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Understanding attitudes towards public transport and private car: A qualitative study

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Abstract

This paper presents the results of a qualitative study of public transport users and car users in order to obtain a deeper understanding of travellers' attitudes towards transport and to explore perceptions of public transport service quality. The key findings indicate that in order to increase public transport usage, the service should be designed in a way that accommodates the levels of service required by customers and by doing so, attract potential users. Furthermore, the choice of transport is influenced by several factors, such as individual characteristics and lifestyle, the type of journey, the perceived service performance of each transport mode and situational variables. This suggests the need for segmentation taking into account travel attitudes and behaviours. Policies which aim to influence car usage should be targeted at the market segments that are most motivated to change and willing to reduce frequency of car use.

Keywords: Service quality; Travel attitudes; Public transport; Private car; Qualitative research; Portugal.

1. Introduction

In the last decades the levels of mobility have increased substantially in all European countries (MOTIF, 1998). This raises concern about increasing car use and the implications of this in terms of congestion and pollution. Another important feature to be considered in decision-making concerning transport is the current and changing nature of society and lifestyle patterns which generate diversified travel needs. Most people are now highly dependent on car travel (Anable, 2005). But, the car is far more than just a means of transport (Steg, 2005). Other motives than just its instrumental functions seem to play an important role, such as feelings of sensation, power, freedom, status and superiority (Steg, 2005). Moreover, the perceived benefits of cars depend on the lifestyle and social–spacial relations engaged by the user (Hiscock et al., 2002). Some evidence has suggested that some people may not always drive out of necessity, but also by choice (Handy et al., 2005). So it is necessary to promote policies that can reduce private transport dependence as well as the need for driving, by providing alternatives to driving. Such policies might involve an improvement in the public transport service and promoting a shift to slower modes such as cycling or walking. Furthermore, it is necessary to promote measures to reduce the attractiveness of car use (Gärling and Schuitema, 2007).

Yet it is not expected that the public transport system would be able to provide a level of service with sufficient appeal to attract large numbers of car users to switch to public transport (Hensher, 1998). Policies which aim at increasing public transport usage should promote its image, but at the same time, public transport systems need to become more market-oriented and competitive. This requires an improvement in service quality, which can only be achieved by a clear understanding of travel behaviour and consumer needs and expectations. Therefore, it becomes essential to measure the level of service in order to identify the potential strengths and weaknesses of public systems. This can provide clues to public transport management in the process of evaluating alternative service improvements aimed at enhancing user satisfaction and increasing market share. However, developing accurate and valid measures of service quality is a complex task, since it deals with perceptions and attitudes. Hence, gaining

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a better understanding of consumers' perceptions of the quality of the service provided by public transport is important.

This paper presents data from a qualitative study involving public transport users and car users. The research questions addressed in this study are: What are the main influences affecting people's choice of travel mode? What are the attitudes towards transport? How public transport services are perceived and evaluated? To explore these questions, a series of in-depth interviews were conducted in the region of Porto, Portugal.

The metropolitan area of Porto, the second largest metropolitan area in Portugal, faces an increase in car use, like many other big metropolitan areas. In a 10-year period, from 1991 to 2001, car journeys to work or school raised from 23% to almost 50% (INE, 2003). Buses are the most used form of public transport, but the demand tends to decrease. A new mode of transport, light rail, is being constructed in the metropolitan area. Light rail, which started its operation in 2003, offered only two lines at the time this study was carried out, but more are still under construction.

2. Literature review

Understanding travel behaviour and the reasons for choosing one mode of transport over another is an essential issue. However, travel behaviour is complex. For each journey, people have the choice between different transport modes, each one having specific characteristics, advantages and disadvantages, and costs. Additionally the choice of one specific transport mode can vary over time and with the type of journey. Thus, there are many people that use both public transport and private cars. So, in order to reduce car use it is necessary to understand the underlying patterns of travel behaviour. In general, the car is the most attractive mode of transport. Convenience, speed, comfort and individual freedom are well-known arguments (Anable, 2005; Hagman, 2003; Jensen, 1999). This means that public transport needs to adjust the service to the attributes required by consumers in order to become more attractive and influence a modal shift (STIMULUS, 1999). Service quality is perceived as an important determinant of users' travel demand (Prioni and Hensher, 2000).

Yet the measurement of service quality remains a challenging and important research area with practical implications for service providers (Hensher et al., 2003). Considering public transport, both operators and authorities need to understand how consumers evaluate the quality of the service. However, consumer evaluation of quality is an abstract and elusive concept to measure (Parasuraman et al., 1985), complicating the development of valid and accurate constructs of service quality. It deals with abstract and intangible attributes, such as safety and comfort, which are not easily measured.

