EFFECTS OF SOCIAL REPRESENTATIONS ON COST ESTIMATION OF PUBLIC TRANSPORT AND CAR

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ABSTRACT:

The purpose of this study is to understand the economic impacts of social representations of transportation modes; in particular, the cost estimation of mobility using the two modes of transport in relation to its social representations. In order to achieve that we developed a questionnaire for collecting social representation that we passed with users sample of the two modes; by asking respondents to associate qualifiers car and public transport and to structure these elements together, according to their significance and connotation**.** Also, participants were asked about the annual cost of vehicle and the monthly cost of their travel using public transport.

A survey was conducted amongst 56 users of both types of transport. Participants ranged in age from 19 years to 56 years; as a result the average was 37 years. The results indicate that the car is the most widely used in mobility for the purpose of travel, tourism and it's the absolute choice and that total by over 70%. The majority of people have positive social representations of car and negative social representations of public transport. For costs estimation of car, 93% of participants who overestimate their spending think that car requires a lot of expenses. 60% of participants who underestimate their expenses think that public transport is expensive. Contrary to participants how overestimate their expenses, 67% of them think that public transport is inexpensive.

Keywords: public transport, car, social representations, cost.

Introduction

The transport of the economy infrastructure, influence at the same time, directly or indirectly, in the social life of individuals through what is achieved by the process of communication and change in social behavior between the elements of the community in general, and by facilitating the process of social communication between the countryside and the city in the same country, which contributes effectively to promote in social evolution[1].

[1] Cesar A. V. Queiroz, Surhid Gautam (1992), Road Infrastructure and Economic Development: Some Diagnostic Indicators, World Bank Publications.

Dependence on car or public transport is a complex process that involves both individual arbitrations and development choices of government [1]. Always opting for the most efficient mode of transport, most households choose spontaneously the car insofar use another mode of transport would mean a longer travel time, more complicated and dangerous path, less pleasant, etc. In fact, much of the effectiveness of the car is not based on its own merits, but on all the devices in the service of drivers. Automobile dependence is based on the lack of credible alternatives, particularly in urban areas sparsely populated, where transport is wasteful and slow [2]. Reduce car dependency is therefore judicious solution to minimize the negative impact of car on public space to allow a more equitable sharing of the roads, and to develop new services for non-motorists[3] (real-time information, parking bicycles, pedestrian street furniture, etc.)

Whatever the cost, choosing public transport or private car is depends on many social norms, the high cost is the price may be what it takes to take into account social status, and on the contrary, in some communities that are interested in the environment and economic and social cost of the public, use public transport is a necessity.

Research Problem

Mobility is an important process in the life of any person, so choose the right type of transport to move to work, study or spend every day needs an important process in our daily lives. Transport patterns are not the sole factor that affects psychological well-being. Also psychological traits affect the choice of transport mode. To understand transport and travel the behavior and its decision making process should be exanimate. When examining behavior the obvious literature to consider relates to attitudes.

Social representations theory rejects the idea that everyday behavior involves a scientific approach to objects, people and events, where understanding is merely information processing. Social representations are shared perceptions of the nature of phenomena and the cause of events. Social representations theory proposes that attitudes reflect underlying social representations of reality that are widely shared in society[4].

Many of us offers social interpretations and comparisons of used transport types, which relate to the characteristics of each type, on the one hand, on

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[1] Robin Hickman, David Banister (2014), Transport, Climate Change and the City, Routledge, p 285

[2] Tasleem Shakur (2005), Cities in Transition: Transforming the Global Built Environment, Open House Press, P 126

[3] Un-Habitat (2012), Cities in a Globalizing World: Global Report on Human Settlements, Routledge, P 132.

[4] S. Caroline Purkhardt , Transforming Social Representations: A Social Psychology of Common Sense and Science, Psychology Press, 2015, PP 3-5

the other hand either choose one mode or another of transport is influenced by the related cost. Most economic research shows that whatever the cost category, the public transportation is less expensive than individual transport. The importance of public transport seen in the cities and not on an individual level, but also particularly on the public level, if we consider the social cost[1].

Based on the foregoing, we propose to study mobility through social representations that individuals made in different modes of transport. The purpose of this study is to collect the social representation of the car and public transport, in a first step. In a second step, we seek to highlight the representations influence of the two modes on the economy and the reality of their use.

