly different, probably due to the small sample size of ETs, which need to be explored in a larger sample. In particular it appears ETs find good accessibility and the curiosity of new places as important factors in making their commuting decision in contrast to NETs. Short distance, good safety and good enjoyment, are not so important for ETs.

***Table 7** - Attitudes towards factors influencing travel to work options and mean values (scale: 1 - not important, 5 - very important)*

Importance of factors when choosing travel to work	ETs (n=9)	NETs (n=56)	p-value (2 tailed) for difference of means
good accessibility	4.67	4.13	.079*
good comfort	3.78	3.55	.582
curiosity of new places	3.00	1.89	.073*
short distance	3.00	3.70	.142
high independence	3.89	4.00	.809
low price	3.78	4.00	.677
good safety	3.89	4.41	.320
short time	4.00	4.33	.319
good enjoyment	3.00	3.55	.237

*significant at the 10% level
Source: this study

In general ETs feel more negative about the travel to work than the NETs. ETs claim not commute for travel's sake and they do not agree that travel to work is a good time to relax and as a consequence they describe commuting as wasted time (2.56 points), boring (2.67 points) and a real hassle (2.44 points). This result is particularly interesting in the light of these commuters having an alternative which would reduce their travel "cost". These results are presented in Table 8. ETs responses on the attitudinal questions are statistically different from NETs on their attitude towards public transport and finding a quicker and cheaper way to travel, the relaxing and environmental impact of travel and travel for travel's sake at a 5% level of significance. ETs are not as worried about the climate change or the environment when commuting as the NETs. It is particularly interesting that ETs have a higher mean score (3.50 points) on the attitude "If I could find quicker and cheaper way I would use it" which suggests that not all the ETs are ETs by choice.

***Table 8** – Statements characterising travel to work and mean values (scale: 1 – not at all true, 2 – not very true, 3 – fairly true, 4 – very true)*

Statement	ETs (n=9)	NETs (n=56)	p-value (2 tailed) for difference of means
Sometimes I choose other route because I'm curious of the new route	1.67	1.54	.678
When I travel I have a chance to enjoy scenic beauty	1.78	1.91	.738
A travel time is a good time to relax	1.78	2.52	.032*
A travel time is a good time to think	3.22	3.13	.697

A travel time is a good time to clear my head	3.00	2.95	.865
A travel time is a good way to be alone	2.56	2.75	.551
I like to travel more just for the fun	1.33	1.57	.232
For me longer travel is an escape	1.44	1.66	.556
I like to travel for travel's sake	1.00	1.43	.040*
I like exploring new places	2.11	2.16	.897
Getting there is half the fun	1.56	1.68	.653
My trip is a useful transition between home and work/destination	2.44	2.79	.451
I like travelling alone	2.56	2.51	.900
I think my travel time is wasted	2.56	2.11	.187
I think I could use my travel time more productively	2.11	2.13	.974
I think travel is boring	2.67	2.21	.231
When I'm travelling every day is the same	2.44	2.68	.530
The only good thing about travelling is arriving at your destination	2.44	2.57	.757
My trip is a real hassle	2.44	1.86	.128
I am uncomfortable being around people I don't know when I travel	1.56	1.89	.244
We need more public transportation, even if taxes have to pay for a lot of the costs	3.22	2.75	.154
I think about climate change/other environmental issues when making travel choices	1.78	2.66	.015*
If I could find quicker and cheaper way I would use it	3.50	3.00	.126

*significant at the 5% level
Source: this study

Factor analysis is a multivariate technique for identifying whether the correlations between a set of observed variables stem from their relationship to one or more latent variables, which cannot be directly measured but is assumed to be related to one or more variables that can be measured in the data (Field, 2009). Table 9 shows factors for travel options and preferences related to travel perceptions identified in factor analysis.

***Table 9** – Statements and factors selected in factor analysis*

Questions	Statements	Factors
Travel options	Good Enjoyment	Factor 1: Enjoyment of travel
	Good Safety	
	Good Comfort	
	High Independence	
	Low Price	
	Good Accessibility	
	Short Distance	Factor 2: Dimensions
	Short Time	