From the service providers' perspective it is essential to identify the most important attributes of service quality that are perceived by current and potential users. However, the specification of a set of relevant attributes is complex (Prioni and Hensher, 2000). In addition, it is important to identify their relative importance to users' satisfaction. For instance, research has shown that reliability (being on time) is a decisive factor (Bates et al., 2001; Edvardsson, 1998; Hensher et al., 2003; König, 2002). The problem is not so much having to wait, but the uncertainty of when the transport will arrive (König, 2002). Likewise attributes like frequency (Hensher et al., 2003) and comfort (Friman and Gärling, 2001; Hensher et al., 2003) are also highly valued by consumers, being key elements of consumer satisfaction. Other attributes found as having a major negative impact on consumer satisfaction are travel time and fare level (Hensher et al., 2003).

Although those attributes are usually considered very important, others may also have a positive effect on satisfaction and can represent great potential for improvement. For instance, service providers should make available clear and simple information (Edvardsson, 1998; Friman and Gärling, 2001). Likewise, the driver assumes an important role in consumer contact (Edvardsson, 1998; Friman and Gärling, 2001). Aspects related to vehicle conditions (for instance, cleanliness) are also meaningful to users (Swanson et al., 1997).

It is important to understand that different user segments evaluate the same service quality area differently and their satisfaction will be influenced by different service attributes (Andreassen, 1995). Also, the needs, beliefs and expectations of users will vary significantly between different segments of the market (Anable, 2005; Jensen, 1999; QUATTRO, 1998).

Usually the market is segmented according to socio-demographic variables and transport use (car users and public transport users). However, it seems that few differences exist when only socio-demographic segmentation are taken into consideration (Anable, 2005), or when groups are segmented according to transport use (STIMULUS, 1999). This indicates the need for carefully identifying new segments of users according to the underlying psychological constraints, incorporating perceptions and attitudes. Several studies, using different approaches and techniques have made interesting advances in travel market segmentation (Anable, 2005; Jensen, 1999; Outwater et al., 2003; STIMULUS, 1999).

Also, it is known that travel behaviour is influenced by the service level of the transport system. However, this dependence is not directly related to the objective service level, but is influenced by psychological factors (Fujii and Kitamura, 2003). Psychological factors include perceptions, attitudes and habits (Ajzen, 1991; Fujii and Kitamura, 2003). So, changing the psychological factors may also change travel mode choice, although the level of service remains the same (Fujii and Kitamura, 2003).

Hence, to attract more users to the public transport system it is important to know more about the psychological factors that influence mode choice and the measures needed

to reduce car dependence. A way to enhance that knowledge is through qualitative methods which can provide valuable insights into people's attitudes and perceptions towards transport. For example, Guiver (2007) conducted focus groups to discuss bus and car travel, finding that the respondents used different criteria to evaluate each mode, and viewed them differently depending on whether they were users or non-users. When talking about bus travel, respondents focused on worst-case scenarios; however, these were not used to describe car travel.

Hagman (2003) studied car users and explored how they perceived the advantages and disadvantages of car use. His research showed that advantages and disadvantages are presented differently. Advantages, such as freedom, flexibility and saving time are always personal and a result of personal experience, as are some of the disadvantages such as costs. However, disadvantages concerning environmental impacts are usually presented with references to public discourse. An important aspect of this research is that although respondents seem to agree that car use in general ought to be reduced due to environmental issues, they do not think of reducing their own car use. Gardner and Abraham (2007) conducted semi-structured interviews to ascertain the reasons for driving to work and identified five core motives: journey time concerns, journey based affect, effort minimization, personal space concerns and monetary costs. However, the underlying desire for control underpinned many of these motives.

Jensen (1999) conducted 30 in-depth interviews and identified six mobility types based on behaviour and attitudes: the passionate car drivers, the daily life car drivers, the leisure time car drivers, the cyclists/public transport users of heart, the cyclists/public transport users of convenience and the cyclists/public transport users of necessity. This study points out that one strategy alone is not sufficient to change the transport behaviour of the population in general. Also, she stated that the expansion and improvement of the public transport system is not going to make car users in general change from driving a car to using public transport.

3. Methodology

Because travel behaviour is complex, a deep understanding of people's perceptions, attitudes and behaviour is needed. Qualitative methods are a powerful tool to explore those complexities (Clifton and Handy, 2001), since they allow a grasp of the individual's own explanations of behaviour and attitudes. One of the major trade-offs between quantitative methods and qualitative methods is a trade-off between breadth and depth (Patton, 1990). Quantitative approaches have the advantage of measuring the reactions of many subjects to a limited set of questions allowing the comparison and statistical aggregation of the data. On the other hand, qualitative methods produce a wealth of detailed data on a small number of individuals (Patton, 1990).

In the travel decision-making process emotions play a role as important as rationality and qualitative research allows the exploration of emotions and the "ifs, buts and maybes" of life without the constraints of quantitative methods (Grosvenor, 2000). Qualitative methods have the advantage of allowing people to express what is really important to them in their own words. Most of the research conducted on mode choices employs researcher-selected variables, so tends to focus on just a few attributes. In this regard, qualitative methods can be a valuable way to allow respondents to specify which factors are important to them. Research on travel behaviour using qualitative methods has provided new insights into this field, allowing a better understanding of transportation problems (Clifton and Handy, 2001).

