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Walking in European cities: a gender perception perspective

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Abstract

The COVID-19 pandemic has brought many changes in daily mobility, such as a general increase in the use of active means. However, the shift towards a different mode of transport is always influenced by various aspects that can affect users in distinct ways. Gender is among those factors, and research on this aspect has started to spread in the last decade. In this context, this work investigates how gender could impact the perception of pedestrians in Europe. A survey was designed and spread in Winter 2020-Summer 2021, collecting more than 4000 responses in 10 European regions/countries analysed - France, Italy, Spain, Greece, Portugal, Baltic States, German, Scandinavia, Romania and the United Kingdom. General statistics on the mode chosen for the most frequent journey on a weekday show different trends, with a more significant number of female walkers than males. Gender equity while escorting dependents is found in more than half of the samples, especially in northern European countries. Further analyses are based on the respondents' replies to satisfaction statements regarding walking conditions. Comparing the results from the 10 samples, the satisfaction levels of pedestrians for most samples are lower for women, except for the Romanian sample, where men are less satisfied. Results indicate a difference in the perception of security between men and women in most samples. From the pedestrians' group, women feel more insecure and less satisfied with the provided infrastructure while walking on the streets than men; thus, the proposal of adequate ameliorations is essential to push people to choose this sustainable and equitable active mode for their daily mobility.

Keywords: mobility survey; satisfaction; active modes; gender mobility; pedestrians

1. Introduction

Walking is seen as a healthy, sustainable, accessible, and equitable means of transport that could contribute to reducing social inequalities (Zhao and Wan, 2020). COVID-19 originated with an increase in the use of active means,

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including walking, usually as an alternative to public transport that is perceived as less safe (Campisi et al., 2022, Carboni et al., 2021; Pollard and Wagnild, 2017). Therefore, the attention of city planners is expected to start focusing more and more on pedestrians' needs, to follow the positive shift towards active means due, inevitably, to the changes in mobility originating as an effect of the pandemic. Valuable suggestions come from the European Commission that, for example, devoted to "Active Mobility", a specific section of their proposed guidelines edited to support cities in the implementation of transport planning solutions in their "new life" after COVID-19 (European Platform on Sustainable Urban Mobility Plans, 2020). However, when proposing mobility solutions, it is crucial to address the needs of all potential users. Therefore, policymakers could gain useful insights and plan better mobility solutions by understanding current travellers' perceptions, satisfaction, and mode choice. A challenging and innovative way of doing it is through the proposal of a gendered perspective. Indeed, it is recognised that men and women have different mobility patterns, mainly due to their different daily schedules, which influence their mode choice (Pirra et al., 2021).

Although the investigation of the difference between male and female walkers is still a niche topic in transport research, some relevant elements of the walking experience are strongly influenced by gender. Safety and security are essential aspects: women often modify their behaviour to feel safe, for example, avoiding walking at night if they are alone, talking on the phone to feel safer, and even changing their clothing to prevent unpleasant and frightening situations (International Transport Forum, 2018; Ramboll, 2021; Stark and Meschik, 2018). According to (Hidayati et al., 2020), the gender differences in walking's perceived safety are correlated with spatial configuration and socio-cultural constructs. The potential conflicts with vehicles seem to affect more women as users of active travel transport than men (Carboni et al., 2021). Therefore, safety while crossing streets could be increased thanks to the presence of underpasses or overpasses that helps in reducing the potential of conflicts with other vehicles.

Walking is commonly considered an obliged option when using public transport, as access/egress or during transfer (Goel et al., 2022, Sagaris and Tiznado-Aitken, 2020). Therefore, the perception of women, known to be more frequent transit users than men, is worth to be investigated (Singh, 2020). The existence of pathways in cities, safe pedestrian crossings, and protected bus stops are relevant elements for safety and comfort while travelling around. (Lodovici et al., 2012; Pirra et al., 2021, Sagaris and Tiznado-Aitken, 2020).

