Fair Mobility Report 2025

State of the Art

2. APRIL

Fair Mobility is a European funded project, which started in 2024 and will last till 2026. It´s project volume is 1,4 million Euros. Fair Mobility involves four countries: Germany, France, Austria and Rumania. The aim of the project is to improve mobility framework for women and gender minorities, especially in rural areas. Findings of the Eurobarometer survey revealed:

"Women are more likely to travel in connection with care work"
"Women are more likely to use public transport"
"Women are more often harassed in public spaces"

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Fair Mobility - State of the art

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Gender equality is recognized as a fundamental right by the European Commission, which has developed a dual approach to achieving it: systematically integrating a gender perspective into the design, implementation, and evaluation of public policies (gender mainstreaming) and eliminating, preventing, or remedying gender inequalities. Despite these general guidelines, incorporating a gender perspective into mobility policies and promoting mobility gender equity remains a challenge today, as evidenced by the persistent inequalities in mobility access and experiences between men and women. Although the gender dimension and intersectional approaches have been sparsely integrated into mobility research, apart from a few pioneering works, they have received renewed attention over the last ten years, alongside issues of equity and justice (Fuzier, 2022).

This state of the art of the existing international literature aims at two main objectives. The first is to synthesize the state of knowledge in the academic field around issues of mobility, gender inequalities, and justice. The goal is to produce a selective review of existing work in line with our research concerns, both in terms of understanding inequalities and the theoretical approaches and methodological tools necessary for their analysis. This knowledge serves as a basis for our own field surveys and reflections, allowing us to more clearly identify where the collective project can offer complementary proposals. The second objective is to clarify our positioning and intentions. This project indeed mobilizes notions of mobility, gender, accessibility, peri-urban/rural, space, etc., which fit into a specific theoretical framework, that of critical urban studies and feminist approaches. The state of the art allows us to specify this approach and show how it fits into the broader field of mobility studies and gender inequalities.

We have structured the state of the art into five thematic parts. The two first one summarizes what we know about gender inequalities in mobility. First, these inequalities are analyzed in the light of differences of social roles of men and women, and second, through harassment and violence experiences in the public space or during the trips. The third part provides an overview of research focused on the specificity of these inequalities and discriminations in the peri-urban and rural territories. The fourth part concerns the relationships between sustainability and gender equality issues. The fifth and last part is focusing on how to tackle gender mobility inequalities through justice frameworks.

1. Studying gender's gap in mobility: from "transport disadvantage" to the persistence of gender stereotypes

It was not until the last few decades that work on the gender dimension emerged in mobility studies. However, as early as the 1970s, a number of feminist researchers had highlighted the gender-blind approach to transport and mobility issues (Giuliano, 1979; Rosenbloom, 1978). These studies, which start from women's transport disadvantage (Law, 1999), took up two main themes: the constraints or obstacles to mobility caused by the harassment and violence to which they might be subjected, and the differences between men and women in their journeys to work (Best & Lanzendorf, 2005). In the years that followed, the notion of "transport-related disadvantage" was discussed, particularly in the North American and European contexts, where differential access to modes of transport, while still important and unevenly distributed among social groups, was not the only explanation for the differences observed. It was in particular by taking a closer look at mobility linked to domestic work (see the pioneering work of Hanson & Pratt, 1995), highlighting the persistence of gender stereotypes linked to the gendered

division of labor, that research was able to emphasize the need to understand mobility practices and experiences through the social relations of power that affect women and minorized people. In the global North, main difference concerns the propensity of women to combine a higher set of activities during the day, linked to household tasks, resulting in chaining trips while men adopt more likely one-single purpose trip (Rosenbloom, 1989; Grieco & *al.*, 1989).

This first part begins with a description of the gender differences observed in modal split and access to the car in the various European countries. In countries where the gap is tending to narrow, the differences between men's and women's car use and mobility practices remain marked. Recent research highlights the importance of gendered power relationships, interwoven with class and race power relationships, in maintaining these differences, based in particular on an analysis of domestic mobility practices.

1.1. Gender inequalities in the access and use of transport modes

Despite the democratization of the automobile and access to motorized mobility in most of European countries, differences in access to mobility and practices remain significant between men and women.

Uneven gendered gaps in modal split and access to private car in Europe

Gender-differentiated mobility are reflected in the travel modes used. In average, more women travel on foot or by public transport than men, who, for their part, are more likely to travel by private car (Scheiner & Holz-Rau, 2012; Polk, 2004, Miralles-Guasch & *al.*, 2016).

In all countries in European Union, the most used transport mode for local trip is the individual car (Fiorello & *al.*, 2016). The widespread introduction of driving licenses in the second half of the 20th century mainly concerned the male population (Scharff, 1991). Until the 1970s, 30% of French women had a driving license, compared with 70% of men (Roux & *al.*, 2010). In recent years, these discrepancies seem to have diminished, or even disappeared in some countries, particularly for younger generations (European Commission, 2014). Indeed, in some European countries, gender no longer appears to be such a discriminating factor in driving license ownership, as in Austria (Unbehaun & *al.*, 2014). In 2010, in Finland, Ireland, the Netherlands and Sweden, the number of female drivers was equivalent to or even slightly higher than the number of male drivers (European Commission, 2014).

This more egalitarian distribution of access to driving is reflected in an almost similar modal share of the car, suggesting a narrowing of the gender gap. In Sweden, for example, the modal share of car use among women rose from 24% to 37% between 1978 and 2006 (compared with an increase from 55% to 56% for men over the same period) (Frändberg & Vilhelmson, 2011). In France, the share of trips made by car over the years 2018-2019 has a very small gap (less than 2 points) between women and men. However, it also seems important to note that trends in access to cars are not following a uniform trajectory across Europe. In Italy, between 2001 and 2010, the proportion of women drivers fell by 8 points, from 52% to 44% (European Commission, 2014). This decline can also be observed in Cyprus and Belgium. More egalitarian access to driving is therefore not a given, but can be called into question depending on the circumstances and the period. In other European countries, by contrast, the differences in access to cars between women and men remain very significant, as in Tirana, Albania (Pojani & *al.*, 2017), or Poland (Maciejewska & Miralles-Guasch, 2020).

In countries where the gender gap in car modal share is narrowing, automobile use is still gendered. A large proportion of men use the car alone for direct trips, whereas women make more complex trip chains, using a wider variety of travel modes (Shaw & *al.*, 2020), and are more often accompanied than men.

When deprived of the speed and flexibility offered by a car, women face spatial and temporal constraints that significantly intensify the demands on their overall time use (Boarnet & Hsu, 2015). The mobility of women without cars is therefore more restricted, relying on a combination of different modes of transport and optimization of travel strategies. Their use of slower travel modes on average results in a lower daily distance traveled than men's (Root & *al.*, 2000). Women are also more exposed than men, on average, to schedule constraints, possible cancellations, or delays (Lynch & Atkins, 1988). The absence of a car then leads to a reduction in opportunities, particularly with regard to employment, education or training (Crane, 2007; Dobbs, 2005). According to Michael L. Berger (1986), masculine car culture helps to maintain a patriarchal distribution of activities, both spatially and in terms of their nature, and thus consolidates the relationship of domination of men over women.

Yet the car appears to be a mode of travel suited to the complex chains of travel and the numerous stops made by women - especially mothers - in their daily mobility (Rosenbloom, 1989; Miralles-Guasch & *al.*, 2016). This is particularly the case for single mothers, who take advantage of the flexibility of the car to respond to the spatial and temporal complexity of their activity schedules (Cerdà Beneito, 2022), even among women on low incomes (Turner & Grieco, 2000; Blumenberg, 2004; Rosenbloom & Burns, 1994). Insofar as public transport offers are not wheelchair-friendly, the car becomes essential for the mobility of mothers whose children have a disability (Landby, 2019). The spread of driving among women has thus been accompanied by an increase in the number of journeys and distances required for domestic work (taking children to school, leisure activities, shopping, etc.). In this way, the automobile no longer represents a symbol of women's emancipation, but rather the extension of domestic work to a space larger than the home (Demoli, 2014). The figures of the "cab mom" and chauffeuring highlight the constraints placed on driving mothers (Schwanen, 2007).

Furthermore, the gap in driving practices widens with age, not just because of a generational effect, but above all because of the intersecting effects of gender and aging. As people age, the regulatory processes involved in driving take different trajectories according to gender. Women restrict their driving to a greater extent, and give up driving at an earlier age (Lafont & *al.*, 2015; Hanson, 2010). Men, meanwhile, are more likely to prolong driving despite the onset of cognitive impairment (Marie Dit Asse & *al.*, 2014). Older women are more likely to use alternative modes of transport, such as public transport, or to be a passenger in a vehicle. They are also more inclined to reduce their travel, and stay at home for several days, including among more recent generations in France (Pélata, 2024). Rosenbloom (2006) highlights the low mobility of older women and their disadvantage compared to men in terms of accessibility.