To better understand the economic impacts of social representations of modes of transport, in addition to the economic and environmental impacts more widely accepted, we developed a questionnaire to collect social representation that we passed with users sample of the two modes; by asking respondents to associate qualifiers car and public transport and to structure these elements together, according to their significance and connotation. And, which allow us to answer the following questions:

- What are the habits of mobility?
- How to structure social representations of people use the car and those use public transport?
- Are positive social representations of a particular type of transport affecting their choice as a way of transportation?
- Are social representations about cost affecting the estimate of cost of transport?

Definition of the basic concepts

Own car:

The car is synonymous with freedom and social status. It is the means of transport of individual in excellence. The master of the situation in the near distance, the car has range of advantages compared with the others modes of transportation, as well as its image, they are stereotyped, can transmit to any person; it can transports five people, and even some of the equipment. It also can be used in the short distances and long alike, and in different places and even trends that require access to wire rough terrain or deserts or remote areas as a result of non-compliance with specific lines or regularly scheduled[2]

[1] توفيق الحارث،(2011) مساهمة النقل الجماعي في حل مشاكل المدن العربية، جامعة قرطاج ٧ نوفمبر – تونس، ص 8

[2] Enne de Boer (2013), Transport Sociology: Social Aspects of Transport Planning, Elsevier, pp 212-214

Public transport:

Oxford dictionaries define public transport as buses, trains, and other forms of transport that are available to the public, charge set fares, and run on fixed routes[1].

Cities do not dispense with the mass transport: the transfer of individuals to places of work, shopping or get services, the type and form of this mode of transport associated with the number of passengers and the distance required to reach the cut. The most important modes of public transport is the subway, train Urban (tramway), train (train), bus, electric bus (trolleybus), the train wired (funicular), boat[2]

Social representations:

Moscovici defines social representations as " System(s) of values, ideas and practices with a twofold function; first, to establish an order which will enable individuals to orient themselves in their material and social world and to master it; and secondly communication to take place among the members of community by providing them with a code for social exchange and a code for naming and classifying unambiguously the various aspects of their world and their individual and group history" [3]. A social representation is a set of knowledge and beliefs structured in a given object, developed and shared by a social group.

Carpentier (2007, 2008) examined the representations of modes of transport and identifies seven characteristics on which modes are compared by individuals interviewed: speed, comfort, cost, flexibility, stress, danger and pollution. He noted that the representation of a method depends on three main dimensions: the spatial dimension (residential stability and spatial practices), social dimension (social position and network of relationships) and psychological aspects (cognitive and social performances). This approximates the triangulation concept of identity displacement proposed by Ramadier et al. (2007). According to these authors, the position of an individual in relation to the three dimensions can be seen as explanatory factor mobility[4]

[1] Maurice Waite (2007), Oxford Dictionary and Thesaurus, Oxford University Press

[2] Tawfiq Balharith (2011), P18

[3] Gerard Duveen, Barbara Lloyd (1990) , Social Representations and the Development of Knowledge, Cambridge University Press, USA, P1.

[4] Ghislain BOURG(2011), L'apport de la communication engageante et des représentations sociales dans le cadre de la promotion de l'éco-mobilité, Université de Bourgogne & Laboratoire Socio-Psychologie et Management du Sport, P 144

Research Methodology, **Participants and Procedure**

We used descriptive approach because it fits with the study and because the studied phenomenon can't occur in the laboratory, where this approach is to collect everything related to the phenomenon under study using observation and interview and questionnaires, and then compile the information in the tables and prepared to extrapolate and draw conclusions.

The target population was 70 users of both types of transport, which selected according to their availability. The participants represented a range of socioeconomic levels and lived in urban areas, from the cities of Ngaous and Ain Touta in the wilaya of Batna. The questionnaire was applied by researchers in the city of Ngaous, while were recruited to "ELBARAKA" Society, which distributed the questionnaire and applied to the sample of Touta city.

After the distribution of the full number of the questionnaire, 64 of answers were recovered and acceptance of 56, 6 answers were canceled for not answering the most questions. Participants ranged in age from 19 years to 56 years, aged 37 on average. The majority of participants (80.4%) were male and (60.7%) have a driving License. Demographic characteristics of participants can be found in the following table.

