



Research Article

Gender differences in drivers' road risks and gender equality policies: A gender paradox? Comparative analysis of 39 countries[☆]

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ARTICLE INFO

Keywords:

Road safety
Gender differences
Cultural context
Gender paradox
Gender equality policies

ABSTRACT

Gender is an acknowledge factor in road traffic fatalities, with men far more likely to die in road traffic crashes than women. This study aims to determine whether gender differences in drivers' self-reported risk behaviours and psychosocial factors vary by country's gender equality policies. Using the third edition of the *E-Survey of Road users' Attitudes* database, we analysed gender differences in the behaviour and attitudes of 16,031 frequent drivers (54.46 % men) surveyed via an online questionnaire in 39 countries. We characterised these countries according to their level on the World Economic Forum's Global Gender Gap Index and its four sub-indices (economic, education, health and political). We analysed differences by driver gender, levels of the gender gap indices and their interactions, on reported behaviour, social and personal acceptability, self-efficacy, risk perception, support for road safety policies and perceived deterrence, controlling for driver age and country income level. The results show that men drivers tend to have riskier behaviours, attitudes and perceptions than women drivers, regardless of the level of gender equality in the countries studied. They also show that gender equality policies seem to increase the risky behaviours and attitudes of men and women drivers in the sample. Furthermore, greater gender policies do not appear to reduce gender differences in these psychological constructs. In particular, high levels of equality in the economic, educational and health seems to reinforce gender differences in attitudes and perceptions related to risky driving behaviour. We discuss this gender paradox as a result of the essentialisation of gender stereotypes and the impact of safety culture on men and women. These findings may be useful, particularly in a safe system approach to road safety, for better framing road safety campaigns and education.

1. Introduction

Road traffic accidents are the 12th leading cause of death worldwide [1], representing a significant public health issue. In this context, gender is an acknowledge factor, with men being three times more likely to die in road traffic crashes than women. For example, although men make up 49 % of the 27-nation European Union's population, they account for 76 % of road deaths [2,3]. Even when exposure is controlled for, men are more likely to be involved in road traffic crashes than women [4]. Although this gender gap has been observed for decades and appears to be a key factor in reducing road mortality through education, awareness raising and prevention. However, it has not really been taken into

account in the safe system approach to road safety policy, which is based on the principle that the user is always fallible and needs to be protected and helped to avoid making mistakes [5,6]. It therefore seems necessary and urgent to better understand the determinants of these gender differences in global road accident rates.

The observed gender differences in road crashes may be partly explained by the greater involvement of men in risky and offending behaviours [7–9], their greater sensation seeking [10] and their lower use of safety devices that could protect them (e.g., seat belts, helmets) [11,12]. It has been demonstrated that men are more inclined to perceive themselves as less vulnerable to risk than women, and to overestimate their driving abilities [13]. Men tend to perceive risky

[☆] This article is part of a Special issue entitled: 'ESRA3 survey results: Original Research' published in IATSS Research.

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<https://doi.org/10.1016/j.iatssr.2025.06.004>

Received 25 October 2024; Received in revised form 15 May 2025; Accepted 19 June 2025

Available online 17 July 2025

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behaviours as less serious than women [14,15], they are less concerned about the risks they face [16], or that they may confront others with [17], and therefore engage in such behaviours with greater frequency. Conversely, women demonstrate a greater concern for all road safety issues [8]. For example, they perceive greater risks in speeding [18,19] and using a mobile phone while driving [20].