This study was based on 24 in-depth interviews with the general public, including regular and occasional users of public transport and car users. These qualitative procedures enable us to gain insight into the underlying customer evaluations and attitudes towards transport. It should be noted that the sample is relatively small, thus the results should not be generalized.

3.1. Sample design and participant selection procedures

The sample was stratified to ensure a balance of public transport users and car users, taking into account a mix of ages from 18 to 70 and a similar number of male and female participants. In addition, the participants had to live in different geographical locations in the metropolitan area of Porto, since available transport alternatives and constraints differ according to the place of residence.

Based on transport usage, three groups were defined a priori:

(1) *Public transport users*: those who regularly use public transport for most of their usual journeys (7 participants).
(2) *Car users*: those who always use private cars for all of their journeys (10 participants).
(3) *Both*: those who use private cars and occasionally use public transport for their usual journeys (7 participants).

The in-depth interviews were held in Porto. The selection of participants was undertaken in a public place called "Citizen Store", which is a one-stop-shop where several public services are grouped and has a broad influx of the population from the whole metropolitan area. The participants were approached by identified staff from the public transport operator supporting this study, who explained the purpose and sponsors of the research. After some initial qualifying questions, each person was then asked to participate in the study. The interviews were conducted in the public transport operator office, which is located next to "Citizen Store". This procedure was implemented to overcome some difficulties found in the scheduling process, particularly to avoid drop outs.

Table 1
Age range of the respondents

Age group	Public transport user		Car user		Both		Total
	Male	Female	Male	Female	Male	Female	
18–29		1	2	2		2	7
30–39	2		2	2	1	2	9
40–49		2		1	1		4
50–59	1			1		1	3
60–70	1						1
Total	4	3	4	6	2	5	24

In this study, 24 in-depth interviews were conducted with the general public, divided into three groups, as described above. There were slightly more females (14) than males (10) in the sample. The respondents' age ranged from 21 to 69, with an emphasis on younger respondents (see Table 1).

Most of the participants (18) were full-time workers and a further three were students, two were retired and only one was unemployed. All levels of education, from elementary school to college graduates, were represented in the sample, 54% having at least some college education.

Only two participants did not have a driver's license, and three did not have access to a car. Most of the respondents (75%) lived in households that owned two or more cars. The sample had a higher number of participants living in Porto (10), and the remaining participants lived around the metropolitan area.

The journey to work or school was the regular ride described by 22 respondents, five of whom travelled by public transport while 11 travelled by car. Three respondents used either public transport or car, two used both and only one went by foot. The main mode of public transport used by the respondents was the bus.

3.2. Interviewing procedures and analysis

The interviews were semi-structured, based on a predefined interview guide, and took 30 min on average. The focus was on the process of mode choice for the most regular journey, and on the influences affecting that choice. Through the interviews attitudes towards transport were explored, as well as how people could be attracted to public transport. Another issue covered was the participants' overall perceptions of public transport services and their evaluation of different modes. The interviews particularly addressed the use of bus and private car, since they are the two major choices of transport in the metropolitan area under study. Additionally, to investigate the attitude toward light rail, which is a new mode of transport and not yet fully operational, participants were asked to state the strengths and weakness of light rail when compared to bus service and what mode they would prefer if light rail was available to them.

In order to gain more background information on the participants, they were asked to complete a questionnaire at the end of the session, which included some socio-demographic data, such as age, income, occupation, household characteristics, car ownership and driving licence.

The in-depth interviews were digitally recorded and fully transcribed. The qualitative data analysis software NVivo (2.0) was used to facilitate the organization and structuring of the process of coding and categorization and the development of relationships among concepts.

This qualitative study was based on a "grounded theory" approach (Glaser and Strauss, 1967), which provided an interactive framework for data analysis. The data were initially coded into concepts and ideas emerging from the data and the literature review. This analytical process was further iteratively refined throughout a systematic comparison between the data and the concepts and patterns previously identified (Strauss and Corbin, 1998). This process allows the theory to emerge from the data in order to gain more insight and enhance understanding of the phenomenon under study. In the first stage the interview texts were analysed line by line, and pertinent excerpts were assigned provisional conceptual codes. The next stage involved the search for relationships between conceptual labels and categories. The goal was to systematically develop and relate categories. In the final stage, categories were integrated and refined (Strauss and Corbin, 1998).

Data analysis was structured around factors reflecting both utilitarian and emotional needs positively and negatively influencing the choice of transport, since the combinations of those factors would constrain people's behaviour.

4. Results

The interviewees were asked to talk about the different modes of transport, even if they did not use them, with a focus on bus and private car, as previously mentioned. This allowed for a comparative evaluation between modes and the perceived advantages and disadvantages of each one. Additionally, asking non-users their perceptions' about public transport is important in understanding the reasons for non-use; how they would feel if they had to use public transport; and also what would make them switch to alternative modes.