According to various studies, walking is a mode commonly chosen by people needing to run household errands: women are the great majority of these people due to the typically higher number of trips done to serve family duties (Pollard and Wagnild, 2017; Ramboll, 2021). Therefore, the maintenance of pathways is fundamental: an even surface while carrying bags and goods could prevent injuries. Falls can also occur among the elderly, as they are physically affected by less stability: good quality and pavement maintenance are again relevant to the walkers' satisfaction (Bernhoft and Carstensen, 2008).

The care of dependents, mainly children, is another family burden commonly entitled to women (Singh, 2020). An adequate pedestrian infrastructure becomes crucial when travelling with people who are not walking at a "usual" speed or that could need the support of devices, such as wheelchairs, strollers, or prams. In this case, other elements should be considered to propose a mobility offer that could fulfil all users' needs. For instance, pedestrian crossings equipped with information and light signals could help aged women or those travelling with dependents be better ready when finalising their path (Bernhoft and Carstensen, 2008). In addition, the previously cited underpasses or overpasses could be positive elements in the infrastructure design as they could support this type of user.

The current paper inserts in TInnGO H2020 project framework (more details about the project here: (Pirra et al., 2021)) that based its action thanks to 10 national hubs covering 10 European areas: Sweden/Denmark, the UK, Spain, Portugal, Italy, Greece, France, Germany, Romania, Lithuania, and the Baltic states. We expand on the started by Carboni et al. (2021, 2022), proposing now a more detailed analysis of all the TInnGO hubs on the walking experience. The following section will present the data collection procedure in these locations and some general statistics. Then, section 3 will analyse some specific questions addressed in the questionnaire to propose a few valuable suggestions for mobility planners who want to provide a walking infrastructure more sensitive to users' (and gender) needs (Section 4).

2. Data collection

2.1. Survey implementation

A specific task in the context of the TInnGO project has been devoted to investigating the users' habits, perceptions, and satisfaction with the mobility offered in the 10 European regions, namely the locations of TInnGO hubs. Preliminary activities involved the discussion through focus groups and a detailed literature review (Pirra et al., 2021). The final product was a survey designed to collect insights on needs, barriers, and improvements that could support the implementation of mobility services closer to a broader pool of users, mainly women. The questionnaire structure includes four sections: information about the respondent's profile, mobility habits, passenger experience, and future intentions.

TInnGO hubs collected data from December 2020 to August 2021, with time frames varying in the various hubs, mainly due to different technical issues in the spread of the survey. COVID-19 caused a delay in the original time scheduled for this project activity (Spring 2020), requiring the hubs to wait for a "new normal" condition throughout Europe. The target was to collect a minimum of 400 responses per hub, being these data statistically representative of the population above 18 in those metropolitan areas/regions/countries. Thus, some hubs offered prizes for participation or subcontracted specialised companies having contacts with appropriate panels of respondents to increase the number of respondents.

This work focuses on a selection of questions proposed in the questionnaire. Some general statistics come from the first and second sections to depict the mobility habits associated with the walking choice. These numbers will be presented and discussed in subsection 2.2. The following analysis will focus on the evaluation provided by pedestrians on their experience around their city (Section 3). In this case, data are extracted from the third section of the questionnaire. Several statements were written in the survey, and respondents were asked to evaluate their satisfaction on a 5-point Likert scale.

2.2. Investigated sample statistics

COVID-19 produced various issues to usual mobility habits worldwide: this reflects various data collection procedures that wanted to investigate travellers' experiences, like those planned in the TInnGO project. Different levels of restrictions in European cities originated in the risk of not collecting adequate information if people were contacted in a moment of reduced mobility due to the pandemic. This situation is reflected in a data collection period that spanned various months and interested the TInnGO hubs in different time ranges.

