Open theses topics
Gender and Mobility

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Starting date: As soon as possible

Women represent almost 50% of the world's population, and they have a specific travel behavior compared to males. The difference in travel behavior by gender comes from females' daily responsibilities and their challenges while commuting. Women are generally expected to take the more significant share of fulfilling the family obligation, such as domestic work, and elderly and childcare (Blumen, 2000; Ruiz & Nicolás, 2018; Sánchez, Isabel, & González, 2014). The cultural approval, in some places, that women are expected to perform extra responsibilities has forced them to perform more complex, shorter, multi-chain, multi-purpose trips compared to males, especially in multi-person households (Fan, 2017; Patterson, Ewing, & Haider, 2005). Globally, it has been evident that women tend to travel shorter distance trips, perform more non-work-related trips, and these trips are usually outside the peak hours (Ng & Acker, 2018). The association of shorter trips with women was observed in the UK for all travel modes (Root, Schintler, & Button, 2000).

Another important aspect of travel pattern is the mode choice; where women tend to prefer to use public transportation (PT) over the use of cars. This has been observed for example in India (Mahadevia, 2012; Mahadevia & Advani, 2016), Sweden (Polk, 2004), USA (Rosenbloom, 2004), and Germany (Vance & Iovanna, 2007). The difference in mode choice is not only evident in the case of conventional modes used travel (e.g PT, private vehicles, and taxi), but it is also extended to shared mobility; where females are less frequent users in the cases of scooter sharing, bikesharing, carsharing, and ride-sourcing services than male users (Degele et al., 2018; Fishman, Washington, & Haworth, 2014; Goodman, Green, & Woodcock, 2014; Howe & Bock, 2018; Kim, Ko, & Park, 2015; Murphy & Usher, 2015; Ogilvie & Goodman, 2012; Raux, Zoubir, & Geyik, 2017; Shaheen & Martin, 2015; Shaheen, Stocker, & Mundler, 2017). The current use pattern of shared mobility increases the gender gap in our cities (Singh, 2020).

Women face several challenges in their daily commute; gender-based violence (GBV) is one of these challenges. GBV is evident, especially during the use of PT, and it is not limited to developing countries, but it is a worldwide phenomenon. 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 PT systems for women, according to a survey performed by Thomson Reuters Foundation (CNN, 2014). The GBV problem is also extended to shared mobility, and in some incidents, a ride-hailing trip resulted in a woman being raped or murdered (Guo, Tang, Tang, & Wang, 2018; He et al., 2020). Ait Bihi Ouali, Graham, Barron, and Trompet (2019) concluded that there is a significant gender gap in the perception of safety while using PT, in which women are more likely to feel unsafe than men. Also, the design and operation of PT overlooking gender differences provide a system that

tends to hinder women's access to opportunities and contribute to the social impacts caused by gender inequality. A similar low perception of safety by female commuters while using ride-hailing was observed, especially after severe accidents took place in China (He et al., 2020). Several policies and initiatives have been adopted and proposed to increase the feeling of safety while commuting for female travelers, such as women-exclusive wagons. However, the impacts of these policies are not fully comprehended yet, and it is not clear if these policies increase women's perception of safety or they increase the mobility gender gap.

Women were observed to have less affinity to adopt emerging technology-based mobility systems. This has been observed in the cases of urban air mobility (UAM) (Al Haddad, Chaniotakis, Straubinger, Plötner, & Antoniou, 2020), autonomous vehicles (Abraham et al., 2017; Hohenberger, Spörrle, & Welpe, 2016), and autonomous shared mobility(De Luca & Di Pace, 2015), where women expressed less attraction to use these services than males. The understanding of factors influencing women's perception of new technologies and factors that discourage their use by women is vital to improve the planning process for such technologies, to include women under their service umbrella, to reduce the gender gap in mobility, and to remove the movement barriers in the urban environment.

Based on the previous discussion, the following theses are suggested

- Consequences of transport inequality for women.
- Evaluation of women-exclusive transportation services (literature review).
- Why are females late adaptors for new emerging mobility/technologies (e.g autonomous vehicles, UAM, and Hyperloop ?
- Gender gap in shared mobility systems: reasons and factors behind this gap.
- Gender gap/differences in travel behavior.
- Travel experience of female travellers.
- Impact of gender–based violence on travel behavior.
- How adequate policy–making can reduce the gender gap in travel patterns?
- Developed vs. developing countries. What's the difference and what can we learn from different cities?
- Evaluation of policies implemented to increase women's safety during travelling (Literature review).

Also, if you have any topics inspired by the previous discussion, and the previous topics contact us directly by sending an email to: Christelle Al Haddad (christelle.haddad@tum.de), and Mohamed Abouelela (Mohamed.Abouelela@tum.de).

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