

# Impact of Gender-Based Violence (GBV) on Women's Daily Travel Decisions: The Case Study of Cairo

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## Abstract

Gender-based violence (GBV) on public transportation (PUT) is a global phenomenon that many women face daily. This phenomenon impacts women's mobility decisions, ranging from changing trip mode and route to cancelling the trip or even in some cases resigning from work. PUT is a vital component of urban life by providing the means of accessibility and mobility. Violence towards women on PUT often results in negative impacts on women's life, such as loss of opportunities, loss of accessibility, and extra financial burdens. In this research, we discuss the issue in the context of data from a survey collected recently in Cairo, Egypt.

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## Introduction

According to the World Bank population data, women represent almost 50% of the world's population (World Bank, (female % of total population), 2019). Women typically have specific travel patterns that differ from men, reflecting the different responsibilities they have to take in their daily life and the different mobility challenges they face. Women are culturally expected to spend more time fulfilling basic family obligations, such as domestic work, and elders and childcare (Blumen, 2000; Jiménez Ruiz & Moya Nicolás, 2017; Sánchez et al., 2014). The societal acceptance of unshared extra responsibilities has forced women to perform more complex, shorter, multichain, multi-purpose travel patterns when compared to men, especially in multi-person households (Fan, 2017; Patterson et al., 2005).

According to Patterson et al. (2005), in Montreal, Canada, women tend to perform more frequent, shorter trips compared to men. In Spain, the same female travel pattern holds, where women perform more trips regardless of their reason compared to men (Sánchez et al., 2014). Moreover, while females statistically take shorter trips to work, they spend the same travel time as men (Sánchez et al., 2014). A study by the International Transport Forum (ITF) in eight cities in Europe and Asia (Auckland, Dublin, Hanoi, Helsinki, Jakarta, Kuala Lumpur, Lisbon, Manila) revealed that women tend to travel shorter distance trips compared to men, travel more than men for non-work-related purposes, and those trips are more likely to take place outside the peak hours (Ng & Acker, 2018). Furthermore, the association of shorter trips with women was observed in the UK for all travel modes (Root et al., 2000). The same travel pattern is observed in Rajkot, India; however, an increase in women's income is linked to increased travel distance, but still shorter than their male counterparts (Mahadevia & Advani, 2016). Another important aspect of travel pattern is the mode choice, where women tend to prefer PUT over cars, such as the

case of Ahmedabad, India (Mahadevia et al., 2012), Sweden (Polk, 2004), USA (Rosenbloom, 2006), and Germany (Vance & Iovanna, 2007).

## Motivations and Study Design

One of the most difficult challenges women face, while using PUT, is GBV. GBV is not a location-specific problem. Both developing and developed cities suffer from GBV on PUT: cities like Paris, France, New York, US, London, UK, Tokyo, Japan, Moscow, Russia, Lima, Peru, New Delhi, India, and Jakarta, Indonesia, feature some of the world's most dangerous PUT systems for women, according to a survey performed by Thomson Reuters Foundation (CNN, 2014). The same survey states that Cairo, Egypt, is expected to be in the top five most dangerous systems; however, conducting a survey at the time of the study was not possible (CNN, 2014). Women experience different forms of GBV, according to the same survey in New York, Paris, Lima, New Delhi and Jakarta, half or more of the women have suffered verbal harassment. In Moscow, Jakarta, New Delhi and Tokyo, at least half of the women have suffered physical harassment. Table 1 shows the rates of incidence of GBV forms reported by different surveys for the aforementioned places. GBV against women on PUT influences the perception of safety. According to Ait Bihi Ouali et al., 2019 based on large scale customer satisfaction data from 2009 to 2018 from 28 world cities, there is a significant gender gap in the perception of safety, in which women are more likely to feel unsafe than men. Furthermore, more acts of violence tend to decrease the feeling of safety from women. The design and operation of PUT overlooking the gender differences provide a system that tends to hinder women's access to opportunities and might end up contributing to the social impacts caused by gender inequality.

In this study, we consider the EU definition of GBV, where it is defined as any act of violence directed towards any

person based on their gender. Women and girls are more likely to be subject to GBV, which likely results in physical, sexual, psychological, economic harm (What is gender-based violence? n.d.).

According to Quito's new urban agenda (UN Habitat III, 2016), cities should be a safe, healthy, inclusive, and secure environment that enables people to participate in urban life without the fear of violence. Cities should focus on enabling women and girls, who are more vulnerable targets for violence, in civil participation and civil rights without the loss of economic opportunities. Such a vision needs to be achieved by facilitating and providing efficient infrastructure and sustainable age and gender-responsive modes of transit. Considering the UN stated targets (UN Habitat III, 2016), there is a need to gain deep insights into the GBV phenomena on PUT to be able to produce evidence-based policies.