Table 1. Data collection: hubs, women percentage, the residence of the majority of respondents, corresponding number of answers

Hub	Women (%)	Residence of the majority of respondents	Answers from the total sample
French	53.00	Paris MA	279/400
Italian	49.29	Turin MA	421/421
Spanish	49.55	Valencia MA	389/442
Greek	55.14	Thessaloniki MA	231/399
Portuguese	50.46	Lisbon MA	373/400
Baltic	49.32	Vilnius district	91/440
German	50.00	Western Thuringia Region	80/414
Scandinavian	45.63	Malmö MA	210/412
Romanian	55.60	Alba Iulia MA	254/527
United Kingdom	34.02	Birmingham MA	242/579

As regards the sample, the expected target was the acquisition of at least 400 answers in each hub, coming from a

representative sample of the population above 18. Table 1 presents the number of replies collected with the corresponding percentage of women. The data collection procedure was managed differently in the various countries, both in the area covered and the approach used to spread the surveys. However, as one of the aims of this activity was to focus on cities and their surroundings, it is possible to extract information about the respondents to understand how many of them declared to live in Metropolitan Areas (MAs). Therefore, the corresponding feedback is proposed in the last two columns of Table 1, where it is possible to find the resulting locations and the number of answers derived.

Table 2 proposes information about the primary modes of transport used in the most frequent journey using the full 10 hubs' datasets. The respondents had to answer the following question "Think about the trips you make in a typical week for you (e.g. commuting to work, related to your training or education, escorting and caregiving, going on errands). Which travel modes do you use?" It should be noted that it was possible to choose all the modes used in their most frequent trip in all countries' surveys. The exception was the Italian hub; due to a 'hub's design option, respondents could only choose the mode of transport used in the longer leg of their trip.

The table presents firstly the results from the 5 datasets focusing on the corresponding Metropolitan Areas cited in Table 1. In these 5 samples, some common trends are observed: the car is the most popular transport choice regarding respondents' most frequent journeys in 3 samples. The exceptions are in the French, and Spanish datasets, where public transport and walking are the most popular, respectively. In the 5 samples, the difference between genders relies on being a car driver or passenger. Men use more private vehicles as drivers and women as passengers, with the most significant differences observed in Italian, Spanish and Portuguese hub samples. Another trend observed is that women use more public transport than men, except in the Spanish dataset. It is worth highlighting the low levels of use of public transport (PT) by men in the Greek and Italian samples and the high levels of car usage in the Italian and Greek datasets for both genders. In the case of the French, Portuguese and Spanish hubs, people have reported higher levels of public transport use in their most regular trips. In these 5 samples, the women are confirmed as more frequent walkers and users of public transport (Lodovici et al., 2012; Pirra et al., 2021), except for Greece and Italy, where nearly half use the car on their most frequent journey.

Table 2. Transport mode(s) used in the most frequent trip on a weekday by gender per hub.

Mode choice		FR (MA)	IT (MA)	ES (MA)	GR (MA)	PT (MA)	BA	DE	SC	RO	UK
Walk	M	31%	19%	32%	24%	19%	28%	24%	23%	18%	31%
	W	29%	32%	40%	27%	22%	33%	25%	23%	19%	33%
Owned bicycle	M	5%	5%	2%	9%	1%	10%	15%	18%	6%	8%
	W	5%	2%	4%	2%	2%	5%	18%	16%	2%	5%
Private car (driver)	M	23%	61%	40%	49%	45%	37%	35%	32%	53%	31%
	W	19%	43%	26%	45%	26%	25%	26%	22%	30%	29%
Private car (passenger)	M	5%	2%	2%	10%	7%	11%	8%	6%	8%	10%
	W	7%	2%	7%	14%	10%	17%	6%	11%	21%	15%
Public transport	M	36%	13%	24%	8%	28%	14%	18%	21%	15%	20%
	W	40%	21%	23%	12%	40%	20%	25%	28%	28%	18%

Note: FR – French, IT – Italian, ES – Spanish, GR – Greek, BA – Baltic, DE – German, PT – Portuguese, SC – Scandinavian, RO – Romania, UK – United Kingdom

It is also possible to conclude that in the subsequent 5 datasets, the last 5 columns of Table 2, the car is the primary mode of transport used by the respondents for a typical weekday, with higher percentages of men as drivers in all 5 hubs and women as passengers in 4 samples (except for the UK dataset). As observed in the MA cases, women use more public transport than men in 4 hubs, except for the UK one. Regarding bicycle use in the most frequent journey, the Greek sample also shows higher bike use levels than the other metropolitan areas, but still low compared with the Scandinavian and German results. In these latter samples, the use of the bicycle is close to the level of PT and walking. In the Scandinavian dataset, the results are not surprising as Scandinavian cities, such as these, generally outperform other cities on most indicators regarding the sustainability of transport systems, such as using the soft modes (bicycle

and walk) as usual modes of transport. In this context, the Portuguese dataset presents the lowest percentages of bike usage in the most frequent journey, which may be a consequence of problems in the infrastructure and accessibility for cycling, i.e. coverage of dedicated cycling lanes and bike-sharing docking stations (Padeiro, M., 2022);