The inclination of men to take risks has typically been explained by a convergence of biological and evolutionary theories [21]. It is hypothesised that men are more inclined to seek out sensations and assume risks than women, due to the production of higher levels of androgens [22] and/or the influence of their reproductive function [23]. Conversely, some studies highlight the fact that gender differences in road traffic may be attributable to gender roles and the process of gender socialisation that takes place from the earliest years of childhood [see 21 for a review]. The terms “gender roles” and “gender stereotypes” describe a set of social beliefs about the characteristics and behaviours that are typically associated with men and women in a given society [24]. Simon and Corbett [25] were the first, in 1996, to interpret gender differences in driving risk behaviour as reflecting gender role differences, with women's roles characterised by passivity, non-competitiveness and caution, and men's roles characterised by risk-taking, competitiveness and non-conformity. The norms of masculinity even prescribe the minimisation of danger and encourage reckless behaviour [20]. Then, men engage in risky behaviours to demonstrate their masculinity. This is achieved by adopting typical masculine behaviours, which deviate from the behaviours typically associated with femininity [26]. Indeed, cars and driving are essential to the construction of masculine identity [27]. Such activities permit the outward demonstration of aggressiveness and competitiveness, both of which are socially expected of men, while simultaneously being perceived as natural male behaviours in various countries [28–31]. Consequently, numerous studies have demonstrated that, irrespective of age, gender differences in risk-taking are predominantly attributable to individuals' endorsement to gender roles (masculinity and femininity) rather than to biological sex [32–35].

These psychosocial explanations suggest that gender differences may vary according to the roles that society expects women and men to fulfil. In particular, these gender roles vary by culture [36,37], i.e., the norms, stereotypes, beliefs, and values that characterise the members of a group and distinguish it from other groups [38]. Because gender roles vary across cultures, and therefore countries and societies, the behaviours expected of men and women may also vary. Indeed, the documented gender differences may not be universally applicable. For example, the assertion that women are more sensitive to risk and perceive higher road risks than men may be true in high-income countries but not always in low-income countries, according to Lund and Rundmo [39]. In low-income countries, where people are accustomed to risk, risk perception may be similar for men and women, showing that gender differences in risk perception may depend on the economic and cultural context [40]. An investigation into the variations in gender differences in economic and cultural contexts would provide support for psychosocial explanations of gender differences in driving behaviour, and demonstrate the importance of individual (especially men) endorsement of social beliefs as a factor in explaining gender differences in road crashes. A growing body of research has analysed cross-country differences in attitudes, perceptions, and behaviours of road users, with a particular focus on high- and low-income countries [41–44]. Nevertheless, to the best of our knowledge, no studies have yet attempted to compare gender differences in driver behaviours and attitudes in different economic and cultural contexts. Some studies examined the gender differences, yet they did so either at the country level without comparison between countries or for the entire sample, without considering the cross-country differences [45–48]. In some instances, the impact of culture on attitudes and behaviours is examined in cross-country comparisons while controlling for the influence of gender [49–52].

Several studies in other fields have demonstrated that gender differences can be influenced by economic and cultural factors, with some studies even yielding contradictory results. For instance, gender gaps in personality traits, visual-spatial abilities, or access to scientific disciplines are occasionally less pronounced in low-income countries than in high-income countries, where gender equality policies are more advanced, and gender roles are less distinct [53]. This gender paradox in relation to gender equality policies seems to be confirmed by a recent literature review [54], which lists studies on the links between gender differences in basic skills and personality and indicators of gender equality, using in particular the World Economic Forum's Gender Gap Index [55]. Researchers have found that in more egalitarian cultures, such as those of Western industrialised countries, individuals are more likely to attribute behaviour that aligns with the social norms of their gender group to personal characteristics rather than to gender norms and social roles. Consequently, gender differences in attitudes and behaviour are more likely to be perceived as free individual choices and therefore more acceptable in more egalitarian cultures [56]. The findings of Granié et al. [57] appear to corroborate this hypothesis, as they demonstrate that gender differences in reported behaviours and personal norms tend to be more pronounced in high-income countries than in low-income countries for four distinct risk behaviours (drink-driving, speeding, wearing a seat belt and using a mobile phone while driving). The researchers offered two explanations for this finding. The first is that in countries where gender equality is high, conforming to gender norms is perceived as a personal choice rather than a social obligation. The second is that women are more risk-averse the higher the level of safety in society. Nevertheless, the data analysed could not be tested directly for these explanations due to its division into cultural clusters. Thus, an in-depth exploration of the effects of income levels and equality policies in the different countries studied was not possible. Furthermore, the study only examined the interactions between gender and cultural clusters on personal and social acceptability that are likely to explain each of the four reported risk behaviours under investigation. However, a number of additional psychological factors that contribute to risk-taking behaviour, both regarding individual dispositions (e.g., feelings of driving self-efficacy) and in terms of perceptions and attitudes (e.g., support for road safety policies, risk perception) [58], are likely to exhibit variation based on gender and cultural background [16,59,60].

