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Session VI: Data and intersectionality new methods and approaches

10.45-11.00/ 11.45-12.00 Presentation 24: Thursday, 18th November 2021

Gendered perceptions of new mobility services

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Abstract

Transport systems´ infrastructure and provided services affect people´s mode choices and define the users´ transport experience. This study focuses on the exploration of how perceptions of existing and new transport services vary among men and women and which potential measures can improve the users´ experiences. A survey is designed and replies from 1193 citizens of three European cities is collected. The data analysis aimed to indicate in which areas the perceptions of men and women differ. The results indicated that men have more trust in new technologies that can be used in mobility services such as autonomous vehicles while women have a positive attitude towards the inclusions of measures that can enhance security in the passenger experience, especially in the public transport sector.

Introduction

Transport systems' infrastructure and services affect people´s mode choices and define the users' transport experience. When dealing with gender issues in transport, although research affirms the importance of inclusive mobility as an essential factor for the development of societies, transport services and policies still do not equally respond to women's and men's mobility needs (Thynell, 2016). The lack of detailed gender statistics and the lack of robust data characterizing the experiences of women (Gauvin et al., 2019) have been identified as main barriers to the adoption of more gender-equal policies. Providing an environment in which male and female transport users would be equally satisfied is a fundamental point to sustainable transport services. This study focuses on the exploration of how perceptions of existing and new transport services vary among genders and which potential measures can improve the users´ experiences. Data in three European cities are collected and analyzed through statistical tools and insights are provided on the aspects that should be improved so

that female users´ experiences are ameliorated. The current work is part of the H2020 European project TInnGO (Transport Innovation Gender Observatory), aiming to create a framework and mechanism for a sustainable game change in European transport concerning gender and diversity (Pirra et al., 2021).

Theoretical background or state of the art

The social role that people undertake influence their mobility habits. In terms of gender, women's mobility is generally characterized as more problematic than men's, often due to the complexity of the time-space arrangements women face (Jain et al., 2011). Studies show that men often have linear and standard travel patterns to and from the workplace, without interruptions. In contrast, women frequently have shorter travel patterns, involving other destinations besides the workplace to cover other personal or social needs: schools, hospitals, and health centers, shopping centers, etc. as an outcome of the multiple responsibilities, reflective of the role they have in societies, they need to undertake in their daily lives. The experiences across the modes also vary.

Despite bikesharing becoming increasing popular all around the world, empirical data reveal that, though the gender gap may vary across bikesharing programs, bike share users are disproportionately male (Wang and Akar, 2019). Women seem to be more influenced by the environment and the infrastructure (Wang and Akar, 2019). At the same time, the bicycle proposed by the provider can lead women to refuse to join this service due, for example, to its weight (Ma et al., 2020) or the absence of baby saddle (Zhang et al., 2015).

While talking about shared mobility, it is worth investigating the female perception towards car sharing. In general, the take-up of this mode is greater among men than among women (del Mar Alonso-Almeida, 2019), and the costs of car sharing compared to car ownership play a more significant role for female users than for male users (Kawgan-Kagan and Popp 2018). As also derived when investigating bike-sharing, the main limits in using shared mode stand in the difficulty while traveling with children, given by the absence of child seats. So, as women are commonly in charge of escorting duties, they seem to be more affected by this aspect in their mobility choice.

As far as new technologies are concerned, Ortega Hortelano et al. (2019) report that women hold less favourable attitudes towards emerging technologies and perceive higher risks than men. This facet may be explicitly linked to the characteristics of new technologies and how they impact different individuals, but also to a more general concern about robots. According to Bansal et al. (2016), it could mean that women are more risk-averse and tend to use new technologies once these are operational and consolidated. While considering Electric Vehicles, various works in the literature reveal that the female interest towards them is lower compared to the male counterpart.

Overall, differences among men and women have been reported in past studies. This study employs this knowledge to identify the specific aspects of transport modes and systems in which these differences are seen.

Methodology and results

The objective of the current work is to explore gendered perceptions of new mobility services and interventions in current systems. To achieve this objective, a survey is designed to collect information from users (Pirra et al., 2021). For all the analyzed transport aspects and future services, the respondents were asked the level of agreement on an 1-5 point Likert scale (1totally disagree and 5-totally agree for positive answers). Although 5 and 7-point likert scales are widely used and accepted (Krosnick and Tahk, 2013), a 5-point likert scale is chosen for this study because it targets a data

collection to the general population (Srinivasan and Basu, 1989) and because it would facilitate respondents compared to 7-point scale.