Similar percentages of people choosing to make their typical journey by foot, irrespective of gender, are found in almost all the hubs. However, exceptions are present in the Baltic one (28% of men walkers versus 33% of women), Spanish (32% versus 40%) and Italian (19% versus 32%). In these cases, it could be relevant to address further analyses on the female sample to identify needs and specific perceptions.

3. Results and discussion

The previous section helped contextualise how genders chose to travel in their most frequent journey, including walking, the mode this paper aims to focus. We are now introducing data analysis derived from other questionnaire sections that can provide insights into how the users connect with it.

3.1. Travelling with dependents and transport choice

Respondents were asked about their most frequent trips (see Section 2.2). On this occasion, the survey proposed the following question: "Do you usually travel with a dependent person on this trip? (children, elderly, caring for disabled people)". The first two rows of Table 3 collect the percentage of women and men who answered "Yes" in each hub. In the datasets analysed, the gap decreases regarding travellers' behaviour when escorting dependents. The exceptions are in the Greek and French samples, which present the most significant differences between genders, showing that women travel more with dependents than men on their most frequent journeys.

Table 3. Travelling with dependents in the most frequent trip and gender in percentage per hub.

Mode used		FR (MA)	IT (MA)	ES (MA)	GR (MA)	PT (MA)	BA	DE	SC	RO	UK
Travel with dep.	M	6%	9%	2%	6%	7%	16%	7%	4%	6%	14%
	W	10%	6%	5%	11%	6%	15%	8%	5%	5%	10%
Walk	M	33%	12%	40%	53%	12%	36%	27%	22%	58%	48%
	W	32%	17%	65%	30%	21%	35%	34%	27%	41%	41%
Owned bicycle	M	16%	2%	10%	5%	4%	20%	27%	25%	8%	13%
	W	16%	16%	0%	17%	7%	12%	32%	17%	5%	7%
Private car	M	27%	63%	40%	53%	69%	36%	29%	41%	25%	32%
	W	34%	71%	31%	65%	52%	35%	21%	41%	50%	38%
Public transport	M	24%	22%	10%	7%	15%	12%	18%	13%	8%	8%
	W	18%	0%	4%	0%	21%	18%	13%	15%	5%	13%

Note: FR – French, IT – Italian, ES – Spanish, GR – Greek, BA – Baltic, DE – German, PT – Portuguese, SC – Scandinavian, RO – Romania, UK – United Kingdom

The numbers reveal hubs where escorting other people seems to be a shared task between genders in some MA in Portugal, the Baltic States, Germany, Scandinavia and Romania and more a duty of men in the Italian and the UK samples. Nevertheless, in France, Spain and Greece, the traditional gender role prevails as women are primarily escorting dependents. By observing these results, one can presume that maybe, a transition in gender equity in escorting dependents is occurring in some European MAs, especially in northern European countries. Nevertheless, these results do not mean that women have fewer responsibilities undertaken in their daily lives due to the traditional role assigned by society (Pirra et al., 2021; Scheiner and Holz-Rau, 2017).

But what are the factors behind the sharing of escorting by gender? Is it associated with the level of education (predominance of bachelor's or master's degree) and working status (paid employee working in an office/plant) bias of the samples? These results are aligned with (Han et al., 2019), where gender equity in escorting children, in this

case, was associated with highly educated parents with full-time jobs; otherwise, the women take the ones escorting.

