

Some new evidence in the determination of acceptability of urban transport pricing

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Abstract

In this paper we analyse which variables affect people reaction to urban pricing schemes. Most of works in this topic discover that the essential causes are not socioeconomic variables but the perceptions, attitudes and beliefs of respondents. In order to measure these concepts a Likert scale questionnaire was undertaken in a survey of 83 individuals grouping 19 items into seven categories: *sensitivity towards environmental problems*; *responsibility*; *style of life favourable to cars*; *perception of transport problems*; *sensation of freedom restriction*; *inequality and personal gains*, reserving an item, as a dependent variable, for *acceptance*. This questionnaire, along with the qualitative analysis from a previous focus group, shows the important differences between drivers and non drivers and the general strong public rejection. This belief comes along with the perception of the effectiveness of such a measure.

Among the explanation factors two ideas emerge: individuals are concerned about distributional aspects of pricing, not only in terms of income but in terms of use of space (it is considered a privilege for city centre's residents); secondly, and most important, there is a strong fear of lack of transparency in managing revenues (i.e. corruption) or mismanagement of the whole system.

The methodology uses qualitative analysis from focus group and employs frequencies of opinions –previously categorized into different groups- as an input for a regression model which was run using path analysis.

1. Introduction

Road transport is possibly one of the human activities with a greater impact on the environment. The construction and use of roads to move persons and goods generates important problems in terms of lack of space, severance, air pollution, noise, accidents, traffic congestion, global warming, etc.

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The experience has demonstrated that the solution for these problems (even just to alleviate congestion) is not the new investment to enlarge infrastructure capacity, since the new or improved infrastructure will be rapidly collapsed by new generated traffic, inducing, meanwhile, an increase of motorisation rates (Goodwin, 2001). Nowadays, the use of road transport pricing as an efficient policy to tackle with the problems arising from road traffic has been widely accepted among the economic literature since they charge drivers in a way in which they perceive the real social marginal costs that they produce (Pigou, 1920; Knight, 1924; Walters 1961).

There are important examples of applications of the principles of an efficient road pricing to urban traffic in the last decades since the pioneer experience in Singapur in 1975 (for instance in Oslo, Bergen and Trondheim, and more recently, in London). Nevertheless, despite the evidence indicating that these pricing strategies are potentially very effective to manage urban traffic congestion, urban road pricing (URP) is still rarely implemented, mainly because of the expected public resistance. In most of applications of URP around the world it has been observed that before the URP introduction there is a social resistance which drops gradually after its implementation (Solheim, 1992; CEPAL, 1999; Richards, 2006). Most of studies try to explain this phenomena based on that idea that after the URP, public are more aware about the effects of such policy. However, Schade (2007) explains these results on the basis of dissonance cognitive theory which states that individuals adjust their beliefs when a measure is unavoidable in order to reduce the stress caused by the contradiction between the real fact and their desires.

Acceptability, both public and political, is essential to guarantee the success of this policy since it has been identified as the main obstacle for implementing marginal cost pricing (Sikow et al, 2003). Building pricing policies against public acceptability may result in active resistance of groups, demonstrations or even sabotage (Schade, 2003) that may lead to a complete failure of the policy.

In the first part of this paper the main contributions about the factors affecting public acceptability of URP policies are reviewed. The second part of the paper proposes and applies a model to analyse public reaction and rejection to URP in the city of Las Palmas de Gran Canaria (Spain) using methodology that combines qualitative analysis from focus groups and employs frequencies of opinions –previously categorized into different groups- as an input for a regression model which was run using path analysis.

2. Factors which determine acceptability: an overview

The review of the economic literature suggests that there are two kinds of factors determining acceptability of URP: *socio-economic* variables and, *psychological* features such as attitudes, beliefs and perception of users. Nevertheless, most of works stress the weakness of socioeconomic variables (Schade and Schalg, 2000; Odeck et al, 1997; Rienstra et al, 1999; Harrington et al, 2000, Jaensirisak *et al*, 2005).

