Gendered Design for Gendered Crisis: Women's Experiences in Public Transport

Pınar Kaygan, & Harun Kaygan

Abstract *This paper presents findings from a research project that investigates the link between the design of public transport and women passengers' experiences of (risk of) sexual harassment. Sexual harassment in public transport is a particularly important topic to explore as a crisis situation, since women face sexual harassment widely while using public transport both in the contexts of the Global South and North. In the project, in-depth investigation of women's experiences via interviews was followed by an explorative design process, where designers responded to users' problems as well as strategies in their design proposals. The process had a participatory nature with the involvement of an urban planner, a member of a local feminist organisation as well as the reflections of a design manager from a leading bus manufacturing company. Drawing on multiple data sources elicited from designer and non-designer participants, this paper pulls together different parties' perspectives on the role of design in the solution of a gender-related social problem. Overall, the paper invites designers to explore the potential links between structural change and design applications in industry, making product design instrumental to policy planning and implementation for egalitarian and safe public transport.*

Author keywords *design; gender; public transport; vehicle design; design for gender equity*

1. Introduction

Following the increasing popularity of a social turn in design research and education in the last two decades, social design projects have tackled issues on sustainability, citizen empowerment, good governance, among others (Tromp & Vial, 2023). Gender issues, especially as a feminist goal, however, have rarely been located at the centre of these projects. This paper aims to redress this gap by presenting findings from our GENCOM (Gendered Commutes) project, where we investigated the link between the design of public transport vehicles and women passengers' experiences of (risk of) sexual harassment. Women face sexual harassment widely while using public transport over the world, as demonstrated by studies from Latin America, Eu-

rope, Southern Asia, North America and Middle East (Ramboll Smart Mobility, 2021; Drăguțescu et al., 2020; Arjmand, 2017; Gardner et al., 2017; Madan and Nalla, 2016; Kash, 2020; Loukaitou-Sideris, 2016; Tandoğan & Şimşek İlhan, 2016). These studies report several common concerns regarding harassment in overcrowded and empty vehicles, bus stops and stations, and as women walk through pedestrian subways, bridges, desolated buildings, quiet streets and roads, and empty parks, especially at night and after dark. Sexual harassment in public transport is experienced in several ways, from non-contact forms of harassment, both verbal and visual, such as sexual comments, intrusive questions, staring, and exhibitionism, to physical forms of harassment, which include groping, sexual rubbing and other forms of inappropriate touching (Madan & Nalla, 2016; Ceccato & Paz, 2017). Non-contact forms constitute the majority of harassment incidents, yet physical harassment is also experienced frequently inside the vehicles, especially when they are crowded. For many women, harassment while using public transport is a daily occurrence in both the Global South and North, and the concerns caused by the risk of exposure to sexual harassment influence women's mobility-related choices such as route and travel duration, thus limiting women's freedom of movement (Allen, 2018). Many women avoid travelling alone at night, and when they have to, they tend to choose the transport mode that provides the most direct link to home, such as taxi. For self-protection, they adopt several strategies, such as changing clothes; adopting unapproachable expressions; travelling with others; showing verbal and physical resistance; and reporting to authorities and police (Lea, D'Silva & Asok, 2017; Quinones, 2020). The recent report by Ramboll Smart Mobility (2021, p. 33) identifies the strategies that women utilise in Germany when they use public transport at night as "walking with their keys visible in their hand to make potential attackers think that they live in the area, sticking the keys between the fingers so it can act like a weapon or pretending to be talking on the phone while walking alone." Inside the bus, strategies include sitting close to the driver, so that women can avoid getting bothered by male passengers and ask for help from the driver if they feel any risks.