TABLE1:

The demographic characteristics of participants

Demographic characteristics		%
Gender	Male	80.4
	Female	19.6
Place of residence	Ngaous	55
	Ain Touta	45
current employment	Jobless	7.1
	Working with weak income	26.8
	Working with average income	37.5
	Working with high income	3.6
	Student	10.7
	0ther	14.3
highest level education	Primary school	0
	Middle school	16.1
	High school	35.7
	Univercity degree	46.4
	Other	1.8
Driving license	Yes	34
	No	22

Instruments

Most methods for collecting social representation consist firstly in identifying its components and to studying their structure. In the hierarchical method evocation (Vergès, 1992), it is asked respondents to make free associations from an inductor word. Participants must state the words that

come to mind when a word is presented to them. The researcher became interested in the frequency of citation of a term (how many participants have stated) and the appearance of the term rank (is it set in the first or not).

However, the rank of appearance is not necessarily a good indicator of the importance of an element. Indeed, the elements can be mentioned first surface. Abric (2003) proposed that the rank of appearance by a rank of importance. As in the previous method, the first task of free association collects the elements that make up the semantic universe of the object studied. Then, asked the participants to classify words that he stated in terms of the importance which he attaches to them.

This second method used to collect the contents of the representation but also to obtain quantitative indicators, frequency and importance, the intersection provides information on the status of an item. For example the elements cited frequently considered very important and form the central core. The minor elements are part of the first or of the second periphery according to their frequencies. These elements serve to illustrate the central elements or conducive to the experience of a participant. Finally, the important but infrequently are "contrasted." They may indicate the presence of a minority of the survey population had a different representation or they may complete the first periphery.[1]

Our questionnaire collection representation is based on the method developed by Abric. For each mode of transport, car and public transport, participants had to answer three questions. The first was used to collect the content of the representation. The second possible to note the importance of different elements mentioned. Finally, the third question was about the connotation of the elements mentioned: these were they positive, neutral or negative. Specific instructions for each question are shown below.

Free association set point: What are the first five words or phrases that come to your mind when you talk about car / public transport?

Set point of importance : Review the words or phrases and rank them from 1 (which is the most representative) to 5 (which is the least representative) noting the numbers in adjacent squares.

Set point of polarity: For each word or phrase, indicate whether it is a positive (note "+"), neutral (note '=') or negative (note "-").

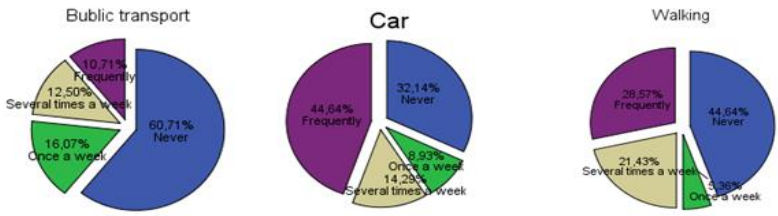
The questionnaire contained 15 items to collect information from the study participants about some social representations by asking questions directly. Measurements of modal practices were performed by two questions. Participants were asked how often they used the car, public transport or walking for travel related to work, shopping or leisure. Also, participants asked six questions about their social characteristics. They asked to indicate

[1] Ghislain BOURG(2011), pp 146-147 .

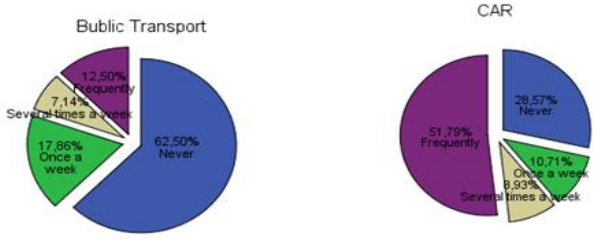
their gender, age, current employment, educational level, geographic area of residence, and driving license. Finally, to study the transport cost estimation, participants were asked about the annual cost of vehicle and the monthly cost of their travel using public transport.

Results

1. Habits of mobility



Figures 1: Mode of transport using in daily mobility(work / study / or other activities)



Figures 2: Mode of transport using in the travel and tourism

The results indicate that the car is the most widely used in mobility for the purpose of travel, tourism and it's the absolute choice by over 70 percent. On the contrary, the use of the two types of transport equally, to spend daily needs, as well as walking which is used by 66%.