In countries where women and men have quasi equivalent levels of driver's license ownership, men are more likely to take the wheel (Peters, 2011). Many stereotypes about male and female driving persist, particularly in adolescent years. In Europe, while statistics point to a male preponderance among the alleged perpetrators of accidents, particularly fatal ones (Peytavin, 2023; European Commission, 2014; ITF, 2018), surveys of social representations of women's and men's driving don't paint the same picture. Men are more easily associated with risky driving, but also great technical ability and self-control when driving. Conversely, women's incompetence, caution and lack of self-control are shared representations. In France, these representations are particularly prevalent among the teenage population (Degraeve & *al.*, 2015). Gendered socialization to a car culture begins in childhood. Boys are more likely to play with cars than girls (Leaper & Friedman, 2007). Masculine car culture and the perpetuation of stereotypes linked to women's driving contribute to men's dominant position on the road (Jouanno & Hummel, 2016). The association of the private car with masculinity is still very much present (Miralles-Guach & *al.*, 2016). Thus, the greater use of the car by men cannot be explained solely by the nature of the activities performed, or by material factors such as access to transport or the spatial distribution of activities. Indeed, the mobility practices and modal choices adopted by women are less harmful to the environment, "*even when external conditions were similar*" (Miralles-Guach & *al.*, 2016).

Intersected factors of inequalities

Income remains a primary limiting factor to car access. On average, single women, and in particular single mothers, have lower incomes than their male counterparts. Moreover, in single-motorised heterosexual households, the car is very often the prerogative of husbands, to the detriment of their wives' mobility (Dobbs, 2005). Use of car often constitute a heavily financial burden for precarious people, especially single mothers with children (Blumenberg, 2004). According to Lynch and Atkins (1988), due to weaker economic power, women have less money to spend on travel and are more dependent on public transport.

According to Turner and Grieco (2000, 130), gender "differences in transport and travel patterns are generated out of the differential access of the genders to economic resources, social resources and time resources". Economically precarious women, in particular, have a reduced range of choices and are therefore more exposed to this dependency on public transport. Rebecca Cardelli (2021) explains that access to public space, in general, is conditioned by the resources available to individuals in terms of economic, geographical, social, and physical capital. Joanne Le Bars (2018) specifically focused on the mobility of undocumented women in Paris through an in-depth qualitative survey. She showed how the least endowed woman in her survey was forced to resort to emergency shelters, often far from the city, thus becoming a victim of forced mobility leading to isolation. Conversely, women with more social and economic resources used their capital to avoid shelters and thus had more fluid mobility. Her study also highlighted the spatial constraints that crystallize around women's bodies, particularly when they are pregnant. This example illustrates the gendered, racialized, and precarious experience of the city. Not all women have the same resources to combat these inequalities. In the U.S., several studies have shown that race influences the choice of mode of travel to work, as does gender (Doyle & Taylor, 2000). Black women in New York are the most frequent users of public transport (Crane, 2007). The Mobility in Germany survey in 2002, the only one to have integrated statistics on nationality, showed that immigrants did not travel less than German nationals but did so differently, using cars less and public transport more (Welsch & *al.*, 2018). It also highlighted how inequalities related to ethnic origin and nationality combine, underscoring an intertwined influence of power relations on mobility practices. Julia A. Ericksen (1977) analyzed women's commutes to work, noting that these commutes are longer for Black women than for white women. She explains that this is more due to differences in residential locations than to the demands of domestic work, as Black women are more often concentrated in central cities, which are congested and where commutes are therefore particularly long.

1.2. Understanding the persistence of gendered social roles through mobility practices

In social spaces, individuals *perform* their gender on a daily basis (Butler, 2006), that is, they conform to gender norms and binary dictates of what it would means and implies to be a woman or a man. "Gender role" refers to the set of attitudes and behaviors that people adopt as a function of their assigned gender. These social expectations are reflected in a number of ways, including different social roles and duties among men and women, according to which it would be the duty and role of women to take care of the house, children, family organization, and all the tasks traditionally linked to the private sphere.

Within public spaces, women have thus internalized all kinds of spatial practices that are different from those of men, often more constrained and complex. In this process, urban spaces can thus be considered as "spaces of gender construction" (Clair, 2012), in that they reaffirm power dynamics and gender inequalities. Indeed, gender norms produce spatial differentiation by defining territories considered

masculine or feminine (link to the expected gender roles). In doing so, they still contribute to the association between the feminine and domestic space (or their proximity), and between the masculine and public spaces (Coutras, 1996). Indeed, the gendered division of labor between men and women result in limiting the accessible territories for women, which are reduced to the field of actions and tasks related to the domestic and family sphere (Cardelli, 2021). Although the distinction between women-private spaces and men-public spaces has become more nuanced in recent years, particularly with the rise in female employment rates, this evolution has been more marked by women's investment in public spaces than by men's investment in private spaces (Dussuet, 2004).

Because of these gendered norms and social roles, still deeply rooted in our customs and society, household and domestic burdens are still mainly undertaken by women. Inés Sánchez de Madariaga defined "care work" as « *the unpaid labor performed by adults for children and other dependents, including labor related to the upkeep of a household* » (Sánchez De Madariaga, 2013, p.33). Indeed, despite a growing tendency of more equal sharing of domestic tasks among men and women, the division of labor still follow a very traditional organization, following a "male-breadwinner-and-female-housewife model" (Scheiner & Holz-Rau, 2017, p. 118). This care-related work assumed by women produce multiple effects on their everyday life, in terms of social implications, mental charge, time management or spatial patterns. Women find themselves having to adopt particular spatial and temporal relationships in their daily lives, which need to be explained.

As a result, women are more constrained and restricted in their relationship with space, often having to reconcile their domestic and professional lives, which tends to create internal conflicts for the majority of them, between their demands expected of their job and those of their home (Ericksen, 1977). This situation ultimately imposes severe spatial and temporal constraints on them (Kwan, 2000). Indeed, they have to deal with more 'space-time fixity constraints' than men (Schwanen, 2008). This means that the social roles they have to fulfill are directly connected to specific places and time-line that are immutable, such as picking up children from schools, which is in a specific unchanging place and at a specific time. Women can be considered as "masters of domestic time" since they have to take care of these constraining schedules and timeline of children's activities, household, family gatherings, and so on (Montulet & Hubert, 2008).

These differences between men's and women's time use, linked to the fact that women still take on a large proportion of domestic and care work, there are differences in the mobility of men and women. In particular, in the Western world, men's journeys tend to be longer and more direct than those of women, who include more links between journeys to carry out different tasks: taking children to school, shopping, medical visits, etc. (Scheiner & Holz-Rau, 2017; Cresswell & Uteng, 2008; Law, 1999; Hanson & Johnston, 1995; Hanson & Pratt, 1995). It has been indeed proved statistically that women spend shorter times on work commute travel, but longer times in household support travel time, and this in almost all household structure[1], meaning whatever the family structure is (with or without children, with or without a partner, etc.) (Fan, 2017). This can be explained by the fact that women will tend to choose or prioritize a job close to home, so that they can meet their social domestic tasks as we explained above. More precisely, « *women with demanding home roles have shorter journeys to work* » (Ericksen, 1977, p. 428).

However, women's mobility is characterized by a multiplication of travels when it come to their care-related work. This "care mobility" can be defined as all « *the daily travel required to complete care labor such as travel to the grocery story, or to escort children* » (Ravensbergen & *al.*, 2022, 1499). When we look at these specific travels, we realize that women travel longer then men for household-serving

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[1] Yingling Fan analyzed empirical travel time among six different household structures, and these results were observable in all the household structures, except in the 'single-breadwinner couple without children' one (Fan, 2017).

purposes: it represents 32% of women's daily mobility, against 25% of men (Ravensbergen & *al.*, 2022). This specific form of over-mobility is a significant part of women's daily commute, and is characterized for instance by round-trips to pick up children from school during the lunch break, and to bring them back in the afternoon (Gibout, 2004). It has been shown that it is particularly the fact of having children that increases women's household-related journeys, and not so the presence of a partner (Fan, 2017). These different social roles result in greater time constraints for women than for men. In mobility practices, these constraints are reflected in particular in the need to coordinate multiple activities in space and time, sometimes for more than one person (e.g. taking children to school or to sporting activities). Marie Gilow has defined "domestic mobility work" to encompass all the movements involved in running a household. Using the case of Brussels as an example, she shows that it consists of "a major logistical work that requires the spatio-temporal coherence of uncoordinated spheres of life and [a] transport work that requires a particular physical condition in the public space, involving at the same time an effort of supervision and care when children are accompanied" (Gilow, 2019, p. 5).