In GENCOM project, we focused on Ankara, the capital city of Turkey, where hundreds of sexual harassment cases in public transport are reported each year (Durmuş, 2013; Hanözü et al., 2015). The project explored how and to what extent the gender-related problems experienced by women passengers could be addressed as design problems. We first conducted interviews with 32 women transit users, where we explored women's interactions with the vehicle interiors as passengers, especially how the vehicle mediated their interactions with others. We asked about their travel routines, and how they described the experience of 'being a woman' on public transport. While we deliberately avoided mentioning harassment or safety, these issues still dominated our participants' accounts. Analysing the interviews, we focused on their preferences and concerns regarding the interactions afforded by the vehicle interiors, and the strategies via which women took advantage of the

social and material affordances in the environment to prepare for, avoid and react to perceived dangers.

The interview findings were discussed in a previous journal article (Kaygan, Kaygan & Özgür Keysan 2023), and are summarised in the next section. In this paper we focus on the second stage of the project, where we ran a series of explorative design activities addressing these findings. We invited four industrial designers with diverse expertise to incorporate users' problems as well as coping strategies into their design practices from a critical gender perspective. The activities had a participatory nature with the involvement of an urban planner, a member of a local feminist organisation, and the reflections of a design manager from a leading bus manufacturing company. Drawing on multiple data sources, including 12 design proposals, a workshop, a focus group meeting, the designers' reflexive diaries, and an interview with a design manager, the paper intends to pull together different parties' perspectives on the role of design in the solution of a gender-related social problem.

Design is a cultural and material practice that shapes the ways we live with social consequences. In this paper we consider gender-based threats to women's safety and wellbeing on public mobility environments as a gendered crisis that restricts their freedom of movement, since mobility is a fundamental human need that constitutes the prerequisite to the enjoyment of human rights, including access to health, education, work, and leisure (Martínez, Maldonado & Schönsteiner, 2023). Although the above-summarised common challenges women face in mobility are well-documented by extensive research in fields of urban planning, mobility, gender studies, gender-responsive solutions to mobility are still in their infancy over the world. As the GENCOM project required us to engage in the topic of public transportation from the perspective of both social research and transport industry, we observed a lack of dialogue between the two: the former often concludes with implications for policymaking, while the latter is concerned with developing more effective solutions to improve products' technical aspects. This paper bridges this gap, suggesting that a nuanced and full understanding of this multi-dimensional mobility crisis, which has so far remained a topic in the agenda of social science researchers and policymakers, requires the involvement of design practitioners and industry, who shape the socio-technical mobility environments where this crisis takes place.

2. Vehicle Design and Sexual Harassment as Gendered Crisis in Public Transport

The first stage of the project showed that public transport vehicles are designed with gender-blind scripts (Akrich, 1992). We identified two main themes: physical contact and lines of sight. Firstly, women experience that the interiors afford unsolicited, sometimes inappropriate physical contact when taken advantage by perpetrators.

The affordances include the placement and proximity of seats, blind spots in the sitting plan, underdefined large spaces for standing, and shared handles. Most sexual assaults occur in the ambiguous environment created by crowded vehicles during peak hours, where lack of space provides opportunities for inappropriate touch, especially rubbing and groping. These assaults rely on the self-doubt of the victims as well as the onlookers: "Did he really touch me/her, or was it by accident?" Secondly, how the interior space distributes visibility inside the vehicle matters, because blind spots created by crowds or by isolated sitting arrangements afford harassment. Similarly, high visibility and the unwanted attention it brings were also matters of concern. For example, seats placed along the vehicle facing the corridor, face-to-face seats, and lack of external scenery in the underground make it difficult for passengers to avoid eye contact (Kaygan, Kaygan & Özgür Keysan 2023).

As women assess the risks afforded by various designed elements on the vehicle, they develop their own strategies to navigate the interior space and establish their personal space. For this, they choose where to sit and stand deliberately. They prefer single seats, window seats, higher seats, seats distanced from individuals or groups of men that they perceive as a threat, especially at night. They prefer standing with their back against the wall or the window and/or watching outside to avoid lines of sight. Women also adopt exit strategies, making use of their personal ICTs, especially mobile phones, to make themselves unavailable in the vehicle, or to share their current location with acquaintances when they feel under risk (Kaygan, Kaygan & Özgür Keysan, 2023).