	Curiosity of New Places	of travel
Preferences related to travel perceptions	I like to travel more just for the fun	Factor 1: Enjoyment of travel
	For me longer travel is an escape	
	I like to travel for travel's sake	
	I like exploring new places	
	Sometimes I choose other route because I'm curious of the new route	
	Getting there is half the fun	
	When I travel I have a chance to enjoy scenic beauty	
	I think about climate change/other environmental issues when making travel choices	
	We need more public transportation, even if taxes have to pay for a lot of the costs	
	I think I could use my travel time more productively	Factor 2: The negative side of travel
	I think my travel time is wasted	
	My trip is a real hassle	
	I think travel is boring	
	When I'm travelling every day is the same	
	A travel time is a good way to be alone	Factor 3: Travel as a transition
	A travel time is a good time to think	
	A travel time is a good time to clear my head	
	My trip is a useful transition between home and work/destination	
	I like travelling alone	
	A travel time is a good time to relax	
	I am uncomfortable being around people I don't know when I travel	Factor 4: Discomfort of public travel
	If I could find quicker and cheaper way I would use it	Factor 5: Disutility of travel
	The only good thing about travelling is arriving at your destination	

Source: this study

Since some of these statements or factors in Table 10 could be argued to measure similar dimensions or characteristics, factor analyses were conducted to reduce the data into a set of factors. In the combined method, where "pure time and cost" ETs were added to "generalised cost" ETs, a total of 9 ETs emerged. The results for mean values of factors, extracted after implementing factor analysis method, are presented below in Table 10.

***Table 10** – Average values of factors for ETs and NETs when using combined method*

Questions	Type of travel	Factors	ETs (n=9)	NETs (n=56)
Travel options	Travel to work	Enjoyment of travel	-.156	.010
		Dimensions of travel	-.089	-.474
	Non-work travel	Enjoyment of travel	.256	.304

		Dimensions of travel	.146	.395
Preferences related to travel perceptions	Travel to work	Enjoyment of travel	-.721	-.552
		The negative side of travel	.332	.150
		Travel as a transition	.050	.402
		Discomfort of public travel	-.003	.026
		Disutility of travel	-.659	.038
	Non-work travel	Enjoyment of travel	.379	.662
		The negative side of travel	.140	-.192
		Travel as a transition	-.499	-.178
		Discomfort of public travel	-.624	.172
		Disutility of travel	-.410	-.115

Source: this study

For ETs and NETs the “enjoyment of travel” is more important when choosing non-work travel options than when commuting and this fits in with what might be expected. For the “dimensions of travel”, the reverse is true with this factor being more important when travelling to work than when doing non-work travel.
When considering the factors relating to travel perceptions, Table 10 shows that these are very different for ETs and NETs for all factors except the factor called “enjoyment of travel”. In all other cases scores for ETs and NETs were very different. “Travel as a transition” was highlighted by both ETs (.050) and NETs (.402) when commuting, but less important when doing non-work related travel (-.499 and -.178 respectively). “Discomfort of public travel” had higher scores for NETs than ETs in both types of travel. ETs scored much higher on “disutility of travel” (-.659, -.410) than NETs (.038, -.115) suggesting that, firstly ETs believe that if they could find quicker and cheaper ways of transport they would use them and secondly, they believe the only good thing about travelling is arriving at your destination.

CONCLUSIONS

Excess travel in the literature has a long history but definitions of the phenomenon (in the context of leisure and commuting) vary. This paper links to the new definition of excess travel which builds on the previous research.
Sample selection using the census and GIS to identify ”hotspots” was more efficient at identifying a sample with the desired attributes and an improvement over the use of destination base data as it is easier to control for the socio-economic profile of the sample. Two methodologies were explored to identify excess travellers: pure time and cost and generalised cost. Whilst the generalised cost method, through the weighting process, captures some of the “effort” required by the new definition, there is a need to find a way to more explicitly incorporate “effort”. Nevertheless, the research identifies a small proportion of commuters as excess travellers. As excess travelling in the daily commute is likely to be least prevalent (it is much more understandable that leisure travel might generate some utility), this is an important result. Significantly, there were statistically significant differences in the role of good accessibility for ETs’ in their travel to work options and in differences between ETs and NETs in their attitudes to travel.

Whilst the sample of respondents in this study is small, the next step of this larger project will be to confront pilot study results with a larger sample. This paper contributes by testing new methods and analysis and confirms that excess travelling exists in the commute to work. The paper also continues a stream of understanding the differences between ETs and NETs in terms of the factors and perceptions important for their travel. This study has a potential to explore policy of encouraging sustainable transport patterns of commuting by understanding ETs better, describing who they are and why and how they behave in their daily travel to work. That knowledge, in the future, could possibly allow developing new marketing strategies promoting excess travel time as an activity time and finally, and probably most importantly for PTPs, as a way of creating extra revenue for them.

In the future the concept of excess travel could be extended to travel cost analysis seen from environmental angle, where there is stronger evidence and expectation of this type of phenomenon to be researched.

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