2. Structure of social representations of the car and public transport

To analyze the representations, we have grouped the terms stated by the participants in several categories. In the end, 16 categories were selected for public transport and 17 categories for the car. Figures 1 and 2 show the components that make up the social representations of public transport and the car according to their citation frequency, their significance and

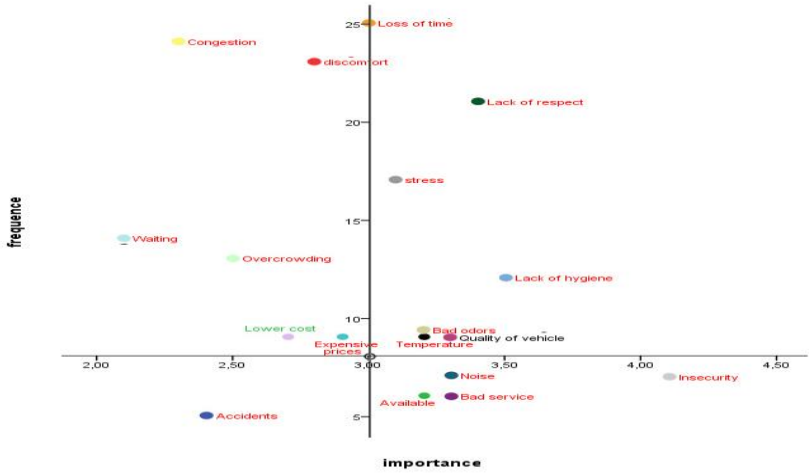
connotation. The citation frequency of an element refers to the number of participants who mentioned this element of the 56 respondents. On average, an item was mentioned by 8 people (m = 8.32). We will consider an item is frequent if its citation frequency is higher than average. Among the words cited by less than 8 participants of the sample, we have retained only those that have been cited by at least 5 participants.

The importance of an element is the average of the scores given by participants who cited it. The average size of an element is 3.12. An item with an average importance less than 3 is considered important element. Conversely, an element having a size greater than or equal to 3 is considered low important.

Finally the connotation of an element is its average score of connotation (-1, 0, 1) assigned by the participants cited this element. An item must be considered negative connotation if its average is less than 0.5; it will be considered neutral if it is between 0.5 and 0.5 and positive if it is greater than 0.5.

If a respondent stated several terms relating to the same element (e.g. freedom, independence, autonomy), the item was counted only once and we did the score for importance and connotation assigned to different terms obtain the average importance and average connotation of the item for the participant.

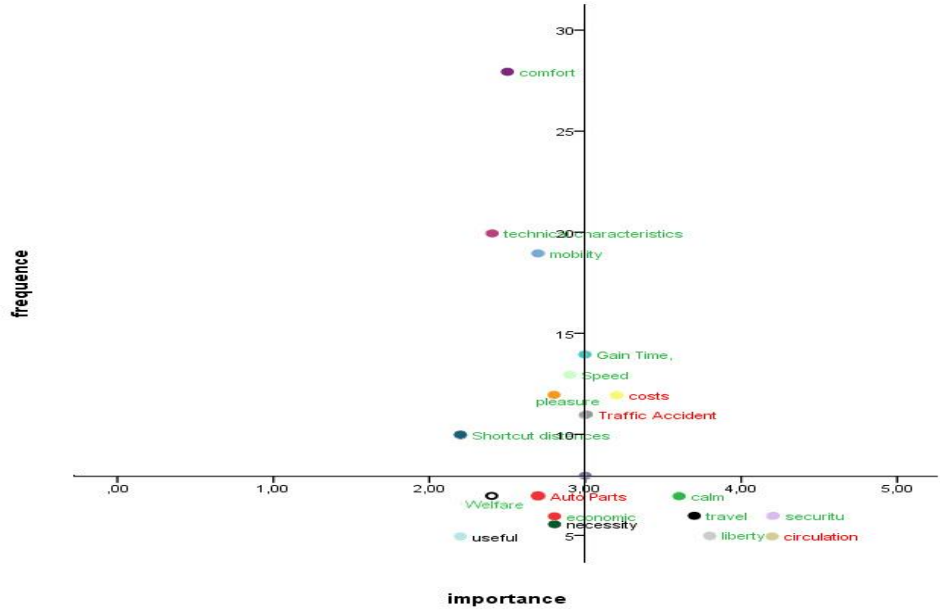
If we follow the model proposed by Abric (2003) classification, frequent and important elements make up the central core. In the case of public transport (Figure 3), the central elements concern the congestion, discomfort, waiting, low cost and overcrowding. Issues related to time loss, stress, lack of hygiene and lack of respect, made the first periphery: although very frequent, they are considered less important. Infrequent items focus on accidents that oppose the noise, insecurity, bad service and availability.