In order to develop an analytical framework variables in table 1 have been grouped into several categories, as presented in table 1:

- a) Perceptions about the current situation and the proposal solutions: In this category falls *awareness of transport congestion* (Jones, 1991; Schade, 2003; Steg, 2003), *important aim to reach* (Schade and Steg, 2003), and *perception of effectiveness* (Bartley, 1995; Schade and Schalg, 2000; Steg, 2003). It is expected that, the more awareness of transport problem will lead to higher acceptability of transport pricing.
- b) Social environment, where are considered:
 - o *responsibility*: one of the basic problems of traffic congestion is that “the individual does not see himself as responsible for causing the problem” (Schade

et al, 2003). This is the so-called Allmende dilemma (Hardin, 1968) or social trap (Platt, 1973). As individual contemplates himself as part of the problem, the acceptability of transport pricing arises (Steg, 2003).

- *expected behaviour of other's* and what is a desirable behaviour (Jakobsson et al, 2000; Schade *et al*, 2003) depends on cultural bases: “a high acceptability is to be expected mainly if social pressure to accept such a strategy is regarded as high”. In addition, this point is connected to the perception of fairness: if transport policies are seen positively developing good values to the community is expected more support. For this reason, perception of freedom and equity are essential.

c) *Civil rights*: People simply do not understand why they have to be charge for using the public space; it is supposed the common space is free. Also, privacy is affected by the way the pricing is applied, using cameras and potentially following the trip within the area. Although Richards (2006) finds that there are not too many complain in this aspect, may be due to the fact that society is changing in this point (Glaister, 2006), it is expected a rejection of the means from this bases.

d) *Equity issues*: one of the most relevant objections to transport pricing since these policies could be interpreted as totally regressive in terms of distribution. It is expected a strong rejection using this argument. Some authors consider that road pricing is a regressive mean (Layard, 1977; Glazer, 1981; Arnot et al., 1994) and some others it is a progressive mean (Foster, 1975), Small (1983, 1992) states that road pricing could be progressive given certain redistributions revenues. The perception of fairness is crucial to determine public acceptability (Jakobsson et al, 2000; Ittner et al, 2003). Proposal of pricing always lead to such a claim: fairness (Teubel, 2000). From the theory of justice (Rawls, 1971) there are two main principles which determines equity: principle of liberty: “each person is to have an equal right to the most extensive basic liberty

compatible with similar liberty for others” (Raux et al., 2003) and principle of difference / principle of equality of opportunities. Following Rawls, equity can be divided into three dimensions: spatial, vertical and horizontal equity. According to Viegas (2003) we will add a fourth dimension: longitudinal equity.

- e) *Psychological aversion* contains rejection to pricing, taxation and government intervention which have been founded largely as a general attitude among population. Price aversion occurs because people are reluctant to prices. This general aversion is due to the fact that prices are seen attached to goods and services market and totally unrelated to the public space. The idea of scarcity is not contemplate here and charging is only considered a cost, most of the times arbitrary, which will generate a cash-flow to be managed for politicians. Therefore, allocation of revenues is one of the key issues in most of studies. Besides, people do not like pricing, in general, as a mechanism of allocation. They prefer queues or, in some cases, government intervention. Along with aversion to pricing, public shows a general reluctance to government intervention and taxation. A significant portion of citizens do not trust government and, as a consequence, are unwilling to accept new charges. Moreover, they reject strongly more interventions in their private life. These kind of emotional reactions can be treated in the same way that those variables which have been used to explain rejection of nuclear power (Siegrist, 2000).

- f) *Expected outcomes for individual and society*: if individual expects benefits from the system he will vote favourable to its implementation (Steg, 2003), and its importance has been tested by different studies (for example, Schade, 2003 or S. Jeansirisak et al, 2003).

- g) *Aversions against market mechanism*: this is an observed regular behaviour and in these grounds it is reasonable we expect people reluctance to pricing. Rejection to market as a

system of allocation leads to a situation where, facing a scarce resource (space), queues are preferred instead of pricing.

- h) *System features*: price (see, for example, Jaensirisak et al, 2005), time and area of charging (see Kockelman and Kalmanje, 2005 for a description of different charging alternatives) and other attributes such as travel time savings, revenues allocation (public transport investments, enhance public transport or reducing its prices, or, see Farrel et al, 2005, reducing fuel taxes or improving road conditions) or environmental improvements (reducing noises level and pollution).

- i) *Socioeconomic variables*: such as income, car ownership, size household (see Harrington et al, 2001) educational level. It is normally assumed that low income groups would be oppose to road pricing because of their higher marginal utility of money and their decreased willingness to pay to reduce externalities. For opposed reasons high income groups would support these policies. In contrast, Rienstra et al. (1999) finds that the income level has not significant impact on the support for pricing measures and that the educational level has a positive impact in the public support of pricing.