The survey was distributed between November 2020 and January 2021 in three big European cities, Valencia, Turin and Paris. To ensure consistency in the collection method, all cities followed the same strategy and collected information through web-based survey dissemination campaigns through the project´s and the participants´ social media channels, platforms and networks and to enhance the dissemination and increase the number of completed surveys, low-value prizes were given to each participant at subcontracted specialized companies. In all cities a representative sample of the population above 18 is involved in the data collection, reaching a total of 1193 replies: 190 men in Valencia, 182 women in Valencia, 204 women in Turin, 208 men in Turin, 204 women in Paris and 205 men in Paris. The gender and age of the participants were the variables that controlled the collection process in order to approximate the statistics presented in Malandrino and Berman (2020) and CIVITAS (2020).

First a Principal Component Analysis was run with all data using Varimax rotation for the aspects to be analyzed for gender differences later on. The results indicated the consistency of 5 different components that explain 67% of future trends that could improve transport services (KMO = 0.948). The identified components were related to new shared mobility services, interventions in public transport and the transport network and finally, perceptions on autonomous vehicles.

Out of the 14 aspects of shared mobility services analyzed, the respondents stated that taxi services with female drivers would be more welcome in Valencia and Paris by women while in Turin women would prefer to have a broader coverage of dock stations for shared bicycles. All the rest of the analyzed characteristics of future transport systems were not found to be differently perceived by men and women.

Figure 1 presents the statistics of the replies of the respondents in the three cities to questions related to measures that they believed that could improve the public transport services. Security-enhancing measures could make a difference in the cities of Valencia and Paris while such security measures were not perceived differently from men and women in Turin. For example, the use of telephones and alarms that could allow users to indicate that they are in danger need help (in and out of vehicles) and camera surveillance, located either at stops/stations and in the vehicles was considered more useful by women. The preference for services related to communication means in case of emergency were also slightly higher rated compared to other types of interventions. Also, women rated higher the utility of the provision of special fares for those passengers of public transport that perform various tasks per day using public transport probably due to the execution of various tasks related to both professional and personal tasks on a daily basis.

Figure 2 focuses on perceptions over AVs. The trust of women in AV technology seemed lower especially in the case of Paris while in the other cities the perception of the respondents was equally low indicating that potential benefits of AVs are still not entrusted by the population. On the contrary to the previous aspects, the expectations of the respondents over the beneficial role of AVs on mobility experiences and productive use of travel time were higher for men agreeing with previous research results.

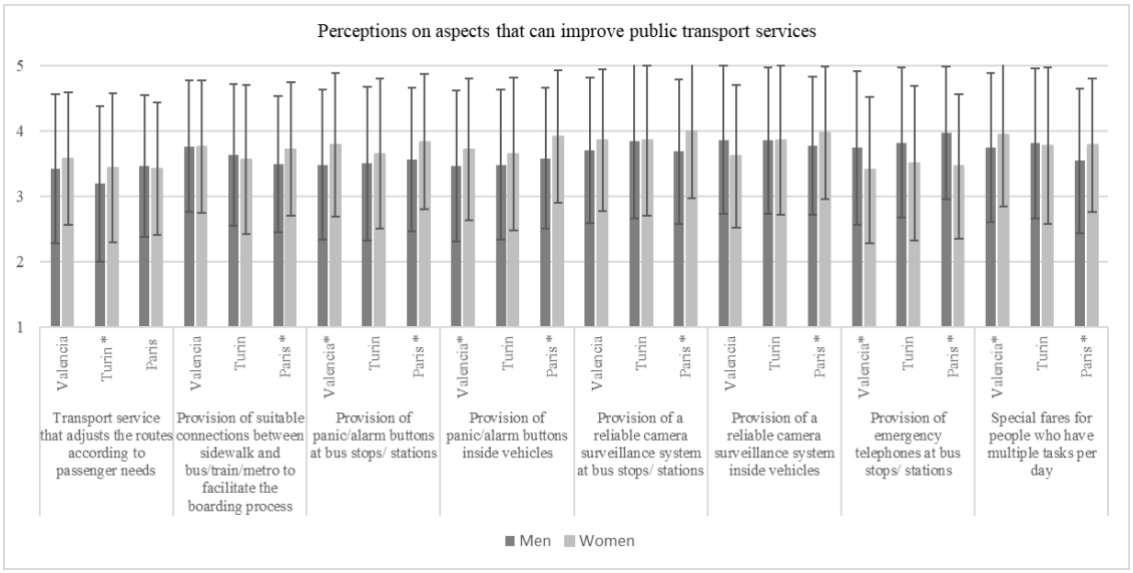

Figure 1. Mean values and standard errors of the perceptions of men and women on technological interventions in public transport

For all the remaining aspects and for the transport network component, no differences were found among the male and female respondents in the three cities. Also, no differences were found for the availability of schedules information either in smartphone applications or bus stops and stations which indicates that there is alignment in the perception of information sharing sources from both genders with satisfactory mean values. In addition to that, there was alignment in the preference of having suitable connections among all mode infrastructure showing that the need for the facilitation of multimodality is commonly perceived by men and women. These aspects were some of those which received the highest mean scores calling for the attention of transport operators. Other aspects that received high scores and form possible interventions that could help improve the experience of public transport users are the provision of special fares for people who perform multiple tasks during a day. Although the prices of public transport are not part of this survey, this result could be an indication of low levels of satisfaction with the value for money that passenger have for public transport. Finally, it was shown that use of surveillance cameras in the transport system is desired intervention with a moderate mean for all cities and genders.