## Methodology

The first stage of the survey was a pilot project that was conducted in Cairo in June and July 2019. The pilot consisted of three main parts. The first part investigated the different sociodemographic attributes of the interviewee. The second part investigated the general travel behaviour, and the last part explored the different PUT service characteristics that affect the user satisfaction, and their importance from the users' point of view following the guidelines of the handbook for measuring customer satisfaction and service quality (TRB, 1999) and similar to Tyrinopoulos and Antoniou (2008). The evaluation of importance and satisfaction was done on a Likert scale of five points, where one corresponds to completely dissatisfied, five to completely satisfied, while three denotes indifferent. The questionnaire was

Place	Type of GBV	Incidence reported	Source
UK (London)	Sexual	11%	Transport for London (2015)
Brazil (São Paulo)	Sexual	49%	Datafolha (2014)
France	Sexual	87%	FNAUT (2016)
US (New York)	General harassment*	75%	Kaufman, Polack, and Campbell (2018)
Japan (Tokyo)	Sexual (groping)	25-50%**	Shibata (2020)
Russia (Moscow)	Physical	50%	Thomson Reuters Foundation (2014)
Peru (Lima)	Sexual	78%	Martinez, Mitnik, Salgado, Scholl, and Yañez-Pagans (2020)
India (New Delhi)	Sexual	58%	Madan and Nalla (2016)
Indonesia (Jakarta)	Sexual	64%	Kirchhoff et al. (2007)

\* According to the survey, 75% of female responses indicated some form of harassment or theft while using public transportation.

\*\* The study conducted a survey among students and approximately 25% of women have experienced groping in the past three years, it also compares with other studies in which the share varies up to 50%.

**Table 1:** – GBV against women reported by different survey studies

A two-stage survey is conducted in Cairo, Egypt. Cairo is the capital of Egypt, and the most populous city in both the Middle East and North Africa (MENA) and the Mediterranean areas, one of the world's ten Megacities with a total population of 20 million inhabitants (United Nations Department of Economic and Social Affairs, 2018). Like other southern megacities Cairo suffers from the problems of over-crowdedness, daily traffic congestions, and insufficient public transportation supply (El-Hamamsy, 1998). The main goals of these surveys are to investigate the phenomenon of GBV in PUT, to evaluate the factors impacting users' satisfaction from PUT, and to understand the different problems associated with GBV from the different users' (and especially female's) perspective. This survey aims to assist planners and decision-makers to take the required measures to reduce and eventually eliminate the GBV phenomenon and increase the users' satisfaction from PUT. The proposed analysis of the survey will be done using two methods: I) Survey sample data will be analysed to understand the different travel patterns and their association with the different demographics, II) Behavioural models will be specified and estimated to investigate the factors affecting travel decisions. The current paper relies mainly on simple analytics from the survey responses for the derivation of conclusions; more detailed model explorations are planned as next stages of this analysis.

implemented using open software (Limesurvey.com). A total of 214 complete responses were collected. This analysis has the objective of understating the interplay of perceived satisfaction and importance and how different are the results from the gender perspective. The comparison between male and female travellers enables grasping how the service is perceived differently. A subsequent Factor Analysis (FA) is performed with and without gender perspective to analyse the attribute loadings for the main variables related to importance and satisfaction.

The second stage survey (which is planned for the second half of 2020) will target a sample size of 1000 respondents, and the results of this pilot study will guide its design. The second survey will be collected through face-to-face interviews targeting only female PUT users in different locations around PUT hubs and locations of harassment incidents (reported using the available digital platform for harassment incidents map, Harassmap.org). This survey will explore additional GBV indicators related to different categories of harassment, such as physical, verbal, and sexual harassment.