Finally, although out of the scope of this study, it is important to consider the reaction towards transport pricing among the politicians and policy makers as they are the key point in the final application of these policies (see for this topic Johansson et al, 2003; Marcucci, 2003 and Link, 2003). Politicians act considering their possibilities to be re-elected (Mueller, 1989, 1996). As a consequence they tend to reject pricing means (see Frey, 2003), although they see people more reluctant to pricing measures than the reality. In fact, the majority of users could accept, under certain circumstances, a well explained set of pricing measures (Sikow-Magny, 2003).

Variable description		Jones (1991)	Bartley (1995)	Jones (1988)	Schaland et al. (1997)	Werhoef (1997)	Rienstra et al (1999)	Schade et al(2000)	Jacobsson et at (2000)	Harrigson et al (2001)	Schade et al. (2003)	Jones (2003)	Raux (2003)	Viegas (2003)	Sleg (2003)	Frey (2003)	Jaensirisak et al. (2003)	Ittner et al (2003)	Jaensirisak et al. (2005)	Farrell et al (2005)	Bondsall et al. (2005)	Glaister et al (2006)		
1	Perception of the situation	Awareness	?		?	?		?		?	?				?				?					
		Feasible alternatives					?									?								
		Knowledge about options				?																		
		Effectiveness			?	?															?			
2	B. Social environment	Responsibility			?			?							?									
		Social rules				?			?							?								
		Expectations other's							?	?														
		Expectation desirable behaviour								?														
3	Civil rights	Freedom							?														?	
		Privacy																						?
4	Equity issues	Revenues allocation		?								?									?			
		Fairness-equity				?				?						?	?							
		Social exclusion																					?	
		Spatial equity											?	?	?									
		Horizontal equity												?	?									
		Vertical equity												?	?									
5	Expected social-individual gains	Longitudinal equity												?										
		Expected outcome/benefits								?						?		?						
		Important aim to reach				?																		
		Expected social outcome							?										?					
6	Psychological aversions	Pricing aversion														?								
		Taxation aversion															?							
		Government aversion															?							
7	System features	Journey length				?																	?	
		Travel time savings									?													?
		Environmental improvements																						?
		Charing area / type of c.																						?
8	Socioeconomic variables	Educational level					?	?			?	?												
		Size household									?													
		Car ownership									?													
		Income				?	?	?	?															
		SE in general				?	?	?																?

3. Qualitative analysis: focus group

We assume that people's ideas about congestion pricing or any transport policy are produced collaboratively, through social interactions and, as a consequence, this social interaction should be observed in a context of a focus group; this technique is widely used in marketing and social sciences (see, for instance Greenbaum, 1993) as a way to explore public reaction towards certain interesting topics, ideas, products and campaigns before they are launched. Focus group provides a more in depth look for the question and is claimed to be more productive than one-to-one interviews and (Assael, 1997; Jordan, 1997; Cateral and Maclaran, 1997).

Ten focus group interviews were carried out, incorporating all together 81 participants (see table 2). Starting with previously mentioned recommendations we began splitting the participants between drivers and non drivers and, within this group separating for sex and age into three categories. Half of participants were recruiting among campus students and the rest of them were selected randomly, according with quota of age and sex by phone.

Table 2. Individual characteristics in the sample

Age \Sex	Male	Female	Male	Female	Total
	Non drivers		Drivers		
18-24	8	5	10	17	40
25-45	4	5	11	10	30
> 45	1	5	2	3	11
Total	13	15	23	30	81

After the focus group, individuals were invited to fill a Likert scale questionnaire with 19 items to measure attitudes, beliefs and perceptions about transport, environment, styles of life, equity and general perception of pricing schemes. This questionnaire was filled individually. The age of the participants varied between 18 and 55 years.

The objective was to analyze the reasons behind cordon pricing rejection and obtaining a willingness to pay from respondents. None of participants knew the core of the discussion although they knew it was about transport. All focus group interviews followed the same

questionnaire and lasted for 1.5 hours each. These sessions were recorded with participants' consent.

Reactions towards pricing may be grouped into categories displayed in table 3. This classification has been developed following partially the content analysis (Wilkinson, 2003) in a way that all participant's thoughts have been categorized according to previous findings in the literature summarised in table 1. Some of these ideas have been mentioned and some of them are completely new. In addition, the number of time each item has been mentioned has been counted. This number highlights the most popular arguments along the focus group: these arguments were ranked according to this criterion.