3. Design Activities

The project originally included a design intervention workshop, where design students would be brought together with stakeholders. Due to Covid-19 pandemic restrictions, the plan was revised to involve four experienced designers, who worked remotely to develop ideas for design interventions. We also included experts from academy, industry, and a women's organisation in the workshop to discuss our interview findings. Design intervention activities were organised as follows:

A. **Problem exploration workshop:** The project team, four designers and experts came together at an online meeting. The team made a presentation on the interview findings. Then, experts were invited to comment on the findings. This was followed by an open discussion with the designers.
B. **Design process:** After the workshop, each designer worked individually to reframe the design problem and develop ideas for three design interventions. They were asked to reflect on their experiences, and document their thoughts, rea-

soning and feelings about dealing with a social rather than a technical problem through design in a diary.

C. **Focus group meeting:** The project team and the designers met online for a focus group interview. While the diaries already provided individual reflections, the focus group triggered a collective discussion on designing for a gendered problem, in other words, on "gendered design" from a professional point of view.
D. **Opportunity exploration meeting with industry:** The project team arranged an online meeting with the design manager of a leading bus manufacturer company to discuss opportunities and approaches for transferring the knowledge produced in the project into practice.

Perspectives on design interventions perceived by the stakeholders

One of the experts that participated in the problem exploration workshop was a social science researcher, who was also a member of a local feminist organisation and had an editorial role in a local newspaper that focuses on Ankara's problems from a critical angle (Participant A). From the outset she presented a strong position regarding design's potential role vis-à-vis the problems we identified. From her perspective, sexual harassment in public transport is not a problem to be solved by designing vehicles differently, since it is an outcome and expression of systemic gender inequalities. Such a structural issue can only be dealt with via persistent law- and policymaking and implementation. However, she added that design could play a mitigating role by reducing risks in the vehicle, and through creating an overall awareness regarding the problem, until the structural inequalities that reinforce gender-based violence are tackled effectively. She expressed worries that if the problem is formulated as "women users' different needs", this could support conservative tendencies for gender-segregation, e.g. in public transport. Another participant, an urban planner and design educator (Participant B) accordingly suggested that if generating a comprehensive solution to the given problem is beyond the capabilities of design practice, then designers should exploit intervention opportunities where they can contribute to a larger solution. This, he argued, called for a critical and reflexive design practice.

The design manager (Participant C) argued that product design and development in the transport industry is led by customer demands, therefore user-centred design is difficult to implement, let alone considerations of social issues. Public transport design relies on solving technical problems formalised as technical specifications provided by customers, as in bidding documents provided by municipalities. Consequently, the unsolicited interactions during transit should first be acknowledged as a vehicle-related problem by the stakeholders who make the purchasing decisions for the vehicles, in this case not the passengers or drivers but the municipalities, in order for the industry to consider it a viable design problem.

His analogy was the European Accessibility Act, which made wheelchair access a requirement as part of technical specifications provided by municipalities, which in turn led to a significant redesign of the buses.

Design proposals developed by the four designers demonstrated that a shift from gender-blind to gender-responsive design could lead to various solutions that might help reduce the ambiguity of underdefined spaces and thus help individual passengers delineate their personal spaces better, or more generally create a basic awareness of personal space inside the vehicles. Figure 1 shows a design proposal in which a curved holding bar can provide each passenger their own handle, eliminating anxieties about unsolicited touch. Figure 2 demonstrates another holding bar design that helps separate standing and sitting passengers.

Another designer proposed dividers that create a series of standing spaces inside the vehicles, responding to our research findings that women prefer to stand with their back against a corner to feel safer (Figure 3).