Furthermore, women do not have the same experience of mobility, depending on other social factors which came into play. For instance, Ravensbergen & *al.* (2023) found that the gendered gaps in mobility of care were the largest for household with the lowest incomes. Indeed, regardless of the number of children, for households with the highest incomes, care-related journeys represent a much lower proportion of their daily trips (*ibid.*). This can be explained by the place of residence, which is often more restrictive in terms of accessibility and mobility for people in precarious situations, since they will have less choice of place of residence for economic reasons.

Women's mobility is thus much more complex and diffuse, characterized by « *the fragmentation of activities in space and/or time, the variety of activities performed, or the number and/or distribution of spatially and/or temporally fixed anchor points in daily life* » (Scheiner & Holz-Rau, 2017, p.120). Typical mobility surveys often fail to account for care mobility, precisely because of their construction of chain-trips, which come to be mislabeled, under the motives "shopping", "visits" or "leisure", or not taken into account at all, because typical surveys tend not to take short trips into account (less than 1km or less than 15 minutes) (Coutras, 1997; Sanchez De Madariaga, 2013). Main studies of mobility therefore omit gender inequalities in mobility, by mostly taken "paid work" and home-to-work travels as their reference point. There is therefore an urgent need to recognize and take into account these issues of care-related mobility, particularly so that they can be incorporated into the design of public transport infrastructure (*ibid.*). Even more so when we know that women are the one who use public transport the most on a daily basis (Berger & *al.*, 2019), despite the constraints imposed by the latter (in terms of schedule, delays, frequencies, unsuitability of load carriers, etc.). In France, for example, two-thirds of public transport passengers are women (Jouanno & Hummel, 2016). This constraint of using public transport for care mobility will become even more pronounced for women on the lowest incomes, who will have no choice but to take the cheapest mode of transport. Women with higher incomes will indeed be more able to choose the most suitable mode of transport for their journeys, often considered to be the car (Lynch & Atkins, 1988), which represent a high economic cost.

2. Safety, harassment and violence

Much of the existing literature on the theme of women in the public space tackles the subject through the issues of (un)safety and (un)security of women in the street. Many research focused on a particular form of violence, that is sexual violence, which is higher compare for women compare to men (Smith, 2008; Debonneville & Lieber, 2021). Women are indeed the main victims of 'gender-based violence', which is the act of violence inflicted on individuals because of their gender (definition by the European Institute

for Gender Equality). Gender-based violence, either physical or psychological, is part of a larger system of a continuum of violence[2[2]] (Kelly, 2019). These acts of violence, rooted in dynamics of power, reaffirm the hierarchy between men and women, and function at redefining gender norms (Debonneville & Lieber, 2021). Harassment and violence profoundly impact the experience of mobility of women and minorized groups as well as their ability to use public spaces and their travel practice.

2.1 Gendered public spaces

Gender is to be understood as a way of socially and spatially organizing the place of men and women in society, by assigning individuals either to the dominant group of men or to the dominated group of women (Clair, 2008). Public spaces, like all social spaces, are structured by gender norms which induce differentiated relationships to space and mobility, characterized by what Gill Valentine calls a « *spatial expression of patriarchy* » (Valentine, 1989, p. 389). Public spaces bear the marks of male domination, whether in the names of squares or streets, which overwhelmingly celebrate men, the still significant presence of sexist advertising or sports facilities that are mainly dedicated to traditionally male activities (Jarrigeon, 2019). As a result, according to Chris Blache, men are more legitimate to frequent public spaces, while women are more easily subjected to criticism, particularly when they are immobile[3[3]].

Previous researches on violence in public spaces reported that men are more often victims (and perpetrators) of crime, but these often fail to take into account all the "non-criminal" everyday acts, which constrains women's mobility and their use of the city[4[4]] (Vera-Gray, 2016). In order to report them, the French survey *Virage* "Violences et rapports de genre" (violence and gender relations), conducted by the national institute of demographic studies (Brown & al, 2020), established among five types of violence the category of "unwelcomed flirt". It shows that 15% of women reporter unwelcoming flirt in the last 12 months, against only 2% of men (Lebugle & al., 2020). Women are thus more often the victims of these types of behavior, whether it is stares, whistling, intrusive words and so on, which control their actions and movements in public space.

Women are indeed confronted on a daily basis with an omnipresent male gaze[5[5]], which scrutinizes the normalized women's behaviors in the city, and condemns the others (Di Méo, 2011). It conditions their place in the public space by reminding them that they must negotiate their place and legitimacy in the public space. Women's access to and use of public space is thus structured by these power relations,

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2[2] The "continuum of violence" is a theoretical framework developed by the scholar Liz Kelly in 1987, according to which violence towards women have to be seen as embodied in a social patriarchal system, and sign of this structural effect rather than deviant or isolate incident.

3[3] Dumeurger M., "Chris Blache : face aux villes trop viriles ». *Libération*, avril 2021.

4[4] Alongside with the fact that rates of sexual assault remain largely underestimated by the data, which often come from police departments. Only 5% to 6% of sexual assaults are reported to the police, according to data from the 2018 Safety in Public and Private Spaces Survey (Cotter & Savage, 2019).

5[5] Male gaze is a concept introduced by the feminist theorist Mulvey in 1975. It refers to the fact that women in pop culture are mainly represented through the prism of heterosexual male, who objectifies them. The concept has become increasingly popular, and today mainly refers to this omnipresent and constraining 'male gaze' in women's bodies, often internalized by women themselves, therefore impacting the way they are presented and present themselves in public sphere.

which act as reminders of the heterosexual gendered order, condemning any deviation and emancipation from the norm (Debonneville & Lieber, 2021). These social norms are instilled in women through gendered socialization, through which they internalize social expectations in terms of behavior (including mobility), clothing, attitudes, etc., and thus reaffirm the patriarchal heterosexual social order (Jarrigeon, 2019). Isabelle Clair, explains how important is the "*social image*" for women and especially girls, and how this image is constructed according to whether or not they conform to what is expected of them, to the prevailing norm (Clair, 2008, p. 30). She highlights the role of social control and sanction represented by "*social etiquette*", or "*reputation*", assigned in particular when there is a "*visible transgression of the sexual reserve collectively expected of girls*" (ibid., p. 29). She describes "reputation" as a pejorative labeling of girls according to their supposed degree of virtue, which thus reaffirms the order of gender norms and gives the impression of instituting a binary categorization between "good girls" and "whores" (Clair, 2012, p. 72).

Rivière (2019) studied the transmission of gendered relationships to urban public spaces, particularly from mothers to daughters. He explains how puberty is a key moment of transition, from which girls are more exposed to the unwanted glances and solicitations of men, resulting in greater supervision and control of their movement and self-presentation in space (Rivière, 2019). Women therefore tend not to feel legitimate in public space, and to have to negotiate their place, especially in spaces considered as out of the zone assigned to their gender role. Guy Di Méo (2011) introduced the notion of "invisible walls" to refer to mental barriers that women internalize in their use of the city, which can lead to bypass or avoidance of certain places being outside of the spatial imaginary of women. This gendered socialization leads therefore to different relationships to spaces and mobility practices between men and women.

2.2 Feeling of insecurity and mobility practices

Marie Gilow (2015) points out that Anglo-Saxon feminists were the first to demonstrate that women's personal fears limited their use of public space in the city (Hanmer, 1977; Stanko, 1990). Condon & *al.* (2005) point out that the feeling of fear, often taken for granted by women as an effect of their 'nature', has not been studied as such in France. Fear is rooted in the socio-sexual construction of space and the feeling of illegitimacy that women experience in public space: it is by transgressing spatial or temporal boundaries (travelling at night) that they expose themselves to the risk of violence (Pain, 1997).