Table 3: Explanatory variables

Categories	Subcategories	Instances		
		Drivers	Non drivers	Total
Reluctance To public intervention (16)	Non transparent/efficient revenues management	5	2	7
	Its seen like a tax	5	1	6
	We pay too much taxes	1	0	1
	Don't trust government	3	0	3
Equity objections (12)	Spatial unfairness	4	2	6
	Social unfairness- income	5	0	5
	Social unfairness- time table	1	0	1
Lack of effectiveness (9)	Habit	1	1	2
	No reason mentioned	1	1	2
	Lack of concern	2	2	4
	Not ready/ no mature enough	0	1	1
Inadequate (6)		4	2	6
Freedom to move along the street (2)		1	1	2
Lack of alternative modes (2)		1	0	1
Conditional acceptance (9)	In some areas	2	0	2
	Conditional to investment guarantee	2	2	4
	Conditional to a good outcome (time, etc) in the system	2	1	3
Unconditional acceptance (9)	It will work	0	4	4
	Good idea	4	1	5
Acceptability group average		2.31	3.05	

Reluctance to public intervention: Firstly there is a strong rejection to public intervention from two points of view: the most repeated objection is the imputation of lack of transparency in revenues management. Thus, acceptance was conditional to this transparency which, on the other hand was totally unexpected. Others condition their approval to a warrantee that the revenues are going to be well employed.

"I don't trust them [politicians]; we would need guarantees that this money is **truly** going to be spent in improvements in public transport"

"I'd support it if revenues were **truly** used it to improve public transport"

"If it were a **trustable** thing I would pay without problems"

Equity issues: The word unfair is constantly repeated meaning basically three concepts: the first idea is the spatial unfairness which means the perception of the city centre residents as privileged by this system, not only because they do not trip towards the centre -since they already live in the centre- but because city centre residents are located into the highest income groups. Secondly, it is very common to assume that pricing is against the low income groups. However, the most popular focus is the idea that a pricing system privatises the public space and let the richer enjoy it, excluding the poorest.

“I think it’s unfair because it will better off those who live in the city centre...”
“If you are working... it’s not fair because **it depends where you live**”

Lack of effectiveness: Lack of effectiveness is the third most popular opinion. This idea is mentioned without further explanations or, sometimes with two popular arguments: one is the idea of habit, since there is a price it would not constrain driving: people simply pay it. The second is that participants foresee a strong public resistance of citizens, unable to understand and accept this kind of measures, may be thought for a much more modern or sophisticated society.

“... I think it will not reduce the traffic flow neither change drivers habits”

Inadequate: Many respondents consider this measure inadequate for a medium city like Las Palmas due to its size and lack of alternatives. Indeed, the existence of alternatives, such as underground or tram, are considered a basis for legitimating constraint measures.

In addition, rejection because of its opposition to individual freedom to move along the street as a public space that cannot be privatised. Finally acceptance is considered under certain conditions: if the system is properly managed or its revenues are truly invested in financing new public transport infrastructure.

4. Likert scales analysis

The purpose of this section is to analyse and model attitudes, beliefs and perceptions of respondents that, as has been mentioned, have been found the most important factor of rejection of transport policies. Literature in Psychology provides different instruments to measure attitudes; although one of the most used is the Likert scale of items (see for instance Eagly and Chaiken, 1992).

An attitude scale is a list of items, called statements, which produce different responses depending on individual's attitude (Domino, 2006). Respondents are asked to tick five or seven positions between strong disagreement to strong agreement. The main problem is the fact that Likert scales are an ordinal response which cannot be translate into a quantitative variable. However, by adding arbitrary scores associated with each response option it is possible to be treated as an interval (Domino, 2006).

The statements in the Likert test were the result of suggestion from a panel of expert. These items represent five basic concepts identified in the literature and shown in table 6: Apart from the system features (price, time, area, etc) and socioeconomic variables, six factors were selected: perception of the problem and its solution (awareness of transport problems and effectiveness), social environment (the responsibility issue), civil rights (particularly freedom of movement), equity (unfairness of establishing a pricing system), psychological aversion (to pricing, to government intervention) and expected individuals gains. In addition, some items try to capture a style of life favourable to car usage under the hypothesis that patterns of car consumption are the basis of public rejection to restrain measures.