The results showed that the choice of transport is influenced by several factors such as the individual's characteristics and lifestyle, the type of journey, the perceived service performance of each transport mode and situational variables.

4.1. Respondents' evaluations of public transport

The advantages and disadvantages of public transport and private car, most indicated by the participants, are presented in Table 2.

Table 2
Perceived advantages and disadvantages of buses and private car

Advantages	Disadvantages
Public transport	
Cost	Waste of time
Less stress	Too crowded
No need to drive	Lack of comfort
Be able to relax	Time uncertainty
Be able to rest or read	Lack of control
Travel time on bus lanes	Unreliability
Less pollution	Long waiting times
Talk to other persons on the vehicle	Need of transfers
	Traffic
	Lack of flexibility
	Long walking time
Private car	
Freedom/ independence	Cost
Ability to go where I want	Difficulty of parking
Convenience	Cost of parking
Rapidity	Stress of driving
Comfort	Traffic
Flexibility	Waste of time in rush-hour traffic
Know what I can expect	Pollution
Safety	Accidents
Having my own private space	Isolation
Listen to music	

4.1.1. Travel time

Travel time is simultaneously considered an advantage and disadvantage of buses and is an important reason for mode choice. In areas with exclusive bus lanes, and to travel to the city centre, the bus is considered faster than the car, mostly by public transport users. As a female, 43-year-old, public transport user said:

> I refuse to go downtown by car! I just refuse to go, because it is despairing having to park the car, and it takes too long and the continuous stop and go.

But for journeys across the metropolitan region or in areas with heavy traffic during rush-hour, using public transport is perceived as a waste of time by almost all car users and occasionally public transport users. This also includes the waiting time, which is perceived as too long, and a barrier to public transport use. A key aspect for these participants is the lack of control due to the uncertainty of when the bus will arrive and the perception that public transport is unreliable. Hence, they feel that if they use public transport, they will not be able to meet their schedules:

> [waiting] is very annoying, because I don't have anything to do, and having to be there… (female, aged 21, occasional public transport user, car owner).
>
> Not knowing what to expect is the thing that worries me the most. Note that even with all the shortcomings of the private car, I know that I leave home, I drive my car, get a place to park and walk a little, but I get there. I know I only depend on me! But with public transport no, I never know, it is very difficult to get to my destination (male, aged 43, occasional public transport user, car owner).

4.1.2. Cost

Public transport is acknowledged as cheaper than car even by car users, but it does not appear as a key factor for changing to public transport, when considered in isolation from other factors which restrict that choice. Some car users recognize that if they used public transport they would save money:

> In fact car is much more expensive (male, aged 43, occasional public transport user, car owner).
>
> When talking about costs that [using public transport] would be much cheaper to me (female, aged 39, car user).

But for public transport users with lower incomes, travel cost is very important. Yet none of the respondents complain about the cost of bus travel. A female, aged 41, non-car owner, user of public transport explained:

> I do not have many possessions and the car is a bigger expense, while the bus pass is thirty and some euros, the car is a bigger expense.

4.1.3. Not having to drive and opportunity to relax and socialize in bus travel

The stress of driving associated with traffic congestion is, for some respondents, a problem and a motivating factor for using public transport. For them the time spent on public transport was an opportunity to relax and read a book or newspaper. However, these perceived advantages must be connected with comfort related attributes such as having a seat on the bus and a pleasant temperature. Some car users, particularly women, would prefer to use public transport just for the freedom from driving responsibilities that allows one to relax, but they think that using public transport is not a viable alternative to them:

> I have to drive to work and when I get there I am nervous due to traffic jams (female, aged 39, car user).
>
> I am sick of having to face traffic in the morning, it tires me. It would be much more relaxing coming to work by public transport and not having to be worried about traffic jams…If I had a public transport I could use, it would be much more relaxing for me… It's much more relaxing, being on the bus, to be able to take a book and read is much more pleasant than having to drive and pay attention (female, aged 33, car user).

Using public transport for some of the respondents is also seen as an opportunity to talk to other people on the bus or meet their colleagues who also take the same bus, it "is a time to have fun and laugh".

4.1.4. Comfort

As mentioned above, having a comfortable journey is very important for all the respondents. Comfort means soft clean seats, a pleasant temperature, preferably having air-conditioning and not many people on the vehicle. This aspect is evaluated differently across different groups. Generally, regular public transport users think that the new buses with air-conditioning and lower floor are "very good and very comfortable". But the number of people in the vehicle at peak hours is a problem. On the other hand, car users and occasional public transport users usually see buses as uncomfortable, too crowded, smelly and airless. A female, aged 22 and occasional bus user said:

> It was too hot, a lot of people inside the bus, I couldn't even sit down, and the bus was stopping and going, stopping and going…when I arrived at work I was tired…

4.1.5. Lack of information

Several respondents, especially occasional public transport users and car users, mentioned not having enough information regarding the bus routes and timetables; and thinking that the bus system is difficult to use and information is difficult to access.

