UNDERSTANDING URBAN MOBILITY CHOICES. A ROMANIAN FIELD STUDY

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Abstract
The scope of this paper is to present potential directions for improving the design and implementation of evidence-based practices on policies involving behaviour change related to travel choices in Cluj-Napoca. Cluj-Napoca is currently implementing a local strategy focusing on the transition to sustainable mobility. This is aimed to decreasing CO_2 emissions, as well as influencing resident's behaviour to opt for alternative transportation modes and discourage car usage. In the first section, the paper explores why there is growing evidence that both standard economics, as well as behavioural economics approach are necessary for achieving public policy objectives of transition to sustainable urban mobility. The second part explores the design of a field experiment in Cluj-Napoca aimed for assessing if the desired behaviour (less car usage) is easy to adhere to. The final section discusses the results of the field experiment and offers considerations on how local policy makers should integrate these type of surveys in their evidence-based approach on changing travel behaviour of city residents.

Keywords
Urban mobility; choice architecture; behavioural insights.

JEL Classification
R11, R41, R48

Introduction

Urban congestion throughout the European Union (EU) maintains high values (European Commission 2016), in addition to the already worrisome situation where road transports generate 71.7 % of the EU's greenhouse emissions (European Commission 2019). In this context, the new European "green deal" seeks to reduce 90% of greenhouse emissions in transport by 2050. This policy target is an ambitious continuation of the European Union's strategy (Europe 2020) objectives, that proposed for the period of 2014-2020 a reduction of greenhouse gas emissions of 20% compared to 1990. Monitoring the achievement of this goal is still under way.

The European Commission has developed a guidance for local and national authorities in all member states to be followed in order to support the European Union's effort to transition to sustainable mobility. The Sustainable Urban Mobility Plans (SUMP) represent a roadmap for strategy development concerning urban mobility (Rupprecht consult (editor), 2019). Moreover, SUMPs are required at local, regional and national level as a precondition to access any European structural funds related to road infrastructure and mobility.

Romania, as a EU member state, has supported the development of its first SUMPs for the 7 most important urban areas. To this end, it has contracted external expertise from the European Bank for Reconstruction and Development to support the country's most important 7 cities to develop their first SUMPs.

Cluj-Napoca has developed its first SUMP for the period 2016-2030, acknowledging that it needs to reduce car usage in the city and its metropolitan area (ARUP, 2015). The Cluj-Napoca SUMP does not contain information on commuter patterns and behavioural insights on travel choices of Cluj-Napoca residents. There is an ever growing number of studies noting that a transition to sustainable mobility is unlikely if technological improvements and changes in the built environment are not combined with behavioural change (Avineri, 2012; Metcalfe and Dolan, 2012);.

This is why the objective of this paper is to present potential directions for improving the design and implementation of evidence-based practices on policies involving behaviour change related to travel choices in Cluj-Napoca. The first part of the paper explores the standard and the behavioural-approach of influencing travel options. The second part of the paper describes the field experiment designed to understand whether Cluj-Napoca needs now the standard or the behavioural-approach for influencing less car usage, in line with sustainable mobility goals. The third part presents the results and conclusions of the field experiment.

Literature review

Travel can be regarded as a series of short term choices on how to reach destinations and participate in daily activities. Both availability of travel options, as well as urban form, are significant determinants for how individuals set up daily routines of departure time, route choice, destination and travel mode (Axhausen and Gärling, 1992; Ettema and Timmermans, 1997; Haegerstrand, 1970).

The standard approach to influence a travel option over another in order to reduce congestion has been to influence the demand. For example, road pricing and parking policy can make car usage expensive and discourage drivers to take this option into consideration. The caveats of these interventions are however growing concerns on social equity (Giuliano, 1994) and acceptability (Eriksson, Garvill, and Nordlund, 2006). Other transportation demand-based solution includes land use planning policy, proactively trying to decrease car daily travels through promotion of a compact way of living, where housing, work, day-care, schools and other amenities are available within a walking radius or accessible by public transportation or alternative transportation (bikes, scooters etc.). The pre-existing structure of some cities, especially historical ones, makes this solution particularly hard to be considered.

Because of the limitations of each of these policy interventions, in recent years, a growing number of studies have indicated the importance of interventions focusing on behavioural change towards the transition to sustainable mobility change (Abrahamse et al., 2009). A few studies in transport studies literature have begun to explore the link between transport and subjective well-being (SWB) (Abou-Zeid and Ben-Akiva, 2011; Duarte et al., 2010; Jakobsson Bergstad et al., 2011). While results are inconclusive on the potential effect of travel on people's overall evaluation of their lives, commuting from home to work has been shown to be one of the least enjoyable activities during the day (White and Dolan, 2009).