4.1 Result of Likert scale test

Table 4 list the Likert scale results for the 19 items used. Among all these sentences the maximum agree is obtained by the sentence: "I think people use cars too much." (92%); "I think we use cars too much" and: "I am partly responsible of transport problems using my car". It is

outstanding to observe that the highest agreement is related with the excessive use of cars. After these three items emerges awareness of transport problems: “transport problems are very serious in the city” (76,25% agreement). So people seem clearly concern of transport problems and, at the same time, convinced of the origin of these problems is the excessive use of cars. The following item is related to pollution problems, which indicates the notable importance of environmental matters expressed in one of the clearest outcomes: pollution. The agreement to the sentence “there is a serious problem of pollution” reaches 75% of agreement and only 5% of disagreement.

One of the most important ideas related with pricing is the presumably bias against low income groups. Of course, a price system by definition would be more costly for low income groups. What is new here is the unpopular proposal of deliver this scarce resource –the driving space– using a price system instead of queues. This unfairness attribution is very popular seems 68% of respondents agree with the statement: The idea that congestion charging is unfair for the poorer is the next item. (68% agreement) “Congestion charging is unfair for the poorer”. The other item related to redistribution objection is relegated seven positions below with less than 50% of agreement; this is due to the fact that the sentence “Such a measure would be favourable for the richer” is not so clear than the former.

The item “I rather walk ten minutes...” was introduced to test the life style favourable to cars. However, this little walking distance, even though in the context of a small island, is too short to stimulate driving; probably this is the boundary time for walking. As a result, the item become in an apple pie where most of people agree (67,09%), probably because ten minutes is a too much than a reasonable distant for walking.

Again, environmental problems are brought here expressed in a statement about noises. Although 67% of respondents agree about the importance of this problem, noises do not seem to attract supporting as much as pollution, although is still very important.

The idea of expected gains is expressed through the item “congestion charging will make me better off”. Surprisingly 60% of respondents believe that congestion charging will make them better off. The next item is related to private freedom where 54% claim about the freedom of space, just below this sentence we find “there are few pedestrian streets”, again included to test the life style. Here we find a slightly majority of agreement. Immediately after this sentence, with 50% of agreement: “I think I particularly use my car too much” which contrasts with the common responsibility.

From this point, the next statements obtain less than 50% of agreement support, although it does not mean an automatic rejection. “Pedestrians do not have enough space” divides the sample into two halves. Transport as a cause for climate change was, probably a difficult question and many respondents took refuge in a neutral answer (28%). More disagreement (45%) than agreement (37,5%) in effectiveness: most of respondents think congestion pricing is not the solution. “Too many places are more accessible by car” reaches 44% of disagreement and just 31% of agreement which probably shows the differences in respondents’ life styles.

Finally, two statements which receive a high disagreement: a clear rejection of pricing with a 50% of non acceptance and, the item that accumulates more rejection is “more tunnels will be the solution” which is a sort of sentence that represents the idea that solution for congestion is building up more infrastructure.

Thus, we might consider that there is a clear concern about transport problems and, among them, environmental problems; that individuals agree in the excessive use of cars, although they contradict themselves not accusing personally for this excess. Also, one of the statements which drives more rejection is the unfair discrimination against poorer created by a hypothetical pricing. Of course, rejection against pricing is overwhelming. As a conclusion for this section we have seen the importance of three main factors: responsibility –although not individual

responsibility-, awareness of transport problems and environmental concerns. In a second level it is relevant the ethical concerns about pricing. Finally, rejection is clear, although with considerable dispersion.