The aim of this study is to determine whether gender differences in risky behaviour reported by drivers vary according to the economic and cultural context and, in particular, according to the level of gender equality in the country. Based on the data in the literature, we hypothesise that (1) due to different societal expectations regarding the roles of men and women, the existence and extent of gender differences in risky behaviour and attitudes of drivers will vary according to the cultural context, and (2) gender differences in perceptions, attitudes and reported behaviour will be more pronounced in countries where gender equality is more advanced.

2. Method

This research explores cultural variations in gender differences in reported risky driving behaviours through secondary analysis of the *E-Survey of Road users' Attitudes* project database (ESRA). This exploration is not the primary objective of the ESRA project, which aimed to collect comparable international data on road users' opinions, attitudes, and behaviours towards road traffic risks. It is a joint initiative of road safety institutes, research organizations, public services, and private sponsors in 46 countries. The initiative is funded by the partners themselves. The data collection for the third edition of the ESRA survey (ESRA3) was conducted in 2023 in 39 countries across five continents.

2.1. Sample

The ESRA survey is a self-administered, online questionnaire

utilising an access panel of participants. Four market research agencies were responsible for the organisation of fieldwork and the administration of the survey to a representative sample (at least $N = 1000$) of the national adult population (aged 18 and above) in each participating country. However, in four countries (Armenia, Kyrgyzstan, Luxembourg, and Uzbekistan), the sample size was reduced to 500 respondents due to logistical constraints. The data were collected between May and September 2023. The ESRA3 survey yielded data from a total of 37,004 road users, of whom 51.3 % were female, across 39 countries.

The survey included all types of road users, including car drivers, cyclists, pedestrians, moped riders, and motorcyclists. To control for the effect of travel mode in this study, it was decided to focus on frequent car drivers. To this end, only those participants who stated that they had driven a car (conventional, electric or hybrid) at least four days a week over the previous 12 months were selected to take part in the study. This resulted in a sample comprising 43.3 % of the total number of participants (48.5 % of men and 38.4 % of women). Table 1 illustrates that the sample comprises 16,031 individuals, of whom 8732 are men and 7299 are women (representing 54.5 % and 45.5 % of the frequent driver sample, respectively). As illustrated in Table 1, the proportion of women and men among frequent drivers differs across countries. In several countries, the distribution is inequitable, with a larger proportion of men comprising the group of frequent drivers than women.

2.2. Procedure and measures

2.2.1. Measurement of risk behaviour and attitudes

The ESRA3 questionnaire was originally written in English by all ESRA3 partners and then translated into the national languages of each partner organisation [61]. It covers a range of road safety risk behaviours, including drink-driving, drug-driving, speeding, driving without a seatbelt or child restraint, fatigue and distraction (including mobile phone use and internet access while driving). The questionnaire measures several aspects of driver behaviour and attitudes, mostly using Likert scales. For this study of gender differences in driver behaviour and attitudes, we used seven variables present in the questionnaire.

Table 2 shows the different ESRA survey variables used in this analysis, examples of questions for each variable and the limits of the Likert scales used. Self-reported risk behaviour is measured by 15 questions covering 15 different risk behaviours, social acceptability of risk behaviour by five risk behaviours (five questions) and personal acceptability by 13 questions, each covering a different risk behaviour. Self-efficacy as a factor is measured by nine items and the perception of the risk of a crash is estimated for seven risk behaviours (seven items). Support for road safety policies is evaluated for six new road safety measures (six items) and perceived deterrence for five risk behaviours (five items). Further details on the items used can be found in ESRA 3 methodology report [61].