Women are therefore forced to conform to what is expected of them in the public space, on pain of being exposed to harassment or violence. It follows that they are much more afraid of crime than men (Hsu, 2011). This feeling of insecurity, and especially fear of sexual assaults, impact their mobility and travel choices (Gardner & *al.*, 2017). Women in their mobility in the city have indeed adopted and internalized constrained spatial practices to deal with this feeling of insecurity, which often involve strategies of avoidance, circumvention or protection (Cardelli, 2021; Ring & Gardner, 1996). This feeling of insecurity is often internalized, and especially associated with certain spaces for which women will reduce their use in order to protect themselves (Hsu, 2011). Thus, « *women's fear of crime becomes an environmental mobility restrictor on their daily activities* » (Hsu, 2011, p. 87). As the survey by Condon & *al.* (2005) shows, the anticipation of violence is a constant for the people interviewed, simply because they identify as women. As a result, "the reasons for women's reported fears are not necessarily linked to personal experience of physical aggression, but to gender violence" (Condon & *al.*, 2005, p. 288). Vigilance takes the form of various avoidance tactics. For instance, women will tend to avoid unfamiliar places, especially under certain circumstances - if they are alone and at certain hours, especially at night - which Marylène Lieber call "risk avoidance" practices (Lieber, 2008). Indeed, it would seem that

women's "urban anxiety" is accentuated according to distinct "anxiety-provoking socio-spatial configurations", i.e a combination of spatial form and human presence, such as a predominantly male presence or deserted areas, and enclosed, dark or narrow areas (Gilow & Lannoy, 2017). Going out at night or taking night-time transport, for example, is a particular temporal condition for women that increases their fear and sometimes leads them to restrict themselves to going out after certain hours. The 2000 national survey on violence against women in France (*enquête nationale sur la violence envers les femmes en France*) has shown that almost 40% of women avoid going out alone at night, and that many of them think and elaborate in detail the route they are going to take (Condon & al., 2005). This feeling and experience of insecurity also impacts the mode of transport women will choose to travel. Many surveys reported that the safest modes of transport for women are cars and taxis, especially at night (Lynch & Atkins, 1988). Conversely, where only 1% of women felt unsafe taking the bus during the day, this result rises to 22% by nightfall (*ibid.*). Depending on these perceptions and the associated modes of transport, women will have to adopter their travel pattern.

Violence shapes a particularly painful experience of movement. Fear of violence and crime encountered on and around public transport, and its associated public spaces, can be an important factor in the travel choices (or lack of choice) of these group (Weintrob & *al.*, 2021). These safety issues are often the ones most often put forward when discussing gender inequalities in transport. Sometimes grasped by mobility stakeholders, they are often misunderstood or misappropriated to point the finger at women's "risky" behavior (Listerborn, 2016) or to present them as victims in transport (e.g. RATP campaign).

2.3 Violence against LGBTQIA+ and minorized groups

However, talking about "women" as a homogenous social category, without further distinctions, omits the other power relations and constraints to which some women may be expose, which, in an intersectional approach, become interwoven with gender inequalities. These other social factors include the age, economic situation, social status, race, religion, sexual orientation and so on. For instance, women with fewer economic resources will less be able to choose their modes of transport, and will therefore have no other choice than to rely on cheapest modes, perceived as less safe (for example walking, especially late), or to not transport at all (Lynch & Atkins, 1988). That is why, « *the travel patterns of women with lower economic resources are likely to be more constrained by security fears* » (ibid., p. 262).

As the use of public space is structured by different power relations, gender-based violence is compounded by other forms of violence such as lesbophobia, transphobia, racism, islamophobia and so on. For instance, LGBTQIA+ women are subject to greater violence, as they are perceived as transgressing gendered norms (Ring & Gardner, 1996), they normally suffer violence as a form of sanction for behaviour that does not follow the heterosexual norm, because they are women and LGBTQIA+ they suffer the phenomenon known as double victimization (Nash, 2021; Cattan & Clerval, 2011). The same phenomena happen with women wearing the veil, which crystallizes the link between gender violence and racism, and expose women to greater violence (Debonneville & Lieber, 2021). People who 'violate' social norms or exhibit relatively higher levels of gender or sexual 'non confirmity may, consequently, experience higher levels of gender- and sexuality-based violence and discrimination (Doan & Higgins 2009)

The LGBTQIA+ community suffer intolerance, harassment, human rights violations and social exclusion in diverse social arenas (Katz-Wise & Hyde, 2012; Lee & Ostergard, 2017). Social identity can significantly influence people's mobilities and accessibility opportunities (Adkins & *al.*, 2017) and their experienced levels of social inclusion (Adkins & al. 2017; Kenyon & Rafferty 2002; Lubitow & *al.*, 2017; Lucas, 2012). They identity, visibility, and awareness of the possibility of being in danger – affect

mobility opportunities, including self-regulation and perceptions of safety while travelling (Corteen, 2002; Mason, 2001). Self-identified queer women appeared to be the most harassed group versus gay men who faced relatively less violence and mobility disadvantage, so even in LGBTQIA+ studies female bodies will suffer more sanctions when they appear in public space. Strategies are also placated in the creation of safe territories, known as gay neighborhoods, which offer this public some sense of security in expressing their identity, but which restrict this group to segmented territories (Giraud, 2014). In order to avoid violence, non-binary people stop expressing their identity in public spaces and use tools such as e-mobility (mobility via the internet) to express themselves. E-mobility has also contributed to LGBTQIA+ people being able to recognize themselves and meet without suffering the violence of public spaces (Nash, 2014). Reported crimes against LGBTQIA+ people are usually (but not always) enacted near venues dedicated to, or frequented by, LGBTQIA+ people (Herek & *al.*, 2002).

Marked by anonymity, by symbols and silent gestures, homosexual territoriality is made possible when only those who are part of the group understand the rules and symbols, the night is therefore one of those possibilities of being able to express oneself only to those who can see, and therefore uncovering this veil makes LGBTQIA+ people less secure (Leroy, 2009).

Naming spaces as homosexual is perceived as a benefit of heterosexual bodies to distinguish and reject them, so maintaining anonymity is in the best interest of LGBTQIA+ people but makes it difficult to understand their practices in the territory (Leroy, 2009). Research into mobility, however, shows that public transportation and even individual transportation (app-based cars) present themselves as a microcosm of the homophobic reality in which these people are crossed by micro-violence and in some cases, such as trans bodies, by physical violence (Lubitow & *al.*, 2017; Weintrob & *al.*, 2021).

2.4 Gendered experience of public transport

Public transport is a place where gender-based violence occurs particularly frequently (ITF, 2018; Duchène, 2011; Ortega & *al.*, 2019). In France, the high council for equality between women and men (2015) then reveals that 100% of female public transport users have been victims of sexist harassment or sexual assault.

Exposure to harassment and aggression increases for LGBTQIA+ people. Looking at the experience of travelling on public transport for transgender or gender non-conforming people, Lubitow & *al.* (2017) highlight the strong presence of cissexist behavior. This violence reinforces feelings of insecurity and anxiety during travel. They are mainly perpetrated by other users, within stations during waiting periods. Within the LGBTQIA+ acronym gender and sexuality oppressions exist in different ways but are always marked by violence as a common variable of minoritized bodies. Proved by studies on lesbian women experiencing harassment (Marguerit & Cardoso, 2022), the creation of gay territorization and "gaytrification" (Giraud, 2014), transmobility violence in public transportation (Lubitow & *al.*, 2017), and new studies on how non-binary people can be better identified in surveys such as mobility surveys (Dou, 2021), etc. Within vehicles, Marguerit (2022) points to the peak hours and saturation of metro trains in Paris as a situation where violence is particularly prevalent. Transport service employees and the processes involved in dealing with victims can also constitute an additional form of oppression and violence (Lubitow et *al.*, 2020). Being identified as someone who differs from the dominant cisgender norm mingles with other systems of oppression (Lubitow & *al.*, 2017). People adopt their threshold of tolerance or normalization of violence (Lubitow & *al.*, 2017; Marguerit & Cardoso, 2022). Hypervigilance strategies are then employed. These are combined with mobility restrictions (taking public transport at certain times, avoiding empty carriages) (Root & al., 2000).

3. Gender's gaps in mobility in rural and peri-urban areas

In rural and peri-urban areas, the low density of amenities tends to increase the need to travel, while the lack of public transport increases car use. Gender differences in mobility have as yet been little studied in these remote areas. Recent research shows that the "transport disadvantage" specific to these areas, combined with the persistence of the gendered division of labour, increases the constraints on women in terms of access and mobility practices.

Although the rate of motorization among women is rising, it still lags behind that of men, significantly constraining their daily travel options (Granié & Varet, 2017). The expenses associated with obtaining a driver's license, along with the ongoing costs of car maintenance, exert a substantial influence on the trade-offs within households and effective access to car of women. Lionel Rougé (2018) in his work on peri-urban spaces highlights this major gender difference in the maintenance of autonomous mobility - automobile, where the majority of the household lady's mobility appears secondary. In addition, bi-activity within couples more often implies the acceptance of the "first job that comes" for women to the detriment of their qualifications due to a lack of car mobility. This strong gendered division of labour is combined with more restricted female mobility in peri-urban areas (Rougé, 2018). The lower motorization therefore leads to a greater use of alternative modes to the car, such as public transport or active modes, de *facto* limiting the space travelled.

