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The consumer-citizen duality: Ten reasons why citizens prefer safety and drivers desire speed

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ABSTRACT

Cost-benefit analyses for transportation projects usually value impacts on safety and travel time through experiments in which consumers of mobility ('drivers') choose between routes which differ in safety and travel time. This approach has been criticized for failing to consider that private choices may not fully reflect citizens' preferences over public goods and means, a concept known as the *consumer-citizen duality*. Recent empirical evidence has established that individuals do indeed assign comparatively more value to safety in their role as citizens than in their role as drivers. Our study aims to provide explanations for this finding by presenting four stated choice experiments in which respondents were asked to make choices, both as citizens and as drivers, between routes that differed in travel time and safety. Subsequently, respondents were asked to provide reasons for their choices. We identify five cognitive and five normative explanations. The *cognitive explanations* suggest that individuals make diverging choices because their perceptions of accident risk differ between the two roles. Drivers will assign a relatively low value to mitigating accident risk because they believe that: (1) such risks are trivial on an individual level; (2) their personal risk is lower than the average risk; (3) their personal risk is controllable; (4) they would not be able to distinguish relative safety levels in real life; and (5) their choices for others are more risk-averse than choices for themselves and, unlike citizens, they are not explicitly evaluating risky choices for others. The *normative explanations* involve that individuals believe that the government should assign more value to safety compared to individual drivers because: (6) as citizen they are more prone to base their choices on social norms which prescribe risk-averse behaviour in this context; (7) governments have a duty of care concerning the safety of the transportation network; (8) drivers have a relatively high degree of responsibility to reduce their own travel times; (9) governments should account for drivers' tendencies to choose faster routes by building safer ones; and (10) governments should ensure the safety of the road network because this allows drivers to choose the fastest route without being concerned about the impact of their route choice on accident risk.

1. Introduction

Cost-benefit analysis (CBA) is used worldwide to support government decision-making on transport projects (e.g. Asplund and Eliasson, 2016; Jones et al., 2014; Thomopoulos et al., 2009). An underlying assumption in standard CBA is that preferences revealed by individuals' willingness to pay in (hypothetical) markets can be used to value the effects of government projects (e.g. Fuguitt and Wilcox, 1999). The postulation that an individual's preferences are restricted by the willingness to pay in (hypothetical) markets is often referred to as 'consumer sovereignty' (e.g. Sugden, 2007). Despite – or perhaps because of – its popularity, various scholars have criticized the use of 'consumer sovereignty' in evaluating public projects. One central theme to their

arguments is that the ways in which individuals balance their own after-tax incomes against the attributes of such projects may be a poor proxy for how the same individuals believe that their governments should trade-off public means and effects of public projects (e.g. Ackerman and Heinzerling, 2004; Hauer, 1994; Kelman, 1981; Sagoff, 1988). The general belief that choices made by consumers differ in some way from those made by citizens is also called the 'consumer-citizen duality' (e.g. Alphonse et al., 2014).

The 'consumer-citizen duality' is widely studied in fields such as agricultural economics and food economics (e.g. Alphonse et al., 2014; Blamey et al., 1995; Curtis and McConnell, 2002; Ovaskainen and Kniivilä, 2005; Tienhaara et al., 2015). Conversely, it has received relatively little attention in transport economics, with a few exceptions.

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For instance, Jara-Díaz (2007) argues that a government's decision (not) to finance a project with tax money should be grounded in *society's* willingness to pay to improve its members' mobility, a sum which may differ from the aggregate amount that individuals are willing to pay for the same improvement. He declares that, "*society has its own budget and its own priorities, and clearly total welfare is not necessarily the simple sum of all users' benefits.*" (p.106). Mackie et al., 2001 make a similar case, arguing that there is no compelling reason why individual willingness to pay for a shorter commute should be equal to the value that society as a whole assigns to the reallocation of that individual's time savings to other activities. Daniels and Hensher (1999) asked two groups of individuals to evaluate the attributes of a proposed urban road project, the M5 East in Sydney. The first group was asked to evaluate a specific trip and its alternatives from a (self-interested) user/consumer perspective, while the second evaluated the project as a whole from a citizen/community point of view. A key result is that individuals did not assign significant value to environmental attributes in either setting. One explanation offered for this is that individuals might not be able to accurately process trade-offs between attributes that are close in self-interest proximity (e.g. costs and travel time) with those that are more distant in self-interest proximity (e.g. environmental attributes). Mouter and Chorus (2016) and Mouter et al. (2017) define the 'consumer-citizen duality' in a different way by arguing that citizen preferences and consumer preferences involve individual preferences inferred from choices within different budget constraints. Namely, while consumer preferences involve an individual's preferences within his/her personal budget constraint (e.g. after tax income and time), citizen preferences involve an individual's preferences regarding the allocation of the government's budget. Mouter et al. (2017) conducted several experiments in which respondents were asked to choose as consumers between two routes which differed in terms of time savings, safety, and after-tax income. For instance, in one consumer experiment respondents were asked to choose – as 'drivers' – between routes which differed in travel time, accident risk and toll costs. Aside from consumer stated choice experiments, Mouter et al. (2017) also administrated citizen stated choice experiments in which individuals were informed that the government had decided to allocate non-specific taxes (general revenue) to the construction of a new road and wanted the advice of the respondents in choosing between two routes that differed in terms of travel time and accident risk. Through these experiments, they were able to establish that respondents who were asked to provide recommendations as citizens assigned substantially more value to accident risk than travel time, as compared to those who were asked to make route choices as consumers of mobility.