Table 4: Results for Likert Scale items

Item	%strongly disagree	%Slightly disagree	%Neutral	%Slightly agree	Strongly agree
1. There is a serious problem of pollution	0,00	5,00	20,00	46,25	28,75
2. Traffic noises are unbearable	0,00	8,86	24,05	41,77	25,32
3. Transport problems are very serious in this city	1,25	5,00	17,50	33,75	42,50
4. Transport is the main cause of climate change	5,19	23,38	29,87	32,47	9,09
5. Congestion pricing will solve the problem	20,00	25,00	17,50	30,00	7,50
6. Pedestrians do not have enough space	12,66	29,11	15,19	31,65	11,39
7. Too many places are more accessible by car	13,92	30,38	24,05	20,25	11,39
8. There are few pedestrian streets	6,33	15,19	26,58	31,65	20,25
9. I think we use car too much	0,00	2,53	6,33	45,57	45,57
10. I rather walk ten minutes than drive	1,27	17,72	13,92	26,58	40,51
11. More tunnels will be the solution	16,25	28,75	28,75	22,50	3,75
12. Congestion charging is unfair for the poorer	5,06	6,33	20,25	32,91	35,44
13. Such a measure would be favorable for the richer	6,33	16,46	27,85	31,65	17,72
14. I think people use cars too much	0,00	2,50	7,50	40,00	50,00
15. Streets are an open space...	8,86	18,99	17,72	25,32	29,11
16. Congestion charging will make me better off	11,39	16,46	11,39	35,44	25,32
17. I think I, particularly, use my car too much	7,84	27,45	13,73	29,41	21,57
18. I am partly responsible of transport problems using my car	0,00	3,85	19,23	48,08	28,85
19. I agree with the implementation of congestion pricing	31,25	18,75	18,75	18,75	12,50

5. Factor analysis

Factor analysis is defined as a method to simplified complex set of data such as the matrix of attitude scale we have developed for Likert analysis. These data can be then be reduced to factors that explain the inner relationships between variables (Kline, 1994)

Table 5 displays the rotated component matrix for all individuals. From this table it might be possible to find out six factors as follows:

- Factor 1, accounting for 21,55% of variance was called *rejection based on its ineffectiveness and unfairness*. In this case, the idea is clearer than before: this factor represents opposition against pricing where several ideas converge: very strong is the perception of freedom restriction and the idea that poorer are excluded.
- Factor 2, accounting for 13,47% of variance was called *perception of responsibility* because it contains these items: “People use cars too much”, “we use cars too much” along with “I prefer walking ten minutes rather than drive”. Here is a factor of

responsibility coherent with a life style not totally favorable to car using but represents a type of responsibility not bared into the subject but abstracted in the totality, something like “social responsibility”

- Factor 3, accounting for 11,18% of variance was called *environmental sensitivity*. This factor is clear and composed by pollution and noise complains mainly. In addition, although less significant, climate change is present in the factor along with a general concern about transport problems.
- Factor 4, accounting for 10,47% of variance is a sort of walking factor: those who are worried about the lack of space for pedestrians. For this reason it was called *Pedestrian concern*
- Factor 5, accounting for 8,05% of variance merges “too many places are more accessible by car than walking” with “pricing will make me better off” which seems to express a sort of *acceptance factor*. However its meaning is no so obvious

Table 5 : Rotated Component Matrix: for all individuals

Item	Component				
	1	2	3	4	5
There is a serious problem of pollution in the city	.303	.242	.634	.172	-.296
Traffic noise is unacceptable	.204	.267	.708	.153	-.010
Transport problems in this city are very serious	.023	-.158	.656	.138	.087
Climate change is mainly caused by transport	-.106	.126	.537	-.130	.014
I think a road pricing scheme will sort it out these problems	-.805	-.018	-.149	.139	-.002
Pedestrians do not have enough space	-.019	-.034	.139	.805	.170
Some places are accessible by cars but not by walking	-.158	.067	.192	.221	.733
There are few pedestrians streets in the city	-.102	.161	.046	.857	.092
I do think we use cars too much	.002	.873	.063	.109	.082
I'd rather walk for 10 minutes than take a car	-.273	.660	.118	-.167	-.001
Building more tunnels will be a solution for traffic problems	.385	-.321	.256	-.361	.406
Paying to access city centre would be unfair for the poorer	.761	-.068	-.019	-.021	.005
Such a measure would make richer better off	.739	-.234	.045	-.002	-.090
I do think people use cars too much	-.088	.839	.124	.194	.022
I do think streets are a public space857	-.120	-.037	-.111	-.019
Paying to access city centre would make me better off	.188	.092	-.303	.113	.703
I would accept a road pricing scheme were implemented	-.842	-.012	-.074	-.090	-.152

(Rotation converged in 6 iterations)

It would be wise to split pedestrians and drivers and compare results. Firstly we will analyze drivers in table 6

- Factor 1: *Rejection*, accounting for 24,26% of variance.