> For me it's very confusing [using buses]! But when I need I ask someone what I need to know: what bus I should catch, where it stops and so on (female, aged 21, occasional bus user and car owner).
> I don't know what bus I should catch [if she had to use a bus]! I think I should be better informed (female, aged 56, car user).
> The bus stop should have more information and also inside the bus, so people can guide themselves (female, aged 33, car user).

Among bus users the main problem occurred when the bus company changed timetables or routes and did not provide enough information to users. The lack of explanations from the bus company of why changes were made and bus users not being informed in advance made them very upset and unsatisfied with the bus service.

> They should have provided more information. I usually see the papers everyday and didn't see anything [about ending a bus route], and then I get to the bus stop, and that bus disappeared! The bus doesn't stop there anymore (male, aged 31, bus user).

4.1.6. Differences in bus performance evaluation

Public transport performance evaluation was not the same across the different user groups. Public transport users generally made more positive evaluations of the bus service than non-users. They claim to be satisfied and that they like to travel by bus. Although, when talking about aspects like the number of people on the bus, being on-time, and waiting time, public transport users were also dissatisfied. They also think that buses should be more frequent and the hours of service increased, especially at night. Several car users think that the "public transport offered to them do not have enough quality" and that the service "does not satisfy". Car users feel that public transport is unreliable, not frequent enough, uncomfortable, overcrowded and the ride is not smooth and safe from accidents. These strong negative reactions seemed to often arise from previous experiences with public transport and the opinions of family and friends causing negative word-of-mouth, which appear to discourage subsequent use. For car users service quality means:

> It's being at point A and being able to get to point B comfortably and fast, and by doing so satisfying my needs. I am here and have the need to get somewhere and I have transport that is comfortable and puts me at my destination at an acceptable time. Wonderful! (male, aged 43, occasional public transport user, car owner).
> Being transported as good as if I go in mine [car] (female, aged 47, car user).

4.1.7. Light rail vs. bus

Light rail is perceived as more reliable, comfortable, frequent, faster and spacious than bus service. Other intangible attributes also emerged, such as being less stressful and tiresome, new, attractive, funny, convenient and easy to use. Light rail is also described as the "ideal service" and for a respondent (male, aged 43, occasional public transport user) will "beat without any doubt all other transports". It is interesting to note that car users generally made more positive evaluations of light rail than public transport users. Though public transport users pointed out that the cost of light rail service was higher than that of the bus.

Not all the respondents have used light rail because it was not yet available in their area, but some have tried it just for fun. The attitude towards light rail is highly favourable, because it is perceived to offer a higher service quality in comparison with bus services, especially in terms of reliability and frequency:

> The Light Rail! Light Rail! [Referring to the ideal transport] I have recently commented on it, it's the most attractive to me, because it's silent, fast and much more efficient! (…) For me the light rail is much more advantageous (male, aged 30, car user).
> I really liked it [Light rail]! I think light rail is a more funny transport, I don't know why (female, aged 56, car user).
> Light rail is definitely better [than bus], it is preferable!…Light rail would be ideal, mainly because of lack of traffic and waiting times. It's a fast service (female, aged 23, car user).

Some of the car users are "anxious" that light rail become available in their area of residence. They stated that they would probably use light rail instead of the car for their usual journeys, when it is available.

> I suppose [light rail] is an excellent alternative (male, aged 44, car user).

My dream is having light rail available [in my neighbour] (male, aged 34, car user).

Although this expresses an intention, it is not certain that this would result in actual behaviour because other constraints may overcome this intention.

4.2. Respondents' evaluations of private car

4.2.1. Travel time

The car was seen as a way to achieve greater freedom and flexibility and overcome the problems and constraints associated with public transport usage. A key factor in respondents' choice of the car for the journey to work is the time taken by public transport when compared to the time taken by car. As a female, car user (aged 54), who only uses public transport to get to work when the car is not available, explained:

On those days [when she has to use public transport to work] it is a problem! If I use public transport I won't get to work on time, or I would have to leave home very early, I have to wait 20, 25 minutes…I hate the journey!

4.2.2. Attachment to cars

Some car users, interviewed in this study, have a strong attachment to their car and it would be very difficult to attract them to the public transport system. They have no intention to ever stop using their car and usually have a very a strong feeling against public transport. They care for their car and love to drive it:

I love my truck (female, aged 47, car user).

I love driving my car (male, aged 30, car user).

4.2.3. Dependence on cars

Some respondents feel that it would be very difficult to live without a car. For them the car is seen as essential, because they feel that there are no viable alternatives and only the car allows them to have the lifestyle they aspire.

I take my car everywhere (female, aged 21, car user).

The public transport service offered to me doesn't have enough quality when compared to the car. To have the same lifestyle… (female, aged 23, car user).

4.2.4. Car convenience and flexibility

One of the car's main advantages perceived by the respondents is convenience, which was very important to most of the respondents. As a 47-year-old woman and car user said "the car is right there at my door, I just take it and go". The car gives the perception of freedom, of being more in control and being able to keep their personal timetable and thus enhance autonomy:

I think it is unique; we are in our car and suddenly have an idea to go somewhere else and just go (female, aged 56, car user).