3.1 Complex mobility patterns for women and adaptation strategies

The distance from urban centrality remains a determining factor in the construction of mobility practices and it tends to increase disparities between women and men, at a time when women retain a major part of domestic work. The daily burden of women is based on the use of a diversity of locations (shops, public and administrative services, schools, leisure facilities). The time spent on these activities increases with distance from the multiple places of domestic work (shopping, school, friends, family), and is rarely restricted to the local space (Berg & Ihlström, 2019). This "hyper-mobility" induced by unpaid domestic work can also be understood as "over-mobility" in the sense of an unwanted over-consumption of space and time that results from repeated, multiplied and anticipated movements (Gibout, 2004). The type of space therefore strongly influences the organization of daily life, time-schedule and the choice of transport mode. For women living in suburban areas, the car is often the only solution for meeting all the time constraints associated with domestic work and looking after children; however, particularly for women on limited incomes, car travel can be very restrictive and costly (Demoli & Gilow, 2019). Sometimes these constraints can lead to the renunciation of participation in certain activities, especially leisure activities, due to the temporal restriction that this imposes (Berg & Ihlström, 2019). Thus, the limited supply of local services reinforces the weight of domestic work in the daily schedule, especially for women (Agnoux, 2023).

These space-times of domestic work in peri-urban or rural areas reinforce the feeling of constraint experienced by women. According to a survey carried out in several French suburban districts, men tend not to express the difficulties associated with daily mobility, or even to value the moment of travel as a pleasant time, a time of separation between professional and personal life. On the other hand, women experience mobility in a more negative way because of the constraint it represents (Cailly & Dodier, 2007). In addition, women are more likely to use a smaller space, going to peripheral centralities rather

than the city centre of the nearest urban center because of the functional orientation of their journeys: shopping, children (*ibid.*). The stronger anchoring of women to their space of residence due to more restricted mobility could be similar to that of "local dependence", less due to the absence of a car than to the weakening propensity to move outside the familiar space (Dupuy & Fol, 2002).

Women are more likely to choose to live close to their families than men (Orange and Renard, 2022). The constitution of a localized social capital, called "autochthony capital" (Renahy, 2010; Amsellem-Mainguy, 2023), can potentially be invested in the context of informal exchanges of services: childcare, pooling of groceries, family visits, etc. (Fol, 2010; Jouffe, 2014). The creation of a network of local solidarity, reinforced by the socialisation associated with the care of children, contributes to anchor residents who had previously settled in the peripheries (Berger & *al*., 2019). Thus, local social networks represent a resource, especially for non-motorized women. However, it should be noted that childless women, most often from higher socio-professional categories, are the most successful in developing reticular territorialities, with frequent or even daily trips to metropolitan centrality (ibid.). These studies show that peri-urban and rural ways of living are not constructed solely in relation to urban centrality. They cannot be viewed solely in terms of dependency, as is shown by the diversity of women's daily lives in these areas.

3.2 Heavy constraints on mobility may reduce universe of choice

However, the cumulative effect of gender, class and living space remains a strong discriminating factor in terms of autonomy, access to employment and time for oneself. Indeed, rural areas as well as peri-urban areas offer more limited professional opportunities, particularly regarding to gender (Berger et *al*., 2019; Agnoux, 2023). The low diversity of local job offers combined with the search for work close to the activities of unpaid domestic work may lead to the precariousness of women. Women in rural areas are over-represented in the medico-social sector. According to the study conducted by Agnoux (2023) in a predominantly rural French department, the *care* sector represents 26% of jobs. This is also the case in other territorial contexts, whether rural, semi-rural or peri-urban. This can be explained by the over-representation of the medical-social sector in local vocational training courses, to which a majority of girls are directed (Amsellem-Mainguy, 2023). As underlined by S. Orange and F. Renard in their book intitled *Des femmes qui tiennent la campagne (women who hold the countryside)* (2022), female employment in rural and peri-urban areas contributes to the maintenance of essential services. Whether in the support and care of people, from early childhood to old age, or within the local public administration, these positions mostly held by women compensate for the territorial withdrawal of the welfare state (Orange and Renard, 2022). This involvement in the local job market results in "dealing with a restricted space of possibilities", with very often statuses that do not allow material autonomy (Agnoux, 2023). In addition, the "hyper-mobile" vocation of care professions, coupled with atypical schedules and choppy working days, complicates the articulation of the dual schedule between productive and reproductive work (Durand, 2023).

This results in the organizational hardship of feminized jobs in rural areas, on the one hand because of the extension of the domestic sphere but also because of the "injunction to availability" that these professions imply, while their male counterparts, often farmers, work with fixed hours (Agnoux, 2023). This injunction to availability is also increased among young women who a priori have only limited domestic work where "the fact of not having children designates [them] as last-minute replacements" (Agnoux, 2023). Conversely, having children can also influence job insecurity, in particular through the "choice" of part-time work. According to a report by the French Senate (2023), "rural women are more affected by precarious employment conditions: nearly 39% of them are employed part-time, compared to

29% for all French women." (p.6). Very often within a dual-income household, if there is a trade-off to be made, it is often to the detriment of the employment and therefore the mobility of the housekeeper (Rougé, 2018). For example, the reduction in the costs of daily car journeys due to higher fuel prices results in the abandonment of the household women's job in order to save on these costs and to be able to look after the children (Motte-Baumvol & *al.*, 2012). In addition, the supply of childcare services remains more limited in rural than urban areas, which leads us to believe that the fact that staying at home is less a choice than an obligation to ensure the daily life of young children (Belton Chevallier, 2015).

Access to public services in rural or peri-urban areas remains limited to local services, offering more versatility (schools, police stations, sports facilities) while central public services remain more distant and often degraded, to which are added a growing dematerialization of procedures, thus raising questions that go beyond simple physical access to these places (Agnoux & Nicot, 2023). Women are more often responsible for carrying out administrative procedures for the household, so they may face cumulative constraints - hours of public services, financial and time cost of travel, necessary childcare - which are particularly an obstacle to their access (*ibid.*). The distance to services is also a factor in the precariousness of women in rural areas, and to a lesser extent in peri-urban areas, particularly in terms of health. These issues of accessibility to health services in rural and peri-urban areas have been widely documented by research in Europe (in France: Chevillard & Mousquès, 2018; in the USA: Matsuo, 2014; in Poland: Lechowski & Jasion, 2021; in the Czech Republic: Vaishar & Šťastná, 2021). In France, the closure or consolidation of maternity wards in rural areas was a media issue at the turn of the 2010s (Blondel, 2017). The effects of the closure of these services have been little evaluated in terms of mobility and accessibility for people, this choice is more in line with a national ambition to reform the public hospital service by reducing operating costs (*ibid.*). As a result, the place of residence can become a discriminating factor in access to healthcare, and particularly to specialized services in obstetric and gynecological medicine. Also, according to a report by the French Senate, "it takes an average of 30 minutes to go to a maternity hospital in a rural area, compared to an average of 17 minutes at the national level." (p. 6). This reflects a low level of knowledge of women's specific health needs, which leads to unequal coverage nationwide (Agnoux & Nicot, 2023).

3.3 Increased vulnerability to gender-based violence in rural and peri-urban areas

In addition to the difficulties of access to health care encountered by women living in peri-urban or rural areas, there is a more complex recognition of the sexual and gender-based violence they may suffer. Several dimensions have been identified by the Observatory of Sexist and Sexual Violence of Nouvelle-Aquitaine (France), including geographical isolation and the resulting mobility difficulties, the low presence of specialized associative interfaces, as well as less accessible and fewer reception and accommodation places (Dagorn, 2022). This leads to making invisible the "distress of women living in these rural areas" which are marked by difficulties in mobility and access to services (*Le Monde*, 09/03/2024). A report by the Jean Jaurès Foundation also highlights that access to the gendarmerie but the distance from the courts and the social constraints that legal recourse can pose, as well as the low representativeness in local political bodies, also contribute to this invisibilization (Agnoux and Nicot, 2023). A survey shows that this problem is not directly identified by the respondents, who live in peri-urban areas and poor districts of the city of medium-sized French cities (Alessandrin & Dagorn, 2021). The researchers note "a shift from the issue of sexism to other issues deemed more important such as social inequalities, discrimination or mobility difficulties."(Alessandrin & Dagorn, 2021, p. 74).