Thus, the choice of travel mode is also influenced by attitudes towards the travel alternatives. Work related journeys are mostly judged by their utilitarian attributes, while for leisure journeys both utilitarian and affective factors are equally important (Anable and Gatersleben, 2005). Yet, cars are a typical conspicuous good that signal wealth (Dargay, 2001; Hirsch, 1978), and provide wider psychological and social benefits, such as mastery, self-esteem, feelings of autonomy, protection and prestige (Ellaway et al., 2003; Mokhtarian, Salomon, and Redmond, 2001; Steg, 2005). These affective factors give the car a comparative advantage over public transport (Steg, 2003). Conversely, Stradling, Anable, and Carreno (2007) found that satisfaction with public transportation depends on factors such as cleanliness, privacy, safety, convenience, stress, social interaction, and scenery. In addition, Abrahamse, Steg, Gifford and Vlek ,(2009) reported that positive feelings associated to the car reinforce its use, while negative ones such as guilt and disappointment predict intentions to use public transport. Personal norms remain however an important determinant of car-use reduction (Nordlund et al., 2003).

Living the present moment at the expense of tomorrow, also known as hyperbolic discounting, might also cause people to overlook certain long-term outcomes which might require them to make a sacrifice in the present (Laibson, 1997). People's saving behaviour falls under this category (Ianole, 2014) as well as changing a present behaviour, on account of a distant challenge, such as environmental concerns of car usage (Hardisty and Weber, 2009).

Commitment to a certain travel mode might also be determined by habits. Owning a car or having a monthly pass for public transport are pre-commitment mechanisms to a particular travel mode (Simma and Axhausen, 2001). Such commitments inform past behavior (habits) and might also incur several biases, such as status quo or endowment effect, when making new decisions for travel mode for a new short distance trip or connected activities (parking). Individual reference point might also explain the participants' choice for the particular mode of transport. Reference points matter in shaping people's preferences (Ianole, 2017) and can be very important in modelling and predicting behavior in transport networks (Avineri, 2006). Moreover, public transport users have been found to be more risk adverse than car users with regard to expected travel time and travel time variability (Bates et al., 2001; de Palma and Picard, 2005; Noland and Polak, 2002).

Methodology

Before understanding Cluj-Napoca's residents biases towards voluntary reduction of car usage and other measures to support the transition to sustainable mobility, we wanted first to understand what transportation method is the most efficient, time-wise, for daily commutes in the city.

We developed a field experiment to measure the efficiency of four modes of transport: public transport, bike, private car and walking. A team of 22 students from the Sociology Department of the University Babes-Bolyai was asked to collaborate for this field experiment as part of their applied research projects. The students were split into teams and asked to cover certain origin-destination routes using the bus, the bike, private car and walking. Each team covered 3 different origin-destination routes during the morning rush hour.

The design of the field experiment followed this structure:

-   Choice of origin and destination points. A popular destination point in the city center of Cluj-Napoca was chosen to match the regular morning commute of parents with children. This was "Nicolae Balcescu" primary school and high school, one of the best-rated educational facilities in the city, that accommodates both primary education and high school education levels. Although for primary school the law states that only children living in close proximity of the school are eligible for enrolling, the reality shows that pupils live at significant distances from the school. Thus, 21 points signalled by representatives of the school as the neighbourhoods where most of the pupils live were chosen as origin points.

- Choice of time and date. The morning rush hour was chosen (between 7 and 8 AM) and the field experiment was conducted on Friday, June 8th, 2018.
- Data measurement. Students were asked to mark on an observation sheet the time of their departure and arrival.
- Availability of modes of transport. To conduct the experiment, a ridesharing company for Cluj-Napoca borrowed us three cars. Students that already had valid public transportation passes were assigned for the bus routes, students willing to ride a bike were assigned the cyclist routes and students comfortable with walking tested the pedestrian routes.