For each of the seven variables studied, the internal consistency of the scale was verified by calculating the Cronbach's alpha coefficient ($\alpha > 0.70$). As shown in Table 2, the Cronbach's alpha coefficients for the seven total scores calculated vary between 0.76 and 0.93, indicating that the scales have good overall reliability and that all elements of the scale can be retained. Aggregate scores were then computed by summing the scores obtained for each of the items making up the variable, with each item having the same weight in the aggregate score.

2.2.2. Measurement of the level of gender equality in the countries surveyed

As the analysis focuses on gender differences in attitudes and behaviours towards road risk, we propose to capture the economic and cultural context through the level of gender equality in each country studied. Several gender inequality indices have been developed over the past two decades (see 62). For example, the Gender Inequality Index (GII) developed by the United Nations Development Program [63] was first published in 2013. It is based on the idea that girls and women are too often discriminated against in health, education, and the labour

Table 1.

Number and percentage of men and women frequent drivers (at least 4 days per week) for each country and value of chi-square test for independence ($N = 16,031$).

Country		Number of Frequent drivers			Chi-square
		Gender		Total	
		Men	Women		
Armenia	<i>n</i>	74	14	88	58.495***
	% of sample	33.5	5.7	18.9	
Australia	<i>n</i>	211	248	459	4.357*
	% of sample	44.8	51.6	48.2	
Austria	<i>n</i>	449	406	855	13.63***
	% of sample	52	43.3	47.5	
Belgium	<i>n</i>	408	405	813	4.34*
	% of sample	47.9	43	45.4	
Bosnia and Herzegovina	<i>n</i>	246	230	476	22.523***
	% of sample	61.2	45.4	52.4	
Brazil	<i>n</i>	232	185	417	19.974***
	% of sample	51.7	37.2	44.1	
Canada	<i>n</i>	449	388	837	16.389***
	% of sample	48.9	39.7	44.1	
Chile	<i>n</i>	180	123	303	26.640***
	% of sample	41.4	25.4	32.9	
Colombia	<i>n</i>	124	80	204	13.137***
	% of sample	27.6	17.5	22.5	
Czech Republic	<i>n</i>	192	146	338	11.318***
	% of sample	40.3	29.9	35	
Denmark	<i>n</i>	216	189	405	4.339*
	% of sample	49.9	42.9	46.3	
Finland	<i>n</i>	211	163	374	16.547***
	% of sample	44.3	31.8	37.8	
France	<i>n</i>	241	219	460	2.191
	% of sample	50.1	45.3	47.7	
Germany	<i>n</i>	184	156	340	5.259*
	% of sample	44.9	37.1	40.9	
Greece	<i>n</i>	310	244	554	31.118***
	% of sample	65.8	48.1	56.6	
Ireland	<i>n</i>	251	242	493	1.882
	% of sample	57	52.5	54.7	
Israel	<i>n</i>	295	278	573	2.759
	% of sample	62.1	56.9	59.4	
Italy	<i>n</i>	357	290	647	14.571***
	% of sample	70	58.5	64.3	
Japan	<i>n</i>	184	154	338	6.009**
	% of sample	38.1	30.7	34.3	
Kazakhstan	<i>n</i>	120	38	158	55.040***
	% of sample	29.3	9	19	
Kyrgyzstan	<i>n</i>	89	18	107	58.748***
	% of sample	37.6	7.8	22.9	
Latvia	<i>n</i>	263	192	455	40.993***
	% of sample	61.2	39.9	49.9	
Luxembourg	<i>n</i>	165	143	308	2.865
	% of sample	69.3	61.9	65.7	

(continued on next page)

Table 1. (continued)