Several studies pointed out that LGBTQ people and communities lived in different places, including "unlikely" and seemingly "unfriendly" places such as rural towns in politically conservative contexts (Butterfield, 2018). Halberstam & Halberstam (2005, p. 36-37) call "metronormativity" the assumption that queer people have to move to a place of "tolerance" and leave their current place to come out and thrive. Despite many critics of this biais, very little attention has been paid to LGBTQIA+ people living in small cities (Gates, 2013; Stone, 2018). Furthermore, with a few exceptions, the scant research conducted with LGBTQIA+ people in small cities has not attended to the local, national, and global dynamics affecting LGBTQIA+ *communities* in these "ordinary" places (Myrdahl, 2013; Robinson, 2006). Focusing on how LGBTQIA+ live in small cities, different authors call attention to the blind spot in sexuality and space theorising that emerges from implicit urban/urban–rural hierarchies (Forstie, 2020, Myrdahl, 2013). Anyhow, even in larger cities, perceived as cosmopolitan, living in a "gay city" does not guarantee LGBTQIA+ safety (Gross, 2015; Hartal, 2018). Even these spaces can generate segregation and invisibility, for example some people avoid frequenting the same spaces as the LGBTQIA+ community so as not to be seen as part of that gay community (Chetchuti-Osorovitz & Jean-Jacques, 2018). Hence anonymity, of larger cities, is important for the LGBTQIA+ community to feel safe, more present than in small towns, but it also generates invisibility about their territorialities (Chetcuti-Osorovitz & Jean-Jacques, 2018).

The mobility of LGBTQIA+ people is impacted by various forms of violence, especially against queer women. Every action that challenges gender norms, such as driving a truck, an activity symbolizing independence and defying male expectations.

In large Western cities, there is relative freedom for gays and lesbians, particularly in neighborhoods that maximize opportunities for meeting others. However, this does not mean everyone seeks visibility; many use strategies of concealment and disidentification for protection (Valentine, 2007). Gay men and women adjust their behavior according to social and spatial contexts to control information about their identity. This need for regulation is more pressing outside LGBTQIA+ "ghettos," where surveillance and the need for adaptation are greater (de Certeau, 1990).

Large cities offer a reduction of this distance, making them attractive to homosexuals who use their bodies as tools of resistance and share experiences of stigmatization, developing a common culture and collective identity. Additionally, studies show that although individual identities are multiple and fluid, power operates in urban spaces to generate hegemonic cultures that can exclude specific social groups. Nevertheless, there are also possibilities for emancipation and appropriation of public space by marginalized groups, such as women and LGBTQIA+ people, through street parades and gay bars, allowing the expression of sexual identities outside the heterosexual framework (Lubitow & *al.*, 2017; Weintrob & *al.*, 2021).

4. Gender and sustainable mobility

Because women make greater use of more frugal modes of transport, emitting fewer greenhouse gases and pollutants, there are of interest to research into sustainable mobility (Hanson, 2010; Shaw et al., 2020; Kawgan-Kagan, 2020; Peters, 2011; Root et al., 2000). According to Miralles-Guash and her colleagues (2016) in Spain, "*in both urban and rural areas, women made greater use of more sustainable* [walking and public] *transport than men*" (p. 9). However, in the same way that poor people's sobriety stems from their lack of resources, women's sobriety is partly due to the persistence of gender norms. For women, the trend towards less polluting modes of transport is also explained by a lack of access to faster, more expensive modes, such as the private car, for economic reasons and social norms. The absence of a critical distance from the weight of power relations therefore may result in an essentialization of

'feminine' practices: "*there are some causes for hope for women being able to lead moves towards more sustainable transport*" (Root & al., 2000, p.381).

Furthermore, when walking or cycling in the public space, or travelling by public transport, bodies are particularly visible. Those who deviate from the dominant cisgender, white, male and able-bodied norm are exposed to more violence. The experience of movement must therefore be understood in terms of power relations between people, according to gender, age, class or ethnicity. It is therefore important to look at mobility as a lived experience, which differs not only between social groups but also between residential contexts.

4.1 Gendered public transport

Women are the main users of public transport services. And yet, in all European countries, women are under-represented in the transport sector (Sansonetti, Davern, 2021, Ng, Acker, 2020). The plurality of each person's experiences, needs and desires is only weakly taken into account in the design of transport offers (Levy, 2013). The hierarchical social relations that operate in public space are not considered in a male-dominated field of transport (Hamilton, Hoyle and Jenkins, 1999). Infrastructures and services are not gender-neutral: they are designed by and for men (Levy, 2023; Noor, Iamtrakul, 2023; Peters, 2011; Hamilton, Jenkins, 2000). There is thus an imbalance between the way public transport is designed and its main users, who are most often women. Infrastructure, locations covered, frequency of service and vehicle type are all choices guided by a rather masculine vision. They are therefore poorly adapted to meet the needs of people who do not correspond to this dominant white, male and able-bodied norm. In many European cities, for example, public transport services are inadequate for people with physical disabilities, or those in wheelchairs (Bartzokas-Tsiompras, 2021).

Dimensioning transport services, as well as main transport infrastructures, is traditionally based on an analysis of commuting flows. The planning of major transport infrastructures (roads and mass transit) is based on models that give priority to the flow of commuter traffic. Besides, timetables are based on workers' point times. Outside metropolitan areas and main centralities, the quality of public transport is generally non adapted to non-work motives, making access more difficult access to shops, leisure and public services. Yet the women are more inclined to make unrelated journeys at off-peak times (Ng and Acker, 2018). In addition, the nature and location of jobs differ according to gender (Blumenberg, 2004). Informal or home-based work areas, predominantly occupied by women, are poorly served by public transport services. Montoya-Robledo and colleagues (2020a) highlight the poor connection between domestic workers' places of work and their homes. Dependence on inadequate public transport supply leads to extremely long journey times between home and work. The experience of travel becomes particularly distressing when the urban network is unable to serve the desired destinations, leading to particularly complex journeys.

4.2 The promises of active mobility

Today, active mobility is highly valued, particularly in response to environmental issues and the quest for sustainable mobility. Walking and cycling are also seen as means of physical activity beneficial to health (Grudgings et al., 2018). Their practice thus corresponds to a tool in the fight against a sedentary lifestyle. It is then encouraged by public authorities based on public health arguments (WHO, 2022). In several EU countries, public policies have been adopted at national or local level to promote active modes of transport. However, their use differs greatly from one country to another, and is highly dependent on the built environment and social context. Walking is more widespread in countries with the highest and lowest income levels (Prince et al., 2022). Walking, like cycling, is a distinct experience with particularly

gendered levels of satisfaction (Carboni et al., 2022; Pirra et al., 2023). Yet this gender dimension does not seem to be sufficiently understood in the choice to engage in an active mode (Prince et al., 2022). The vast majority of walking trips are made by women (Goel et al., 2023; Pirra et al., 2023). Walking is still not widely recognized as a travel mode in its own right. The high modal share of walking for certain population groups often reflects difficulties in accessing other, more expensive modes.

While women's modal share of walking is higher, the space used on foot seems less extensive than that of men (Jensen et al., 2017). In the post-socialist city of Banská Bystrica, Slovakia, Rišová (2021) points to a more compact walking activity space among adolescent girls than boys of the same age, particularly at night. Urban planning seems to influence walking practices in different ways for men and women, with the latter preferring more walkable and open spaces (Rišová, 2021). Walking in public space also makes bodies visible. On the one hand, the experience of walking for bodies that deviate from the dominant cis-male norm seems more controlled and sometimes restricted. Pedestrians who are women and gender minorities find themselves more exposed to the risks of sexist and sexual violence at work in public space (page x). While strategies implemented to circumvent violences testify to the ability of women and gender minorities to be mobile, they also result in a restriction of freedom of movement as well as they underline the control over women's and minorized people bodies in the public space. On the other hand, walking makes it possible to appropriate streets and squares, and legitimize the presence of women and gender minorities in public space (Lieber et al., 2003). Like feminist or pride demonstrations, walking can be a means of asserting one's rights and place in public space (Leroy, 2010).

Regarding cycling, there's a big gap between the practices of men and women. In the majority of territorial contexts, cycling as a means of transport is dominated by young men (Shaw & *al.*, 2020). As a mechanized mode of transport, cycling has long been associated with masculine norms, since it involves the deployment of the body and the use of strength which are characteristics traditionally associated with male bodies. In addition, ancient beliefs associated cycling with female infertility or masturbation (Sayagh, 2017), thus limiting female use. The spread of cycling among women came after that of men. In cities or countries with the highest cycling rates, gender differences are less prevalent in the use of bicycles for travel (Goel & *al.*, 2022). For example, in Ghent, Belgium (Witlox, 2004), the Netherlands (Goel & *al.*, 2022), Germany (Goel & *al.*, 2023) and Finland (Goel and al., 2022), women account for a small majority of bicycle trips. Age is a particularly influential variable when it comes to cycling. Research suggests that the beginning of adolescence is the turning point. Women are particularly under-represented among cyclists after the age of 16 (*ibid*). Older age also seems to be a factor in cycling, with few older women cyclists (Aldred, 2016).