Term a: negative connotation; Term b: neutral connotation; Term c: positive connotation

Figures 4: social representation of public transport depending on the frequency, significance and connotation of the elements

Frequent and important elements in the representation of the car (Figure 4) relate: comfort, mobility, technical characteristics, speed and pleasure. However, the car is the opposite of public transport: it is comfort, fast, allows you to be mobile but expensive and exposure to road traffic accidents. The concepts of liberty, calm and travel are less frequent and less important. However, it does not seem to have special meaning: the car has simply become indispensable. In the first periphery, the comfort of the car is offset by maintenance and insurance costs, which come realize the problems of cost, as well as traffic problems and parking. Finally, infrequent elements refer to security, traveling, going on vacation and calm, but also the constraints of accident risks.



Term a: negative connotation; Term b: neutral connotation; Term c: positive connotation

Figures 4: social representation of the car depending on the frequency, significance and connotation of the elements

3. ***Social representation and choice transportation:***

TABLE2:

Crosstabs S.R of P.T * social representation of CAR * Daily Needs of Car

Daily Needs Of Car			social representation of car			Total
			0	POSITIF	NEGATIF	
Never	S.R.of P.T	POSITIF	0	1	2	3
		NEGATIF	1	13	1	15
	Total		1	14	3	18
Once a week	S.R.of P.T	POSITIF		2		2
		NEGATIF		3		3
	Total			5		5
Several times a week	S.R.of P.T	NEGATIF	1	6	1	8
	Total		1	6	1	8
Frequently	S.R.of P.T	POSITIF	0	2	0	2
		NEGATIF	3	18	2	23
	Total		3	20	2	25
Total	S.R.of P.T	POSITIF	0	5	2	7
		NEGATIF	5	40	4	49
	Total		5	45	6	56

TABLE3:

Crosstabs S.R.of P.T * social representation of car * Daily Needs of public transport

Daily Needs of public transport			social representations of car			Total
			0	POSITIF	NEGATIF	
Never	S.R.of P.T	POSITIF	0	4	1	5
		NEGATIF	4	22	3	29
	Total		4	26	4	34
Once a week	S.R.of P.T	NEGATIF		8	1	9
	Total			8	1	9
Several times a week	S.R.of P.T	NEGATIF	1	6		7
	Total		1	6		7
Frequently	S.R.of P.T	POSITIF		1	1	2
		NEGATIF		4	0	4
	Total			5	1	6
Total	S.R.of P.T	POSITIF	0	5	2	7
		NEGATIF	5	40	4	49
	Total		5	45	6	56

TABLE4:

Crosstabs S.R.of P.T * social representation of car * Travel using car

Travel using car			social representations of car			Total
			0	POSITIF	NEGATIF	
Never	S.R.of P.T	POSITIF		2	2	4
		NEGATIF		11	1	12
	Total			13	3	16
Once a week	S.R.of P.T	NEGATIF		5	1	6
	Total			5	1	6
Several times a week	S.R.of P.T	NEGATIF		5		5
	Total			5		5
Frequently	S.R.of P.T	POSITIF	0	3	0	3
		NEGATIF	5	19	2	26
	Total		5	22	2	29
Total	S.R.of P.T	POSITIF	0	5	2	7
		NEGATIF	5	40	4	49
	Total		5	45	6	56

TABLE5:

Crosstabs S.R of P.T * social representation of car * Travel using public transport

Travel using public transport			social representations of car			Total
			0	POSITIF	NEGATIF	
Never	S.R.of P.T	POSITIF	0	3	0	3
		NEGATIF	5	25	2	32
	Total		5	28	2	35
Once a week	S.R.of P.T	POSITIF		1	1	2
		NEGATIF		7	1	8
	Total			8	2	10
Several times a week	S.R.of P.T	NEGATIF		4		4
	Total			4		4
Frequently	S.R.of P.T	POSITIF		1	1	2
		NEGATIF		4	1	5
	Total			5	2	7
Total	S.R.of P.T	POSITIF	0	5	2	7
		NEGATIF	5	40	4	49
	Total		5	45	6	56

The analysis of the previous tables shows the following results:

- Individuals, who use the car to spend daily needs, are the people who have positive social representations of car and negative social representations of public transport.
- The majority of people, who do not use public transport (50%), to spend daily needs, are the people who have positive social representations of car and negative social representations of public transport.
- Individuals, who use the car in travel and tourism (64.28%), are the people who have positive social representations of car and negative social representations of public transport.
- The majority of people, who do not use public transport (57%), in travel and tourism are the people who have positive social representations of car and negative social representations of public transport.
- The majority of people using public transport, to spend daily needs or for travel, have negative social representations of public transport.