The car gives freedom, people can go wherever they want, and if they don't want, just don't go (male, aged 31, public transport user, car owner).

Car users think of the car as easier to use: "it's there and I want to go there and quickly I take the car and go anywhere". Also as a male, aged 31, said: "the car is always more comfortable, we can listen to the radio, it's our own space, it has that advantage".

Although traffic is also a problem, some car users feel that they can change route and avoid traffic. Furthermore, they feel that congestion also affects buses so they are better of driving and choosing alternative routes:

Traffic congestion bothers, but it also bothers on the bus, having traffic jams and between going by bus or car… I prefer the car, I am alone, listening to the music I want, with the temperature I want, with the smell I want, and not having to be around other people smells (female, aged 36, car user).

4.2.5. Car status

Respondents with low income who had many difficulties in buying a car are not likely to stop using it, mainly because having a car is such an important achievement to them, as a female car user, aged 47, said:

It's not by chance that my hands look like this, I made that sacrifice [of buying a car] many years ago…My vehicle is my support…

4.2.6. Differences in car evaluation

Public transport users view the car in a more utilitarian and functional way: the car is useful at night, for shopping and for long trips:

The car is not for the city, only for long trips (male, aged 50, non-car owner).

I only use the car at night or for shopping (female, aged 43, car owner).

When talking about car disadvantages, car users mentioned cost, traffic congestion, the difficulty and cost of parking. For some car users cost is the most negative aspect about using a car, but they seemed to only consider the cost of fuel and not all the costs associated with owning a car. Although they acknowledge that using public transport would be cheaper, they apparently do not intend to switch modes.

4.2.7. Environmental concerns

Only one female car user mentioned environmental concern about car pollution as a motive that eventually might make her switch to public transport:

[What would make you switch to public transport?] Ok, maybe, if we would talk about nature, the environment and so on… (female, aged 21).

Another female car user (aged 47) referred to car pollution as a negative aspect of her car but only because her car was very old, and not as a negative aspect of cars in general. Other respondents as well said that buses are also responsible for pollution, so they do not feel the need to use their car less.

4.3. Travel behaviour and future mode choice intentions

In Table 3, factors contributing and acting as a barrier to public transport are shown. Several factors of the public transport service were perceived as barriers to public transport. This indicates that to attract more people to public transport, the service must be improved in order to meet people's needs. The fact that some car users said they might use light rail, because it is perceived as much better than bus, reinforces this idea.

Other factors will also influence mode choice. For instance, the type of journey is also relevant when choosing a mode of transport and the importance given to factors affecting that journey is different. Travel time is a key factor when choosing a mode of transport for work journeys. If the pressure to be on time does not exist, like for leisure journeys, the value attached to time is lower.

Some of the respondents were more likely to use alternatives to the car for regular journeys than others. Two of the key factors are the attitude towards public transport and attachment to the car. It is clear that some of the car users have very low intention to use alternative modes. When asked what would make her stop using her car, a female, aged 21, said:

> I think nothing!

Table 3
Motivations and barriers to public transport use

Motivations	Barriers
Better service	Not having alternative to car
Be certain that the timetables are performed	Lack of direct transport
Direct transport from home to work	Lack of availability of buses
More information available and easy to understand	Long travel time
Save money	Buses' unreliability
Not having a parking space	Do not known what to expect
More comfort and air-conditioning on vehicles	Need for multiple journeys
Contribute to a better environment	Poor information
	Not frequent enough
	Bus stop too far
	Buses are smelly and crowded
	Feeling of personal insecurity
	Having to use more than one transport
	Bad waiting conditions
	Negative feeling towards public transport
	Habit of driving

The same participant, when further asked if she would use public transport if it was improved in order to meet her needs, said:

> No! If I had my car no, because when having my car available I prefer to go in my "little" car.

However, respondents with more favourable attitudes towards public transport, less attached to their car and tired of driving, showed high switching behaviour:

> I often get really tired of driving the car, and I would prefer to catch a bus if I had the time (female, aged 39, car user).

Although they want to change, they believe that there are too many obstacles to travelling by public transport. Some obstacles include the need to take children to school, having to use the car during the day for work-related trips or not having a viable alternative form of transport. This shows that although those individuals make the same travel choices, their attitudes, motivations and future intentions are significantly different. This indicates that segmentation should emphasize attitudes and values and not rely exclusively on socio-demographic variables and transport usage.

5. Discussion of findings

5.1. Bus travel

To be able to compete with the car, the bus service must offer the quality desired by regular and potential users. From the interviews it can be seen that potential users could be the ones who show less attachment to their car, are often tired of driving and the ones with positive attitudes to public transport. It is important to understand what these individuals want, what are the service attributes most important to them, and what would make them switch to using public transport.