- Factor 2: *Responsibility* accounting for 14,58% of the variance, with similar structure than the overall group.
- Factor 3: *Environmental sensitivity*, accounting for 11,99% of variance. In this case environmental concerns are clear: noise and pollution, along with general worries about transport.
- Factor 4: *Pedestrians concerns* accounting for 10,10% of variance.
- Factor 5: *Climate change*, accounting for 7,18% of variance.
- Factor 6: *Car accessibility*. Accounting for 7,13% of variance. Its interpretation is not so clear: drivers might admit that there is an uneven distributed accessibility between cars and pedestrians

Table 6: Rotated Component Matrix: for drivers

Item	Component					
	1	2	3	4	5	6
There is a serious problem of pollution in the city	.077	.199	.749	.250	.297	-.048
Traffic noise is unacceptable	.100	.274	.783	.186	.200	.098
Transport problems in this city are very serious	.038	-.109	.781	-.076	-.288	.148
Climate change is mainly caused by transport	-.031	.179	.079	.026	.872	.013
I think a road pricing scheme will sort it out these problems	-.819	-.104	-.126	.060	-.083	.069
Pedestrians do not have enough space	.182	-.184	.133	.833	.232	-.013
Some places are accessible by cars but not by walking	.059	.074	.162	.132	.013	.931
There are few pedestrians streets in the city	-.014	.209	.142	.831	-.159	.216
I do think we use cars too much	.031	.875	.146	.048	.122	-.008
I'd rather walk for 10 minutes than take a car	-.253	.661	-.019	-.145	.069	-.005
Building more tunnels will be a solution for traffic problems	.506	-.425	.144	-.345	.217	.255
Paying to access city centre would be unfair for the poorer	.772	-.111	-.006	.003	.175	.162
Such a measure would make richer better off	.659	-.330	.214	.020	.038	-.178
I do think people use cars too much	-.034	.845	.162	.123	.068	.106
I do think streets are a public space882	-.057	-.030	.052	-.222	-.085
Paying to access city centre would make me better off	.676	-.037	-.183	.167	-.053	.341
I would accept a road pricing scheme were implemented	-.902	.073	-.138	-.144	.089	-.054

(Rotation converged in 6 iterations.)

Finally, it would be interesting to proceed in the same way with pedestrian keeping in mind that this group is smaller and, as a consequence, its result are not so robust. Indeed, table 7 displays results for non drivers, with six factors describe next.

- Factor 1: *Acceptance* factor accounting for 17,11% of variance: paying will make better off, pricing is the solution
- Factor 2: *Rejection*: Its a sort of rejection factor based on the unfairness of the system (that is the strongest variable). Accounting for 16,43% of variance.

- Factor 3: *Responsibility*, accounting for 14,43% of variance.
- Factor 4: *Pedestrians concerns*, accounting for 12,22%: as we could expect is very remarkable straightforward.
- Factor 5: *More infrastructure*. Accounting for 9,83% contains a desires for more infrastructure and worries about noises not clear: noise in the streets and desires of more infrastructure.
- Factor 6: *Climate change*. Accounting for 9,61%

Table 7: Rotated Component Matrix: for non drivers

Item	Component					
	1	2	3	4	5	6
There is a serious problem of pollution in the city	-.467	.539	.222	-.029	-.205	.499
Traffic noise is unacceptable	-.027	.395	.180	-.041	.710	.121
Transport problems in this city are very serious	-.254	-.191	.060	.398	.486	.382
Climate change is mainly caused by transport	.018	-.105	-.017	-.011	.084	.869
I think a road pricing scheme will sort it out these problems	.785	-.274	.218	.267	-.235	.061
Pedestrians do not have enough space	.099	-.343	.240	.789	-.108	.096
Some places are accessible by cars but not by walking	.010	-.810	.060	.109	-.145	-.079
There are few pedestrians streets in the city	.249	.018	.038	.902	-.067	-.104
I do think we use cars too much	-.025	-.050	.790	.210	.144	-.412
I'd rather walk for 10 minutes than take a car	.305	.064	.810	.015	.117	.275
Building more tunnels will be a solution for traffic problems	-.071	.019	-.138	-.159	.775	-.054
Paying to access city centre would be unfair for the poorer	-.305	.776	-.100	-.019	-.013	-.155
Such a measure would make richer better off	-.308	.694	-.096	-.290	.162	-.175
I do think people use cars too much	-.151	-.220	.814	.149	-.260	.054
I do think streets are a public space ...	-.588	.447	-.249	-.451	.210	.076
Paying to access city centre would make me better off	.695	-.322	.396	-.045	-.124	-.353
I would accept a road pricing scheme were implemented	.893	-.096	-.243	.136	.042	.047

(Rotation converged in 8 iterations)

6. A model with path analysis

The aim of this part was to explain what sort of beliefs, attitudes and perceptions explained rejection or acceptance of this particular transport policy. We counted the number of instances that some opinions were expressed grouping them into different categories. Now these categories are going to enter in a regression model as explanatory variables. This model tries to explain rejection to congestion charging. As a result, the dependent variable will be the degree of acceptance measured as the group mean of the corresponded likert scale item.