4. Social representations and the estimate of transportation cost

- ***Costing***

The analysis of data for estimating the cost of transportation, shows that 50% of the participants are using the car and give an estimate of the costs relating thereto, 23.2% using public transport and give costs estimates, 14.3% using both types of transport and give costs estimates, while the 12,5% rest, either do not give cost estimates or walking. Comparing the costs related to both types (Table 6), we note that the average annual costs

estimate of the public transport is 13505 DA, which is less than the average annual estimates for the car, estimated at: 96576 DA.

TABLE6:
Costs estimates of Car and public transport

	N	Minimum	Maximum	Average
Cost estimation of car	36	28000,00	345700,00	96576,9444
Costs estimation of public Transport	51	,00	108000,00	13505,8824
N valide (listwise)	36			

Major items of expenditure related to car costs include: discounts, maintenance and repair, spare parts and accessories, fuel, insurance. Participants make a calculation in 3 categories:

- 44,44 % of participants greatly underestimate their expenses, taking into account the price of fuel and some items of expenditure .
- Only 13,89 % include major items of expenditure.
- Conversely, 41, 67 % strongly overestimate their expenses by adding another expense (tax schedule).

Most participants grossly underestimate the cost of traveling by car. Buying a vehicle is a big investment, many households looking to return as quickly as possible by a sometimes excessive. This behavior is not rational to the extent that operating costs are very high, not necessarily that users will realize this.

These results correspond with the survey of a research consultancy specializing in urban travel, ADETEC has realized in 2008 a survey of car drivers on the cost per kilometer of their vehicle. The responses were as follows: 54% of respondents greatly underestimate their expenses, 20% also underestimate, but to a lesser extent (consideration of fuel and insurance only). Only 15% include major expenditure items and make a calculation pretty much just. Conversely, 11% strongly overestimate their costs by applying the tax schedule.[1]

- ***Social representations and the estimate of transportation cost***

Results show that majority of participants who underestimate their expenses or overestimate their expenses of public transport have the same social representation (Negative). But, in regards to social representation related to cost, 60% of participants how underestimate their expenses think

[1] ADETEC(2008),available on http://www.adetec-deplacements.com

that public transport is expensive. Contrary to participants who overestimate their expenses, 67% of them think that public transport is inexpensive.

TABLE7:

Crosstabs of Costs estimates of public transport * social representation of public transport

Costs estimates of public transport	Public transport is inexpensive			Total	Social representation	
	Not agree	Don't know	Agree		Positive	Negative
underestimate their expenses	6	1	3	10	1	9
overestimate their expenses	4	0	8	12	3	9
Do not use public transport	19	5	10	34	3	31
Total	29	6	21	56	7	49

For costs estimates of car, table 8 show that the majority of participants who underestimate their expenses, overestimate their expenses or give right estimation of car, have the same social representation (Positive). 93% of participants how overestimate their expenses think that car requires a lot of expenses and the car is expensive.

TABLE8:

Crosstabs of Costs estimates of car * social representation of car

Costs estimates of car	Social representation			Total	car requires a lot of expenses And it is expensive		
	0	Positive	Negative		Not agree	Don't know	Agree
Underestimate their expenses	1	13	2	16	5	2	9
Include major items of expenditure	1	4	0	5	0	0	5
Overestimate their expenses	2	12	1	15	1	0	14
No estimation	0	4	0	4	0	1	3
Haven't car	1	12	3	16	1	2	13
Total	5	45	6	56	7	5	44

CONCLUSION

This study focused on understanding the social representations of each of public transport and car, and its impact on the choices related to mobility, and as well as the estimation related to their use. The current study has uncovered that the car is more widely used in the travel long distances and although 40 percent use them to public transport at least once a week, most

of the respondents have negative social representations about public transport while the social representations about the car was positive. Most participants grossly underestimate the cost of traveling by car.

Social representations of collective transport show low social perception of the means of public transport, and the need for attention to the quality of services related to public transport and improve the quality of public transport and thus influence the use and cost related to it.

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