Another possibility could be related to the different perceptions associated with the question asked in the survey that we recall here: "Think about the trips you make in a typical week for you (e.g. commuting to work, related to your training or education, escorting and caregiving, going on errands). Which travel modes do you use?" As told previously, respondents have to think if they travel with other people on this usual journey. However, the perception of the "usual journey" can divert among gender due to the different travel patterns characterising them, linear for men and more complex trip chaining for women (CIVITAS, 2014; Pirra et al., 2021). Thus, it could be easier for a man to focus on a single trip and task than a woman who usually travels shorter distances and covers different household personal or social needs before or after work, assuming a women's traditional role in society.

Alternatively, this travel behaviour is related to men having more access to a private car than women, as stated in (Tiikkaja and Liimatainen, 2021), since it is the main mode chosen in all samples to escort dependents. Biking and PT are less preferred modes when travelling with dependents, which may be evidence of low accessibility to public transport for the vulnerable population (disabled, elderly, or children). The comparison among modes shows hubs with good percentages of walkers, such as the Spanish, the Greek, the German, the Baltic, the Romanian, and the UK. Moreover, differences are found comparing gender mainly in Spain, where women prefer walking to using the car, in Romania, where men like to walk, and in the UK, where both genders prefer to walk to escort dependents.

When checking the percentages of these active means, it is possible to see that the highest differences are found in Spain (+25% of women) and Greece (+23% of men). In MAs, escorting on foot is more a female question (3/5 hubs), while the other 5 hubs that include areas outside MAs show the opposite, with a prevalence of males travelling with dependents in 3 of the 5 hubs considered. Also, in this case, it could be interesting to investigate the female sample to identify needs and specific perceptions regarding the walking infrastructure.

3.2. Satisfaction with walking mode indicators

As introduced in Section 2.1, the third part of the questionnaire is devoted to investigating the passenger experience. Indeed, the respondents are asked to provide their evaluation of various statements on different elements of the mobility provision in cities, such as shared modes and public transport, or on personal means, both motorised and not. The question proposed is "How much do you agree with the following statements?" and the respondents could access the level of agreement on the statement on a 5-point Likert scale, where 1 means "totally disagree" and 5 "totally agree".

We focus here on the items devoted to exploring the users' perceptions of their walking experiences:

- W1. I am satisfied with the access to public transport stops (stations, bus stops, …)
- W2. I am satisfied with the coverage of pedestrian routes
- W3. I am satisfied with the security offered by pedestrian walkways (for example, it offers a clear passage)
- W4. I am satisfied with the easiness and security of connections between different modes of transport
- W5. I am satisfied with the level of safety walking on the streets
- W6. I am satisfied with the information for pedestrians on signposts and maps (for example: remaining waiting time on crosswalks)
- W7. I am satisfied with the location of subways and overhead walkways
- W8. I am satisfied with the maintenance and quality of the pavement.

Results are proposed in Table 4 in the format of the mean difference in satisfaction levels between men and women related to the various walking items. A negative value is associated with a better perception of female walkers than their counterparts. When comparing the results among the hubs, the satisfaction levels of pedestrians are usually lower for women, except for the Romanian sample. Here, men are less satisfied than women on 5 over 8 items of this mode, as shown in the corresponding column of Table 4. The main differences in perception are associated with the access to PT, the coverage of the network and the level of security. No significant differences between genders were found in the Italian, Spanish, Baltic, Portuguese, Scandinavian, and UK samples.

Nevertheless, in the Baltic and Greek datasets, there are differences between men and women associated with the location of subways and walkways, as presented in Table 4. In the Scandinavian, Greek and German hub samples, women are less satisfied with the information for pedestrians on signposts and maps (for example: remaining waiting time on crosswalks). At the same time, in the Italian dataset, the ones unsatisfied with the lack of information are the

men. For the French, Spanish, Greek and German datasets, women as pedestrians feel more insecure and less satisfied with the provided infrastructure while walking on the streets. In contrast, in the Romanian sample, the men are more unsatisfied with this aspect than women.

The observation of the rows in Table 4 helps deduce the most relevant issues when comparing the two genders. The indicator "W5. I am satisfied with the level of safety walking on the streets" shows the major differences between men and women in all hubs. Overall, these results confirm that women as pedestrians feel more insecure while walking in their cities (Lodovici et al., 2012; Pirra et al., 2021; Ramboll, 2021; Stark and Meschik, 2018). At the same time, it is possible to observe that the easiness and security of the connection are the only elements in the walking mobility provision that does not seem to be affected by the gender in the investigated dataset.