Travel time and reliability play a key role and are determinants of transport mode decisions, though travel time importance is dependent on the type of journey. For journeys related to work/school activities time importance is much higher. Respondents want to feel in control when travelling and this means brief waiting times, a fast journey and reliability. Also, there is a preference for a direct frequent public transport service. In general, people do not want to have to change vehicles during their journey, unless this is perceived as easy and fast.

Respondents want to have a comfortable relaxed journey, preferably having a seat on the vehicle, a nice ambience free from unpleasant smells, a not too crowded space and a smooth ride.

Interesting to note is that none of the respondents complained about the cost of bus travel and that most of the car users admitted that bus travel would be cheaper than car. This implies that cost is perhaps less important than most surveys suggest (Guiver, 2007). Yet respondents

with lower income found the new light rail system expensive.

Some respondents acknowledge that some incidents may occur, but expect an adequate and fair response from the bus company. For example, some bus users were very upset due to not being informed about changes in bus routes. Furthermore, when people talk about bus travel, they tend to focus on the worst performances, which may be more influential than average performances (Guiver, 2007). This has important implications for bus companies, in that they should consider how they treat passengers who for some reason are disappointed with the service offered, a finding which is consistent with previous research (Friman et al., 2001; Friman and Gärling, 2001; Guiver, 2007). Also word-of-mouth advertising plays an important role in promoting bus service (Ayako and Satoshi, 2007) and if people have positive experiences with the service, they are more likely to recommend it.

Information is another very important factor and the perceived lack of it can act as a barrier to use public transport. Some infrequent users and non-users claim to lack information about the bus system and perceive public transport as difficult to use. Some car users say they might use the bus service if they have more information. Providing greater access to service information and more interactive services (e.g., real-time timetable information) may be a way to increase individuals' perceptions of control with public transport (Gardner and Abraham, 2007).

5.2. Light rail travel

It is interesting to note that car users have highly positive attitude towards light rail because they perceived it to be much better than the bus, not only on tangible attributes such as reliability and comfort but also on intangible attributes such as transport status and ambience. Nevertheless, this may be due to the novelty of the light rail system in the Porto region. Public transport users' views on light rail were not so enthusiastic, especially the low-income respondents. This could be explained by the higher cost of light rail and the fact that the bus service reaches a wider area. These respondents want a quality service independently of the transport being used, in line with evidence that has suggested that for similar service attributes, rail and bus services have the same ridership attraction (Ben-Akiva and Morikawa, 2002). However, from the respondents' attitudes towards the two modes, it seems that intangible attributes of the rail and bus are perceived to be different which may lead to a preference for light rail.

5.3. Misperceptions of bus and car travel

Generally, regular bus users have more positive beliefs about bus service than non-users and perceived fewer barriers to using buses, which is consistent with the findings from previous studies (Anderson and Stradling, 2004; Beale and Bonsall, 2006; Ibrahim, 2003). People who never use buses or have only used them many years ago have a very negative image of the bus service. This may be due to their lack of actual knowledge about bus service and how much they have improved since they have last used them. Also, they may have based their beliefs on opinions given by others, and on observing, as car users, long queues of people waiting at the bus stop in the rain (Beale and Bonsall, 2006). This implies the need to change negative attitudes towards the bus and to overcome perceived barriers to bus use. Furthermore, non-users perceptions may be changed without changing the level of service. Still, the service must meet the level of service required by non-users in order to alter previous negative perceptions. This means that when implementing marketing initiatives, the actual attractiveness of public transport has to be evaluated. If public transport is not an attractive alternative to the private car, initiatives that attempt to successfully persuade car drivers to try public transport will only reinforce the individual's prior belief that car transport is better (Thogersen, 2006).

Respondents evaluate bus and car travel using different criteria, especially those who only use the car. Journey time by car is perceived to be much less than it may actually be. Car drivers feel more in control inside theirs car and feel they can avoid traffic by taking alternative routes and thus perceive journey time to be less by car than if they use public transport. Furthermore, they think public transport is so unreliable that they would waste a lot of time waiting for the bus and on the journey. This suggests that public transport policies, in addition to improving public transport reliability and travel times, should also promote public transport as a more positive experience (Gardner and Abraham, 2007).

Many of the car users interviewed in this study tend to underestimate the cost of car travel and only considered fuel and parking costs. Parking is very important for those who work in areas where it is difficult to park or with parking controls. Yet some respondents say that even in the city centre where it is difficult and costly to park, they can always find a space to park even in an illegal non-parking zone. This indicates that tightening parking controls could be a way to influence drivers to switch to public transport as long as an efficient public transport exists (Hine and Scott, 2000).

5.4. Dependence and attachment on cars

Not all respondents attach the same importance to the car. Some respondents like the social interaction of public transport and do not assign a high value to the autonomy, privacy and comfort of the car. It is interesting to note that, although these were mainly non-car users, amongst the car users there were some (especially women) who were anxious to get out of their cars because they found driving very stressful. In contrast, some of the car drivers were very

psychologically attached to and dependent on their car and exhibited deeply negative feelings towards public transport.