The lowest mean values were given to the statements related to the provision of taxi services with female drivers only destinated to women for all cities. Also, the perception on the need for transforming docked shared bicycles systems in dockless systems was low in all cases. Contrary to what was expected based on the insights of the literature, there were no differences among men and women in the assessment of the space available in vehicles for equipment. However, for all genders and cities, the level of agreement with increase of space dedication for children or trolleys/ wheelchairs in public transport was moderate to high with mean values ranging from 3.16 to 3.59.

In what concerns AVs, the replies obtained from the city of Torino were assigning higher rates in the utility of AVs compared to the other cities. The expectations on autonomous vehicles of the citizens of the three cities coincided, independently of gender, in what concerns data protection in the use of AVs.

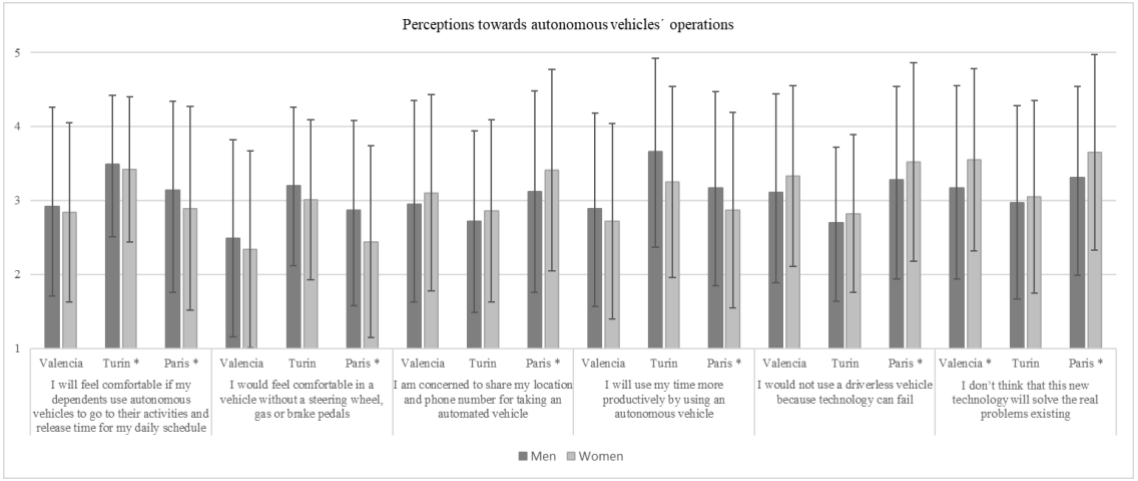

Figure 2. Mean values and standard errors of the perceptions of men and women on autonomous vehicles

Conclusion

Current transport systems need interventions to enhance their quality of service and improve the passenger experience. New technologies and changes in current operations can have positive results to this direction. However, it is not explored how people perceive such interventions and if they differ between men and women. In this study around 1100 replies from citizens of three European cities were collected to address how men and women perceive changes in current transport operations and the inclusion of new technologies. Interventions in transport systems are summarized by five components of future trends which are then analyzed based on the differences they present in the perception of men and women.

Regarding shared modes, few differences were found contrary to what was initially expected and assumed based on the literature review. However, the results of this study corroborate previous research indicating that men trust more autonomous vehicles and have a higher appreciation of their potential benefits in mobility experiences in all the cities under analysis. In what concerns public transport, new insights were obtained highlighting that women have a positive attitude towards the inclusions of measures that can enhance security in the passenger experience, such as camera surveillance and panic alarm buttons. The enhancement of multimodality through information and infrastructure integration was also concluded from the collected information but in a similar way among men and women.

In general, the city that demonstrated fewer differences among men and women was Turin while Paris was the city where differences in many aspects were found. The different role, activities and mix of population in these two cities may be the reason behind these differences. Paris, as well, covers a larger geographical area compared to Turin allowing for higher diversification in the characteristics of the transport system assessed and analyzed in this study. Future work aims to explore the designation of citizen clusters based on the collected information.

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11.00-11.15 / 12.00-12.15 Presentation 25: Thursday, 18th November 2021

Analysing the mobility patterns of urban transport users in five European cities

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