Table 4. Mean difference in levels of satisfaction between men and women related to walking.

Indicator	FR	IT	ES	GR	PT	BA	DE	SC	RO	UK
W1				0.325					-0.440	
W2				0.555					-0.376	
W3	0.244			0.479					-0.309	
W4				0.365						
W5	0.340		0.231	0.682			0.294		-0.377	
W6		-0.328		0.347			0.408	0.281		
W7				0.563		0.326				
W8	0.384			0.326					-0.319	

Note: FR – French, IT – Italian, ES – Spanish, GR – Greek, BA – Baltic, DE – German, PT – Portuguese, SC – Scandinavian, RO – Romania, UK – United Kingdom

4. Conclusion

Walking is commonly seen as an accessible and equitable mode of transport, mainly after the COVID-19 pandemic. The present study shows the results of a data collection procedure conducted at the European level that depicted the differences in the perception and use of the walking infrastructure according to gender. Further investigations into the data are needed. However, these preliminary analyses demonstrated that the two genders chose different means for their daily mobility in different ways across Europe. Overall, women are recognised as PT users and pedestrians (Lodovici et al., 2012; Pirra et al., 2021; Singh, 2020). Moreover, similar gender percentages of walkers are found mainly in the Metropolitan Areas' datasets. Our analysis also focused on people declaring to travel with dependents during the trips they make in a typical week. Many hubs are characterised by a higher percentage of men escorting people, but we think this could be due to a different interpretation of the "trips you make in a typical week" asked in the question. Indeed, female respondents could have been troubled by thinking about a single trip as they are known to have commonly shorter trips with various destinations in addition to their workplace as they are frequently expected to cover family duties (Pirra et al., 2021; Ramboll, 2021; Singh, 2020).

Observing the differences between genders in the mean satisfaction levels of specific pedestrian infrastructure indicators helps depict the factors relevant for a more inclusive active mobility. Although relevant variances are seen across European cities, a common element is the level of security walking on the streets. This situation is recognised as a fundamental aspect when dealing with female walkers (Hidayati et al., 2020; International Transport Forum, 2018; Ramboll, 2021), and our results are aligned. Further investigations could be addressed to the walking infrastructure in each specific hub, as, for instance, Romanian men are those more unsatisfied with various indicators proposed.

The attention toward more gender-attentive transport planning is gaining more attention worldwide. As walking is commonly seen as an inclusive transport mode, it is fundamental to introduce gender mainstreaming as a strategic approach for assessing the implications of any policy addressing this kind of mode. Various actions could be devoted to this, starting by including a wide spectrum of stakeholders that could assure that different needs are represented when developing strategies. Data collection to identify the users' requirements, also according to their socioeconomics

characteristics, is fundamental. Policymakers in the various cities investigated in our research can exploit the results of this preliminary work to address their citizens' needs better to guarantee a more inclusive, sustainable mobility. As seen, female and male pedestrians have different perceptions while considering their mobility: analysing, in an innovative and disaggregated way, data collected from users can help to address the problems they commonly face while travelling. Proposal ameliorations in the pedestrian infrastructure and mobility policy are fundamental steps to present and future mobility planning in an inclusive society. If you ignore nearly half the population, you are not making a sustainable solution (Ramboll, 2021).

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References

Bernhoft, I.M., Carstensen, G., 2008. Preferences and behaviour of pedestrians and cyclists by age and gender. Transp. Res. Part F Traffic Psychol. Behav. 11. https://doi.org/10.1016/j.trf.2007.08.004

Bilin Han, B., Kim, J. and Timmermans, H., 2019. Task allocation and gender roles in dual-earner households: The issue of escorting children, Travel Behaviour and Society, Volume 14, Pages 11-20, ISSN 2214-367X, https://doi.org/10.1016/j.tbs.2018.09.001

Campisi, T., Basbas, S., Trouva, M., Papas, T., Akgün-Tanbay N., Stamatiadis, N., Tesoriere, G., 2022, Anxiety, fear and stress feelings of road users during daily walking in COVID-19 pandemic: Sicilian cities, Transportation Research Procedia, 62, 107-114, https://doi.org/10.1016/j.trpro.2022.02.014.