Path analysis (PA) is a particular case of structural equation modelling suitable for cases where the casual relationships among variables have a prior hypothesis and all explanatory variables

are observed (Kline, 2006). In addition PA provides a clear picture of casualty through depicting relationships among variables in the model. According to Byrne (2000) structural models allows for using code variables from interview surveys which is actually the case.

We have to consider that each focus group represents here one observation; as a result there are 11 observations. Independent variables are taken from content analysis categories of table 8. Some of them have been merged according to Table 8, displayed bellow. Thus, *Government* represents all objections related to public intervention where have been added “freedom to move along the street”. *Infectiveness* is the convergence of all the thoughts which consider the system inadequate whilst *work* accounts for all positive ideas related to the system.

Table 8: Explanatory variable in the model

Categories	Correspondent category in table 5
Government	Reluctance to public intervention Freedom to move along the street
Equity objections	
Infectiveness	Lack of effectiveness Inadequate Lack of alternative modes
Work	Conditional acceptance Unconditional acceptance

Figure 1 showed bellow represents the PA estimated according to these variables. Beta coefficients are written over the arrows which represents relationships among variables. As expected all variables have negative coefficient, except *work*. According to their significance, it seems that *Government* with 20.25 of t-ratio is the strongest variable against pricing. This PA confirms the importance of ineffectiveness and unfairness founded in the most important factor in previous sector.

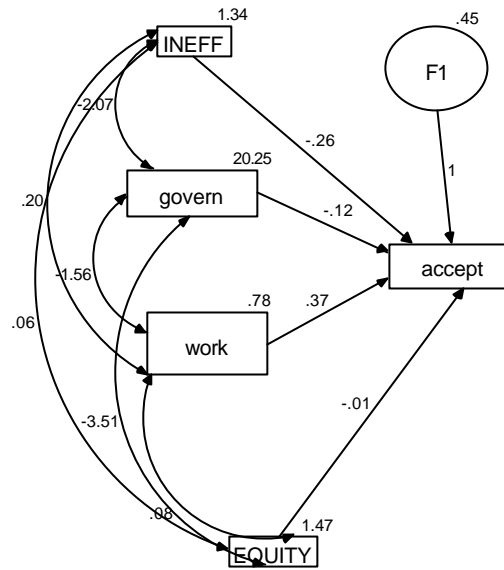


Figure 1: Path analysis

7. Conclusions

Congestion pricing seems to be extremely unpopular. There is a strong rejection from the attributed ineffectiveness but the most popular complain is about the assumption of lack of transparency in revenues management. There is a suspicious of corruption or, at least; participants are fairly convinced of the inefficiency in the system management. This idea reinforces, again, the importance of revenue allocation. However, as we see, it is not only essential a desirable revenue allocation but a transparent, reliable and efficient system's management.

Perception of unfairness is related to the idea that any pricing worse off the low income groups and, in addition, expresses the beliefs that pricing leads to winners and losers as a consequence of resident allocation and trip destination and this seem to be a totally arbitrary criterion which results unacceptable for the public. It is important to understand that pricing itself is not problematic but the perception of an arbitrary tax, not related to scarce of transit space. It is interesting to note that spatial unfairness is interpreted in the opposite way found it in the literature: here, pricing is considered against non centre city centre residents'. This is the result of two convergent ideas: firstly, participants consider that, the richer are, in most of cases, those

who live in the city centre; secondly, city centre residents are benefited by a strong discount and may not have to pay since they live close to the commercial areas and offices (may be feasible by bus or, even walking).

Factor analysis shows the importance of environmental concerns and the discrepancies between drivers and non drivers being the latter more concern about the lack of pedestrian infrastructure and showing more acceptability of congestion charging

PA confirms the main ideas about rejection of government intervention, equity objections and inefficiency of the system. In addition, it is worthy to notice that PA uses results of content analysis as an input linking qualitative and quantitative analysis and reaching similar conclusions than the other approaches.

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