Figure 1: Holding bar for multiple users by Tuğçe Sönmez Evin

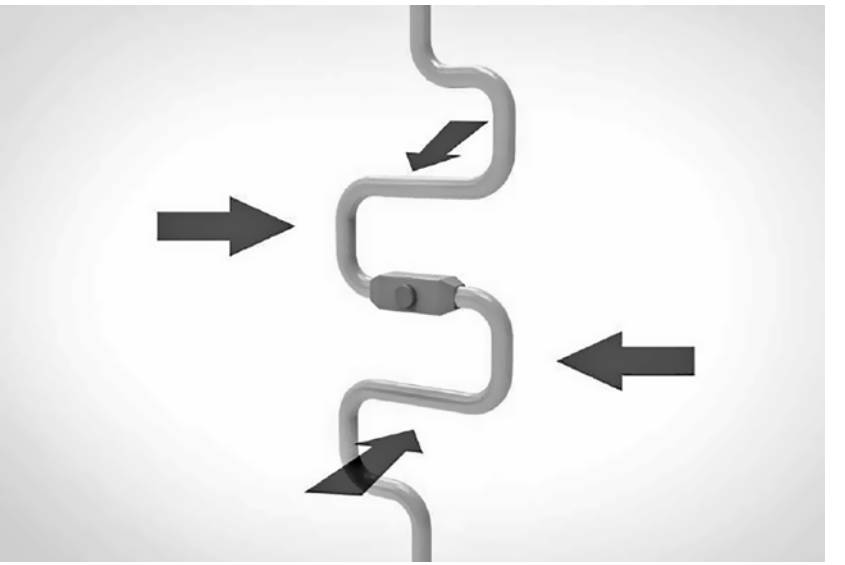
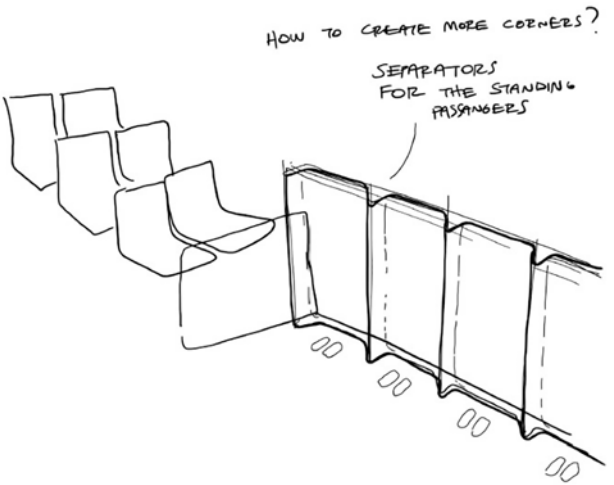


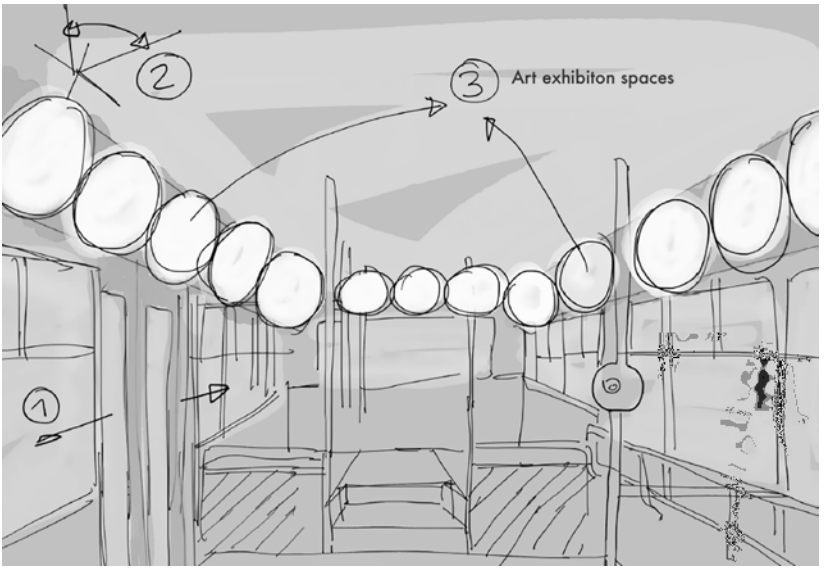
Figure 2: Holding bar next to seats by Tuğçe Sönmez Evin

Figure 3: Corners for standing passengers by Berk İlhan



Designers also addressed issues related to ambiguity as issues caused by the distribution of lines of sight. Some proposals offered designated surfaces for passengers to stare at, i.e. screens or posters, so as to avoid unwanted eye contact and any anxiety this causes during travel. Figure 4 shows a solution where such screens are used to exhibit digital artwork in collaboration with local artists and municipality.