Carboni, A., Pirra, M., Costa, M., Kalakou, S., 2022. Active mobility perception from an intersectional perspective: insights from two European cities, in: Transportation Research Procedia. https://doi.org/10.1016/j.trpro.2021.12.072

Carboni, A., Pirra, M., Costa, M., Kalakou, S., 2021. Gender perceptions of active mobility: Insights from three European cities. Eur. Transp. - Trasp. Eur. 85, 1–14. https://doi.org/10.48295/ET.2021.85.9

CIVITAS, 2014. Gender equality and mobility: Mind the gap! European Union.

European Platform on Sustainable Urban Mobility Plans, 2020. COVID-19 SUMP Practitioner Briefing. London.

Goel, R., Oyebode, O., Foley, L., Tatah, L., Millett, C., Woodcock, J., 2022. Gender differences in active travel in major cities across the world. Transportation (Amst). https://doi.org/10.1007/s11116-021-10259-4

Hidayati, I., Tan, W., Yamu, C., 2020. How gender differences and perceptions of safety shape urban mobility in Southeast Asia. Transp. Res. Part F Traffic Psychol. Behav. 73, 155–173. https://doi.org/10.1016/j.trf.2020.06.014

International Transport Forum, 2018. Women's Safety and Security: A Public Transport Priority. Paris.

Lodovici, M.S., Pesce, F., Malgieri, P., Maffi, S., Rosa, C., 2012. The role of women in the green economy: the issue of mobility, European Parliament.

Padeiro, M., 2022. Cycling infrastructures and equity: an examination of bike lanes and bike sharing system in Lisbon, Portugal, Cities & Health, DOI: 10.1080/23748834.2022.2084589

Pirra, M., Kalakou, S., Carboni, A., Costa, M., Diana, M., Lynce, A.R., 2021. A preliminary analysis on gender aspects in transport systems and mobility services: Presentation of a survey design. Sustain. 13. https://doi.org/10.3390/su13052676

Pollard, T.M., Wagnild, J.M., 2017. Gender differences in walking (for leisure, transport and in total) across adult life: A systematic review. BMC Public Health. https://doi.org/10.1186/s12889-017-4253-4

Ramboll, 2021. Gender and (smart) mobility [WWW Document]. URL https://ramboll.com/-/media/files/rgr/documents/markets/transport/g/gender-and-mobility_report.pdf (accessed 3.30.21).

Sagaris, L, Tiznado-Aitken, I., 2020, Sustainable Transport and Gender Equity: Insights from Santiago, Chile. In Urban Mobility and Social Equity in Latin America: Evidence, Concepts, Methods (Transport and Sustainability, Vol. 12), Oviedo, D., Duarte, N.V. and Pinto, A.M.A. (Ed.) Emerald Publishing Limited, Bingley, 103-134. https://doi.org/10.1108/S2044-994120200000012009

Scheiner, J., Holz-Rau, C., 2017. Women's complex daily lives: a gendered look at trip chaining and activity pattern entropy in Germany. Transportation (Amst). https://doi.org/10.1007/s11116-015-9627-9

Singh, Y.J., 2020. Is smart mobility also gender-smart? J. Gend. Stud. 29. https://doi.org/10.1080/09589236.2019.1650728

Stark, J., Meschik, M., 2018. Women's everyday mobility: Frightening situations and their impacts on travel behaviour. Transp. Res. Part F Traffic Psychol. Behav. 54, 311–323. https://doi.org/10.1016/j.trf.2018.02.017

Tiikkaja, H., Liimatainen, H., 2021. Car access and travel behaviour among men and women in car deficient households with children, Transportation Research Interdisciplinary Perspectives, Volume 10, 100367, ISSN 2590-1982, https://doi.org/10.1016/j.trip.2021.100367.

Zhao, P., Wan, J., 2020. Examining the effects of neighbourhood design on walking in growing megacity. Transp. Res. Part D Transp. Environ. 86. https://doi.org/10.1016/j.trd.2020.102417