Results

The diagram below summarizes the results of our field study. In the first column, it highlights the number of minutes with which the car is more efficient to reach the destination in comparison with the bus (black scales). The second column highlights the number of minutes with which a bike can reach the destination in comparison with the bus- black if it is more efficient, red if it is not. The last column highlights the number of minutes needed to reach the destination walking in comparison with the bus- black if it is more efficient, red if it is not.
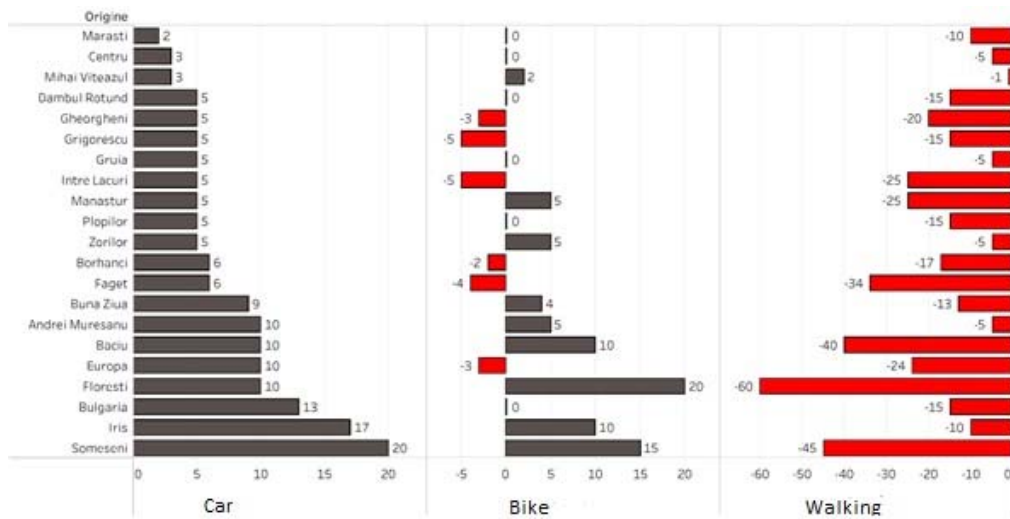
Fig. no. 1 Comparative timings relative to the bus for reaching the "Nicolae Balcescu" High school between 7-8 AM starting from various neighbourhoods in Cluj-Napoca.
Source: Vrabie, Anamaria, Norbert Petrovici, Titus Man, and Codruta Mare. 2018. 'Pactul de Mobilitate'. Cluj-Napoca: Divizia de Inovare Urbana Cluj-Napoca.

The main conclusion revealed by the field experiment are:
1. The commute by car is faster than the one with the bus. No matter the original neighbourhood the departure, in rush hour traffic conditions, reaching the destination was faster by car, rather than public transport. Cars were faster on average with 7.5 minutes than the bus, making this transportation mode the most efficient (time-wise) way for commuting.
2. For short distances, bikes provide the same conditions for commuting as buses. On longer distance however, one can reach the destination point faster than the public transportation. The ride is however more dangerous, as there is still insufficient dedicated infrastructure for bike lanes in the city.
3. Walking scores as the slowest transportation mode, as one could expect, especially on longer distances.

Conclusions

The scope of this paper was to present potential directions for improving the design and implementation of evidence-based practices on policies involving behaviour change related to travel choices in Cluj-Napoca. Cluj-Napoca is currently implementing a local strategy focusing on the transition to sustainable mobility. This is aimed to decreasing CO_2 emissions, as well as influencing resident's behaviour to opt for alternative transportation modes and discourage car usage.

In order to effectively achieve behaviour change, public policies need to have documented evidence that the behaviour they are expecting to influence has the enabling environment to be followed. In other words, that it is easy and accessible to adhere to the desired behaviour. This is why, this paper focused on verifying which transportation mode is currently most efficient (time-wise) in Cluj-Napoca. Based on the results of the field experiment that informed the current paper, the car is still the fastest transportation means in Cluj-Napoca, while public transportation lags behind, especially on certain routes. Until the implementation of this field experiment, Cluj-Napoca did not have such comparative data in conditions of real traffic available, matching real commuter routes that residents are likely to engage in daily. It is important to note however the current limitations of the field experiment. In this study we did not take account the time required to find parking, which generally adds to the overall time of using the car as a transportation means.

Changing habits around travel choices required consideration on many behavioural aspects such as personal reference points, attitudes, commitments, but most importantly, needs to be able to deliver on the promise that the proposed alternative is better. In our case, that public transportation is a faster and more efficient way to commute.

Surveys as the one presented in this paper should be done on a regular basis by local policy makers, in order to be able to assess in real time the complementarity of other policy interventions, such as increasing parking tariffs, making priority lanes for buses or extending infrastructure for (alternative) transportation. Only in this way a strengthen capacity for evidence-based practices on policies aiming for behaviour change related to travel choices can be supported.

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