These empirical results could have non-trivial implications for the economic assessment of safety policies; namely, such policies will perform much better in a CBA grounded in citizen preferences than in one which reflects consumer preferences. This raises the question of which approach should be used in evaluating proposed government policies which affect both accident risk and travel time. To answer this, it is first important to understand why people hold different preferences in the first place. Explanations for the consumer-citizen duality in the context of accident risk and travel time could provide empirical building blocks for academics and practitioners who have to contemplate, discuss or decide about the question whether or not safety policies proposed by the government should be assessed in a CBA based on consumer or citizen preferences.

Despite the fact that the consumer-citizen duality has been studied in a transport context Daniels and Hensher (1999); Mouter and Chorus, 2016; Mouter et al., 2017), to the best of our knowledge, no efforts have been undertaken to *empirically explain* why individuals trade off the impacts of transport projects differently as consumers and citizens. This paper aims to bridge this gap in the literature through the use of an augmented stated choice experimental study. Beyond simply asking respondents to make binary decisions over preferred alternatives, we also elicited and analyzed the lines of reasoning they relied on doing so.

In line with the findings of Mouter et al. (2017) of a strong consumer-citizen duality in trading off accident risk and travel time, we opted to make these attributes the focus of the choices presented to participants.

The stated choice experiments conducted in our study each consisted of two parts. The first of these was a consumer setting in which respondents were asked to choose between two routes as drivers; the second was a citizen setting in which respondents were asked to make recommendations to the government on which roads to construct. Respondents were also prompted to elaborate on the reasons underlying their choices; at the end of the stated choice portion of the study, they were each asked whether safety was a more important criterion in their recommendations to the government than in their route choices as a driver. Those that answered affirmatively were then prompted to explain why this was the case. In our study we also investigate whether the motivations provided by the respondents are affected by the magnitude of the risks evaluated or the order in which consumer and citizen choice tasks are performed. For the remainder of this paper, we will use the expressions 'driver' and 'consumer (of mobility)' interchangeably.

This paper proceeds as follows: Section 2 provides a brief discussion of the literature regarding possible explanations for the consumer-citizen duality in a transport context. Section 3 describes our methodology and the process of data collection. Section 4 presents our results. Section 5 provides a discussion. Section 6 lists the policy implications of our study. Finally, section 7 presents the main conclusions.

2. Literature review

A key finding of the study by Mouter et al. (2017) was that individuals tend to choose the fastest route as drivers while recommending that the government build the safer route instead. The literature offers several potential explanations for this result. This section surveys these explanations because it allows us to identify the extent to which explanations respondents mention add to the literature. In Section 2.1 we discuss four cognitive explanations, which hold that respondents make different trade-offs between travel time and safety because they perceive the associated risks differently as drivers than as citizens. In addition, Section 2.2 addresses two normative explanations, according to which the government *should* assign more value to safety than do individual drivers.

2.1. Cognitive explanations

The first cognitive explanation for the discrepancies between the choices of drivers and citizens is that the former entails evaluating tiny impacts on individual mortality risk, while the latter explicitly requires participants to choose the number of traffic deaths on a route. More specifically, if a driver chooses a route with 1 additional traffic death per year, this implies acceptance of an increase of personal mortality risk by 1 in 29,000,000, whereas in the citizen experiments this implies that every year one additional citizen will die in a car accident. Ackerman and Heinzerling (2004) argue that it is likely that people will ignore the 'meaningless figures' in the driver experiments, while in a citizen context they realize that their choice will directly influence how many road users die in a given year. The fact that their decision might contribute to saving a human life can encourage respondents to recommend the safest option. A corresponding explanation follows from prospect theory (Kahneman and Tversky, 1979), which establishes that people are limited in their ability to comprehend and evaluate extreme probabilities. There is a large body of literature which demonstrates that individuals tend to either overweight or discard extremely unlikely events. Furthermore, in a situation where an event is possible but not probable, people's preferences are generally less sensitive to variations of probability than expected utility theory would dictate (e.g. Kahneman and Tversky, 1979; Kahneman, 2011). Hence, prospect theory would predict that individuals will choose for the fastest route in the driver choice tasks because they might (1) discard low probabilities and therefore ignore safety in their

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