The gendered distinction between cycling practices is expressed through the symbolic dimension and representations associated with this mode. As a technical object, it embodies a masculine symbol (Abord de Chatillon et al., 2021). Its appropriation and practice are thus based on gendered as well as cultural representations. Steinbach & *al.* (2011) highlight the different representations of cycling in different social groups. For the white middle class, cycling embodies an ecological and health-care lifestyle. Some women from different ethnic backgrounds consider this mode of travel inappropriate for them, associating it with middle-class white men (Steinbach & *al.*, 2011). For other men, the bicycle represents a symbol of poverty and cannot be considered. Cyclists perform gender norms through the aesthetic dimension of their outfits or equipment (Pelgrims, 2023), which can vary from city to city, country to country. Cycling can be associated with a quest for performance when conceived as an active mode of travel among men (Steinbach, 2011). In a conception shared by more women, cycling would correspond more to a means of doing sport, of maintaining one's athletic condition (Sayagh, 2018). Cycling culture thus influences cycling practices, which may explain the differences between different countries and gender differences.

In its standard form, the bicycle seems unsuitable for mobility that includes accompanying children and carrying heavy loads, particularly outside urban centers (Bonham & Wilson, 2012; Emond et al., 2009). People in charge of care mobility then seem less inclined to choose cycling as a mode of travel for domestic work (Dickinson & *al.*, 2003; Delmelle & Delmelle, 2012). For parents, especially mothers, riding with children does not always seem to be appropriate (Clayton & Musselwhite, 2013), not least

because of a feeling of insecurity, even on cycle lanes (Sersli & *al.*, 2020). Men in Logroño, Spain, make greater use of shared bikes on weekdays, which is not the case at weekends, where practices are similar between the sexes (Cortez-Ordoñez & Tulcanaza-Prieto, 2023). This suggests that it is the different activities invested in, stemming from a gendered division of labor, more marked during the week that shape cycling mobility (Prati, 2018, Ravensbergen & *al.*, 2019), particularly for mothers (Eyer, Ferreira, 2015).

Yet, faster than walking and more flexible than public transport, this mode seems suited to complex travel chains and numerous stopping points during a journey (Eyer, Ferreira, 2015, Ravensbergen & *al.*, 2020). Equipped with baskets, child seats or carts, bicycles can be used to support bicycle care mobility (Ravesenbergen & *al.*, 2020), as can cargo bikes (Riggs, Schwartz, 2018). Cycling is a vector of emancipation for women (Paquot, 2009 cited by Mundler & Rérat, 2018). In this sense, learning-to-bike courses represent a source of empowerment, as is the case for women from immigrant backgrounds in various Swiss cities (Mundler, Rérat, 2018). Cycling mothers in Botogà, for example, overcome the stereotypes of greater vulnerability assigned to them by accompanying their children on bicycles (Montoya-Robledo & *al.*, 2020). In a way, the practice of cycling makes it possible to question gender norms (Abord de Chatillon et al., 2021). According to Pinkster and Boterman (2017), the use of cargo bikes to accompany children questions the dominant norms associated with parenthood. It should be noted, however, that the cost of acquiring this type of bike and equipment is significant, and can be borne by more affluent households. (Sersli & *al.*, 2020).

Encouraging cycling mobility and responding to the needs and preferences of female cyclists would then help to combat inequalities in access to mobility. However, Aldred and colleagues (2016) reveal that the increase in the share of cycling in the modal split of home-to-work trips within several cities in England and Wales does not correspond to a reduction in gender inequalities in cycling. Thus, if the needs and preferences of women and gender minorities are not taken into account before implementing cycling facilities, the gaps in practice remain significant. When public authorities promote this mode of transport, it becomes necessary to integrate the gender dimension into mobility projects (Dickinson & *al.*, 2003; Prati, 2018). Travel distance (Carroll & *al.*, 2020), topography and urban environment are essential factors in the choice of cycling as a mode of transport. Safety, in terms of both personal equipment and cycling infrastructure, is an important issue for women. Women are less likely to cycle on lanes shared with road traffic (Heesch & al., 2012; Prati & *al.*, 2019; Serslsi & *al.*, 2020). Children's cycling practices also seem to be an important element to take into account to encourage this mode of travel and reduce gender inequalities (Ravensbergen & *al.*, 2020), particularly in terms of infrastructure. Moreover, facilities adapted for bicycles are more appreciated by women, but also by men (Emond et al., 2009; Tilahun & *al.*, 2007; Buehler & Dill, 2016)

Research on pedestrian mobility highlights urban density, walkability, bikability and mixed land-use as vectors for more similar mobility between women and men. These criteria would then enable a more equitable distribution of domestic work within heterosexual couples (Boarnet & Hsu, 2015; Fagans Trudeau, 2014; Lo & Houston, 2018). However, the observations made in these central areas may be biased by the fact that couples living in these areas may be those who a more gender-equitable lifestyle. Furthermore, these observations do not integrate important criteria such as income, that may greatly influence the impacts of sexual division of labour, as better-off households outsource part of their domestic work to home workers. Reflections on walking as a means of reducing gender inequalities in mobility have mainly been conducted in dense urban environments. Neighborhoods with good pedestrian and bicycle access, and a better distribution of domestic work mobility, are often those with the highest real estate prices.

5. Gender and mobility justice

Mobility cannot be reduced to issues of access to modes of transport or the experiences and constraints of travel. More broadly, it relates to the ability to move - what Kaufmann (2002) calls 'motility' - and therefore to the possibility or impossibility of travel. Moreover, mobility is not a universal ability: it is socially constructed, framed, controlled and produced as a function of asymmetrical power relationships (Cresswell, 2006). As a result, the problems of inequality and justice in mobility cannot be reduced to simple transport issues, but relate more generally to the way in which mobility capacities and the right to mobility are distributed within social groups and territories. Gender-based mobility inequalities and the resulting issues of justice are one dimension mobility inequalities resulting from the interweaving of multiple social relationships.

5.1 From mobility inequalities to gender-based mobility inequalities

In our contemporary societies, mobility is generally seen as a necessary condition for professional and social integration, particularly through the <u>access</u> it provides to employment and other urban resources. Conversely, immobility, or the inability to move easily, whether physical or due to poverty, is presented as a disability that public policies must seek to remedy. While some scholars consider that mobility contributes to "network capital" (Urry, 2007), other insist that mobility is not always a resource (Salazar, 2016). It can be forced (in the case displacement of populations as a result of conflicts or the impacts of climate change) or it can result from injunctions to be mobile (for instance in the professional realm).

The "social norm of mobility", that is the level of travel considered normal, has increased in recent decades (Massot & Orfeuil, 2005). Since the late 1960s in Europe, and since the 1950s in the United States, the rise of the private car has accompanied the extensive growth of urban areas (suburbanization) and increase in traffic. As well as improving travel conditions, other structural, economic and political dynamics are at work in the social and spatial changes of urban areas. For instance, housing policies that encourage individual property accompanied urban sprawl: middle- and low-income households, families who cannot afford housing in central areas chose to live in the outskirts or rural areas. Other socioeconomic trends such as rising property prices in central areas, gentrification, as well as loss of public services and shops in small towns and rural areas contribute to the increase in travel needs. Individuals, whether their mobility is limited or extensive, have become dependent, in their ways of life, on their access to mobility. Mobility dependency results in two types of damages: a loss of access to local amenities for non-mobile people and higher constraints (in terms of travel time, distances, cost, physical efforts) for highly mobile people (Gallez, 2015; Gallez & Motte-Baumvol, 2018).

Mobility practices are characterized by significant inequalities, in terms of income, gender and race. Travelled distances and the use of fast modes of transport (car, train, plane) are strongly structured according to income, the wealthiest systematically travel more than the working class, whether for daily or long-distance travel. Gender both constitutes mobility and is constituted by mobility in different ways, whether considering the movement itself, but also motility, experiences and meanings (Cresswell & Uteng, 2008). As women take on the majority of domestic tasks (caring for children, the elderly or the sick, administrative formalities, food shopping and home maintenance, etc.), their mobility patterns are generally more complex than those of men (Gilow, 2019). On average, they travel shorter distances every day than men, but they make a series of trips to different locations, sometimes on their way to or from work. In rural or low dense areas, the longer distances involved make day-to-day

organisation particularly difficult, and sometimes mean that women have to give up work or work part-time in order to reconcile their work and family commitments. Similarly, women are in the majority in home services and care, poorly paid jobs that often force them to live far from the centres, while their employers rarely take account of their mobility conditions. Most of the time "inclusive mobility" policies aims at improve access to mobility, but they do not take account of the constraints of highly mobile people. And finally, the problems of harassment and violence in public spaces and on public transport limit access to mobility for women and people from minorities. Mobility is a multi-faceted phenomenon and bears significant impact on the overarching aim of women empowerment (Uteng, 2011).