It must be acknowledged that some people do not only drive their car because they need to go somewhere, but also because they love driving. Perhaps, this is one of the reasons why attempts to influence car use have not been very successful, and it might explain the resistance to policies aimed at reducing car use (Steg, 2005). It appears that the amount of travel people demanded is heavily influenced by their attitudes towards travel (Parkany et al., 2005), not only for entertainment purposes but also for work/school-related activities (Mokhtarian et al., 2001). This implies that policy-makers should understand the role of subjective characteristics (Mokhtarian et al., 2001) and consider not only the instrumental motives, but also the many symbolic and affective values of various modes of transport (Steg, 2005).

Reduction of car use should not be expected simply by requesting individuals to do it voluntarily (Tertoolen et al., 1998). In order to reduce car dependence it is necessary to promote several measures, such as modifying the opportunities for travel by improving the availability of alternative modes; modifying the inclinations and preferences towards travel by alternative modes; and modifying the lifestyle patterns that generate obligations to travel from current origins to present destinations (Stradling, 2003).

5.5. Environmental concerns

In this study, environmental concerns about car use did not seem of importance in the travel mode choices of the respondents. This is consistent with studies which suggest that although information about the negative environmental effects of the car use raises some awareness, it is usually insufficient to change behaviour (Anable, 2005; Hagman, 2003; Tertoolen et al., 1998). However, there is some evidence that the inclusion of environmental concern measures provides additional beliefs that can be targeted in order to change behaviour (Anable, 2005). Advertising campaigns with the intent of increasing public transport usage should focus on the environmental benefits of using public transport by tailoring public transport as an environmental symbol, thus countering the car as a status symbol (Golob and Hensher, 1998).

5.6. Insights for policy

Evidence suggests that policies should be designed towards specific target groups (Anable, 2005; Jensen, 1999; Steg, 2005). Marketing campaigns should target individuals that are most motivated to experience public transport when they need it (Thogersen, 2006). This suggests the need for segmentation taking into account travel attitudes and behaviours. Segmentation's real value lies in its ability to be used in the design of achievable strategies by using the information to guide decisions (Anable, 2005). Policies that aim to influence car usage should be targeted at the market segments that are most motivated to change and willing to reduce frequency of car use. Car users attached to their car and with negative feelings towards public transport showed no intention to shift their behaviour and marketing campaigns directed at this group would probably not be successful. Recent studies have revealed the importance of individuals' attitudes to the acceptance of transport demand policies (Beale and Bonsall, 2006; Thorpe et al., 2000). Furthermore, the negative beliefs of individuals with no desire to use a bus are very difficult to overcome (Beale and Bonsall, 2006).

Recent studies have revealed that experience of public transport can reduce drivers' negative perceptions (Brown et al., 2003; Fujii and Gärling, 2005; Thogersen, 2006). To induce experience among car users, several initiatives can be used, such as free trips or reduced fare. Fujii and Kitamura (2003) study the influence of offering a one-month free bus ticket on drivers' attitudes towards bus and it seems to have the potential to change habit, attitude, and travel mode choice. Another study (Ayako and Satoshi, 2007) found that the increase in bus use persisted after the period of free bus tickets. These imply that a marketing technique such as offering free bus tickets may be able to promote persistent bus use (Ayako and Satoshi, 2007). Yet other measures to reduce car use, like economic disincentives, do not directly lead to car use reduction, although it affects the motivation to plan car use reduction (Jakobsson et al., 2002). Therefore, in order to reduce car dependence, a clear understanding of the nature, extent and causes is needed (Stradling, 2003).

6. Conclusion

This qualitative study has highlighted some key factors influencing mode choice and the main influences that affect it positively and negatively, and the need to investigate the motivations and barriers to public transport use. These findings served as the basis for developing a model that attempts to structure the mode choice process. This model and the qualitative study were used to design a survey questionnaire that was administrated to the general public in the metropolitan area of Porto.

The key findings indicate that in order to increase public transport usage, the service should be designed in a way that accommodates the levels of service required by customers and by doing so attract potential users.

Furthermore, attitude towards transport is an important determinant for mode choice. It is not expected that all car users, in general, will change from driving a car to using public transport exclusively by improving the public transport system (Jensen, 1999). But the intention to switch mode expressed by car users and occasional public transport users shows that improving the image and levels of service being offered can attract potential users to the public transport service. However, if the public transport

service is unreliable, has a low frequency or lack of comfort, people are likely to shift to using cars because they do not perceive public transport as a viable alternative to them.

Finally, it is necessary to understands people's needs and expectations and acknowledge that different people have different needs and are motivated by different factors. This implies having detailed knowledge not only of public transport users but also of non-users. There is a need to identify the primary reasons for not using public transport and, if possible, remove potential barriers to public transport usage. For instance, car users have lower perceptions of public transport than public transport users, which means that public transport is actually better than they think. Thus, one strategy to attract users could be (both) improving public transport image, and providing more information about the transport system to the groups with higher switching potential.

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