Figure 4: Screens to stare at by Cansu Bezmez



The focus group discussion revealed that, although designers presented several design ideas that responded to our brief, they were not entirely convinced by the effectiveness of incorporating gender considerations into the design of vehicle interiors. This was in line with their diary entries commenting on the difficulty of the task. The focus group collectively made a distinction between (1) immediate design interventions in a crisis situation, i.e. gender-responsive design of vehicle interiors, and (2) collaborative multi-stakeholder design approaches that should be deployed in public sector with an eye to proposing long-term, structural solutions to social problems, as represented by design approaches such as systemic design, community design and policy design. Within this distinction, they created a hierarchy between the two, valuing the latter over the former. As one designer summed up at the end of the focus group, they arrived at a consensus that "[sexual harassment in public transport] is not the bus' fault", so it cannot be overcome by any changes in the vehicle interiors.

4. Concluding Discussion

We agree with our participants, both the designers and the experts, that structural problems need policy-level solutions. Novel approaches such as transition design have been striving to formulate ways for designers to approach structural issues (Irwin, 2018), while in design for sustainability, there is a history of increased emphasis in system-level interventions at the expense of product-level solutions (Ceschin & Gaziulusoy, 2016). However, as Dore (2022) argues and other participatory design researchers have shown (Palmås & Von Busch, 2015; Huybrechts et al., 2017; Kaethler et al., 2017), relying on institutional frames in the face of structural problems, in this case gender equity, can mask the political terrain. In Dore's fieldwork, such frames could be challenged "through multi-level tactics that mobilized actors beyond the state's framework" (2022, p. 41). In our case, these are represented by the community actors as well as the transport industry, all of which are in the fabric of the social relations that make up the institutional relations. Furthermore, an overemphasis on social structure undermines the agency as well as the immediacy of designed everyday products that mediate the social relations between people in a crisis situation. In other words, we find value in the capacity of industrial design of mobility products as a relevant approach for responding to social problems and crises, in so far as it is realised through a multi-stakeholder lens: our interview with the design manager from the industry encouraged us to suggest that designers can and should develop strategic alliances with not only local governments, civil societies, and communities, but also with the industry, where the social and political implications of design are veiled under both the matter-of-factness of technical specifications and seemingly unbreachable economic constraints. Moreover, although new kinds of design activities have gradually been gaining prominence in the public sector, organising and managing design in public sector have their own challenges caused by the highly varying design-maturity levels of different units as well as the lack of a shared understanding of design among various actors including designers, managers and civil servants (Hyysalo et al., 2023).

This paper invites design researchers, practitioners and educators to explore the potential links between design applications in industry and structural change, *making product design instrumental to policy planning and implementation for egalitarian and safe public transport*. As we attested in previous work (Kaygan, Kaygan & Özgür Keysan, 2023; Kaygan, Kaygan & Demir, 2019) like other scholars in the field of feminist technology studies (see for example, Oudshoorn, Saetnan & Lie, 2002; Aaltojärvi, 2012; van Oost, 2003; Rommes, Bos & Geerdink, 2011), products embody and convey gender relations—even when they are designed for the use of 'everyone' as in the case of public transport vehicles. This is because products are gendered by design, often in the ways that conform to and reinforce the normative gender roles in society, through the inscription of uncritical user representations into

the materiality of products. Gender-blind products, taking their places in social life for the use of 'everyone', then, play an important role in the maintenance of gender inequities by affording interactions that put certain gender identities into a disadvantaged position. Thus, we believe that products can also be designed in gender-responsive, even -transformative ways, to address gender issues that occur in the actual use contexts and the interactions between users.

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