The claims for justice relating to transport and mobility issues is growing, placing public and political debates on the problems of inequality and respect for the right to mobility from a moral perspective, that is as a justice problem (Gallez, 2022).

5.2 Different approaches of justice

Justice in the broad sense refers to the recognition and respect of the rights and merits of each individual, or the moral principle of conformity to the law. Social justice refers to the way in which the principles of justice are applied in a given society. There are different theories of justice depending on the object(s) to which it is applied and the criteria to which it refers. The utilitarian approach, founded by Jeremy Bentham, aims to maximise overall well-being, without paying attention to how this utility is distributed between individuals. On the opposite, the theory of social justice by John Rawls (1971) is based on *distributive justice*, advocating *equal access* to a series of primary goods (basic freedoms, opportunities for access to social positions and the social benefits associated with these positions) and an organisation of social and economic inequalities that must work in favour of the most disadvantaged. Amartya Sen (1987) criticized Rawls's egalitarian approach, pointing to differences in individual needs, particularly according to physical condition and gender. He insists on an approach to justice that focuses not on formal rights, but on the conditions for their implementation (real rights). He defines individual *capability* as the set of "functionings" (eating enough to eat, accessing education, moving around freely, etc.) that make it possible to lead a good life; it is the lack of capability that should guide public policy.

In these theories, the criteria of justice vary from strict *equality* to different principles of *equity*. *Equality* is one of the central principles of democracy and is based on the belief that all people should have the same opportunities to be successful and have a productive, enjoyable life. *Equity* refers to fairness and equality in outcomes, not just in supports and opportunity.

Although it is at the heart of social justice, *distributive justice* is considered insufficient by various authors, including Sen, who draws on the examples of disability and gender inequality to underline the necessity to take account of the different needs of different people. Feminist authors have taken up issues of justice from the perspective of *recognition* and *procedural justice* (Fraser, 1993; Young, 1990). In 1989, Crenshaw defined intersectionality as "a metaphor for understanding the ways that multiple forms of inequality or disadvantage sometimes compound themselves and create obstacles that often are not understood among conventional ways of thinking". Intersectional approaches are used to understand the social relations of power at the root of inequalities and how to combat them.

5.3 From transport equity to mobility justice

The claims for justice relating to transport and mobility issues is growing, placing public and political debates on the problems of inequality and respect for the right to mobility from a moral perspective

(Gallez, 2022). As a result, interest in these issues has grown in the academic world, giving rise to a wide range of work. Several theories of justice serve as recurring references in the field of transport/mobility (Pereira & *al.*, 2017). In recent years, several authors insisted on the necessity to enlarge issues of transport tackled at the scale of individuals and urban areas to the broader context of mobility justice, questioning how mobility is built, controlled and regulated at the national and international scales. Verlinghieri & Schwanen (2020) propose to distinguish different kinds of works.

- Transport Equity

The shared objective of these works is to integrate equity issues in the methods of transport policy and infrastructure assessment. They criticize the utilitarian approach underlying the methods of socio-economic assessment of transport infrastructure, which aim to maximise the overall well-being of the population without worrying about the distribution of benefits (see for instance van Wee & Geurs, 2011; Martens & *al.*, 2012). The authors recommend the introduction of ethical principles that would allow inequalities to be reintroduced into evaluation methods and the objectives of transport policy and project (for example using maximax ou maximin principles which are two ways of allocating benefits to the least well-on). Other authors favour approaches that involve broader ethical reflections on the dispositions to think, experience and act. The works of Amartya Sen (2008) and Martha Nussbaum (2011) on the notion of capability has been the inspiration for a number of studies. According to Pereira & *al.* (2017), this notion allows us to move away from a global approach to mobility or accessibility as means used to reach places, to take account of people's differentiated needs and their actual ability to use these means.

- Transport Justice

These works are focusing on transport justice, starting from the need to broaden the issues beyond distributive justice (how a 'resource is distributed') in order to take account of wider issues of power (Verlinghieri and Schwanen, 2020). Karner & *al.,* (2020) call for a shift from state-centric to society-centric research on transport and mobility equity and justice, moving from a reflection on how state institutions are integrating equity issues in the assessment of transport policies and projects on an analysis of mobility justice inspired by environmental justice literature and related social movements. In particular, they draw on feminist theories (Young, 1990; Fraser, 1996) to take into account issues of recognition and respect (for rights, needs and values) and procedural justice (participation of all those concerned in the decisions that affect them). This research is also inspired by critical approaches: critical race theory, the right to the city (Lefebvre, 1967), spatial justice (Soja, 2010).

- Mobility Justice

The third type deals with mobility justice by looking at the political regimes and power relations that shape (im)mobilities. For Sheller (2018), mobility justice needs to be discussed through a multi-scale and intersectional approach which recognizes the interactions (in space and through time) between the factors and dynamics of planetary urbanization, migrations and climate change. Davidson (2021) highlights the need to move away from a vision which considers mobility as a resource, advocating the need to take account the socio-technical energy systems associated with the production of mobility (which is based on the extraction and combustion of fossil fuels) and not separating mobility justice and sustainability. In this perspective, the growing importance of digital technology, its environmental impact and its risks (recognition of bodies in terms of skin colour, gender or physical appearance) should be taken into account. More generally a mobile ontology becomes "a core precondition for the development of a predisposition towards justice that overcomes the limits of distributive approaches, which for many critical theorists are ultimately grounded in a masculinist, Euro-American/white, ableist, heterosexual understanding of being and the wider world" (Verlinghieri & Schwanen, 2020).

To be sustainable, mobility must also incorporate a dimension of social justice and equity (Hanson, 2010; Raibaud, 2015). It seems crucial to understand whether differences in mobility practices express different mode choices or illustrate inequalities in access to mobility. More limited or impeded mobility for women may indeed represent poor accessibility and inequalities in the face of opportunities.

6. Conclusion

In a desire for greater social justice, mobility services can be redesigned to ensure accessibility to services, facilities, employment, or care for everyone, regardless of their gender, sexual orientation, or urban residential areas.

These findings raise various issues for public policies aimed at achieving greater gender equality. Consider the example of public transport policies. First is the question of how to adapt transport services, in terms of the locations and populations served, network reliability and connectivity, and safety on board vehicles and in the vicinity of stations, in order to reduce inequalities in accessibility. Second concerns the destinations served, and the times at which they pass, adapted to the activity schedules of people in charge of domestic mobility, loads (baby carriages, shopping bags), and more informal places of work or leisure ((Das, 2020; Joshi & *al.*, 2022). The complexity and rigidity of these schedules requires a high degree of reliability in terms of service and timetables. Lastly, those involved in public transport must be able to seize the challenges of insecurity to better combat all forms of discrimination and violence (Noor, Iamtrakul, 2023; Gardner & *al.*, 2017).

All of these studies, conducted in various territorial contexts, reveal similarities in gender inequalities regarding mobility. However, it seems pertinent to adapt these public policies to local specificities. The local community level seems to be best suited to meet the needs of residents. The state of the art suggests that in rural and peri-urban areas, mobility and accessibility issues arise differently than in large urban areas. Thus, the guides and best practices implemented in large metropolitan areas are not always adaptable to the specificities of peripheral territories. Moreover, outside large metropolitan areas, local authorities often have fewer financial and human resources dedicated to promoting gender equality and combating discrimination, particularly in mobility services. Initiatives implemented, such as raising awareness among young residents about issues of violence in transport or gender access inequalities, and the systematic consideration of gender dimension in public policies, often rely on the work few people with a limited budget.

The production of knowledge specific to peri-urban and rural areas could provide new support for the implementation of public policies for more equitable mobility. The implementation of Action research in a peripheral community can be adapted to highlight the specific issues of this type of territory. This research method, focused on public action, allows for both the acquisition of scientific knowledge on mobility related to gender inequalities and the proposal of concrete actions on the ground. Finally, it would allow for the intersection of different perspectives, both academic and those of local actors related to mobility and gender issues, as well as those of the residents.

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