## Pilot Results

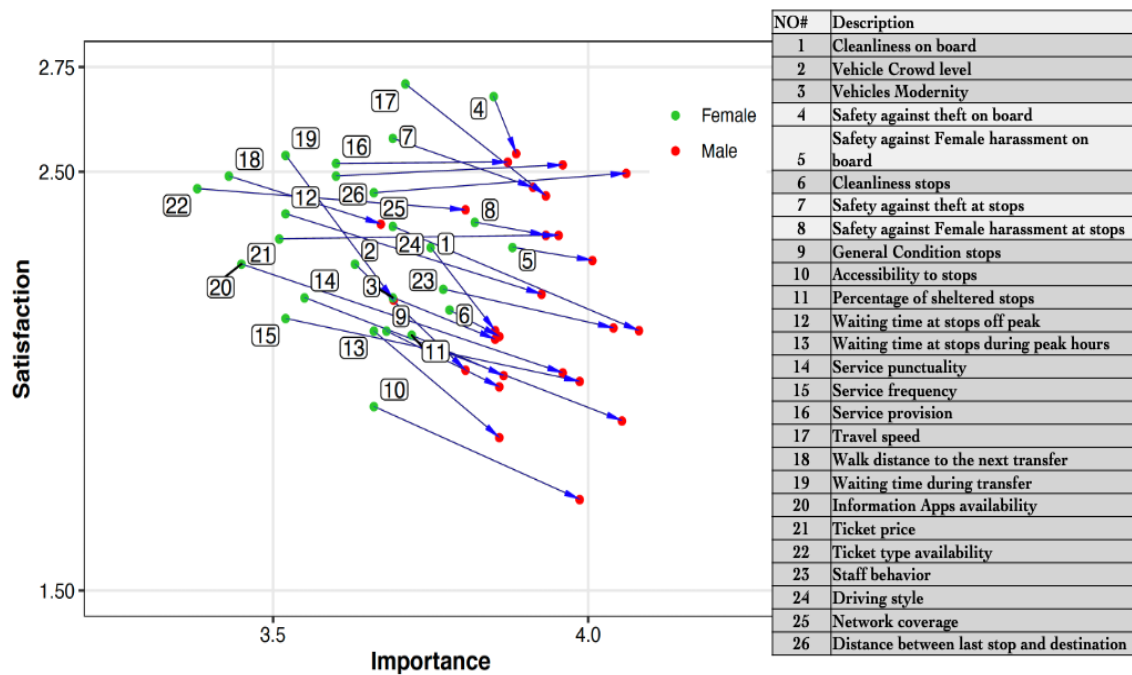


Fig. 1: Importance vs. satisfaction for PUT characteristics

	Importance	All	Male	Female
Security of female users against harassment		0,584	--	0,669
Security of female users against harassment at stops		0,734	0,732	0,776
	Satisfaction			
Security of female users against harassment		0,71	0,614	0,825
Security of female users against harassment at stops		0,79	0,789	0,849

Table 2: Selected factor loadings for variables of interest (empty cell indicates loading lower than 0,4)

Fig. 1 outlines the importance and satisfaction analysis of the results of the first survey, based only on the average score per gender and it shows that the average satisfaction score is in general very low. In fact, in a scale from one to five, the average satisfaction score is less than 2.5 for all users, except in 5 attributes (4: safety against theft on board, 7: Safety against theft at stops, 16: Service provision, 17: Travel speed, 19: Waiting time during transfer), where female users' average satisfaction score is more than 2.5 points. Another pattern that can be inferred from Fig. 1 is that men tend to evaluate the various attributes as more important compared to female counterparts, while they are also less satisfied. It is indeed surprising that this pattern unexpectedly holds in points (4: safety against theft on board, 5: Safety against female harassment on board, 7: Safety against theft at stops, 8: Safety against female harassment at stops). The previous pattern changes slightly in three attributes, in which male respondents seem more satisfied than female respondents: 16: service provision hours, 25: geographic network coverage, and 26: distance from last stop and final destinations. One explanation to the fact that women in general seem more satisfied with PUT services is that they are more reliant on them, as they have fewer alternatives (e.g., driving license: 40% for female vs. 79% for male

respondents, access to car: 43% for female vs. 82% for male respondents in our sample).

In order to explore more specifically the difference in perceptions between male and female respondents with respect to the questions about female harassment, we performed several different sets of factor analyses (Washington et al., 2020), based on the following dimensions:

- Importance; satisfaction.
- Entire sample; female respondents only; male respondents only.

In Table 2 we summarize the obtained factor loadings for each of the main variables of interest. In fact, it is confirmed that the loadings of each of the variables are higher for female respondents, than male respondents.

### Discussion

GBV is a significant issue, affecting many cities around the world. In this research, we use data from an online survey, conducted in Cairo, Egypt, to gain insight into the issue. The findings from this study are being used to develop a larger, face-to-face survey, to be conducted in

the Cairo PUT system. The authors are aware of the limitations of the current preliminary study, including the sample size and potential bias, due to the opportunistic data collection. However, we believe that they provide some initial insights and add to the literature.

The full survey will enable the development of suitable econometric models (such as Integrated Choice and Latent variable models), that will be used to determine more factors affecting women's daily travel decisions, and to understand women's cognitive perception of safety and GBV, and their impact on travel behaviour. Women's perception of the different dimensions of GBV, and personal safety during the different trip phases will be evaluated in parallel with the number, severity, and locations of the incidents they have faced to investigate the impact of different dimensions of the incidents on women's perception, and the resulting change in daily travel decisions. Current survey data from literature suggests that different women harassment experiences also vary according to location, therefore indicators for different types of GBV (e.g., sexual, physical and verbal harassment) are going to be explored to analyse the impact of different GBV experiences on women's travel behaviour.

Understanding the factors affecting women's travel decisions and cognitive travel behaviour, perception of safety, and perception of harassment severity will enable a better grasp not only on the travel behaviour of women, but also the extent of GBV influences. The results will provide planners and decision-makers with useful knowledge to address underlying issues affecting the harassment phenomenon of GBV, not only for transport in cities of the Mediterranean region, but also in many other regions in the world, where similar issues remain.

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## Keywords

Egypt, Public transportation, Travel pattern, Gender-based violence (GBV)