Country		Number of Frequent drivers			Chi-square
		Gender		Total	
		Men	Women		
Mexico	<i>n</i>	215	183	398	9.531**
	% of sample	48	38	42.8	
Netherlands	<i>n</i>	183	161	344	7.789**
	% of sample	42.9	33.8	38.1	
Panama	<i>n</i>	192	157	349	15.190***
	% of sample	47.9	34.7	40.9	
Peru	<i>n</i>	106	54	160	17.380***
	% of sample	24.5	13.2	19	
Poland	<i>n</i>	238	205	443	10.932***
	% of sample	53.5	42.6	47.8	
Portugal	<i>n</i>	317	291	608	14.540***
	% of sample	65.1	53.4	58.9	
Serbia	<i>n</i>	283	178	461	52.642***
	% of sample	58.7	35.6	46.9	
Slovenia	<i>n</i>	321	270	591	10.352***
	% of sample	67.6	57.4	62.5	
Spain	<i>n</i>	208	198	406	4.054*
	% of sample	47	40.4	43.5	
Sweden	<i>n</i>	174	143	317	7.290**
	% of sample	38.8	30.3	34.4	
Switzerland	<i>n</i>	212	187	399	2.002
	% of sample	43.1	38.6	40.9	
Thailand	<i>n</i>	178	146	324	3.639
	% of sample	40.8	34.5	37.7	
Turkey	<i>n</i>	216	176	392	4.068*
	% of sample	47.1	40.4	43.8	
United Kingdom	<i>n</i>	185	182	367	3.864*
	% of sample	43.5	37.1	40.1	
United States	<i>n</i>	217	211	428	0.568
	% of sample	47	44.5	45.7	
Uzbekistan	<i>n</i>	36	6	42	24.823***
	% of sample	16.9	2.7	9.7	
Total	<i>n</i>	8732	7299	16,031	381.453***
	% of sample	48.5	38.4	43.3	

****p* < .001 ***p* < .01 **p* < .05.

market, with negative consequences for their freedoms [64]. The GII measures the disadvantages faced by women in three areas: reproductive health, empowerment, and the labour market, and is based on five variables that distinguish inequalities between women and men. The Global Gender Gap Index (GGGI) was developed by the World Economic Forum (WEF) in 2006. It is based on the idea that gender inequalities are the result of a combination of socio-economic, political and cultural variables [55]. It measures gender inequalities in four domains, which in turn are calculated from 14 variables [62]. In this analysis, GGGI was preferred to GII because (1) it is more commonly used when studying the gender paradox in psychology [54], and (2) it takes into account more variables in the construction of the indices and distinguishes political participation from educational attainment, while these two dimensions are combined in the empowerment dimension of the GII. Differentiating these two aspects in their potential impact on attitudes and behaviours towards road risk may be of interest for this analysis.

The GGGI proposed by the WEF can theoretically vary from 0 (complete inequality) to 1 (complete equality between women and men) [55]. In the country sample under examination, the GGGI 2023 varies from 0.668 in Turkey to 0.912 in Finland. The GGGI is based on four gender gap sub-indices (GGS), all varying between 0 and 1, illustrating the progress made in achieving equality between men and women in four areas. The sub-indices measure the gender gap in terms of health (GGS-health: the men/women ratio at birth and the gender gap in healthy life expectancy; varying in our sample from 0.955 in Armenia to 0.980 in Brazil), political empowerment (GGS-polit: the men/women ratio in ministerial and parliamentary positions and years of women in the national executive, from 0.057 in Japan to 0.700 in Finland), educational attainment (GGS-edu: the men/women ratio in primary, secondary and tertiary education, from 0.960 in Peru to 1 in 16 countries of our sample), and economic participation and opportunities (GGS-eco: wage levels and gender gaps in career advancement, from 0.500 in Turkey to 0.795 in Sweden). It was not possible to retain Uzbekistan for further analysis due to the lack of data on all the relevant gender gap indices. The following analyses were therefore carried out on 38 of the 39 countries in the ESRA3 sample.

2.3. Analysis

A series of analyses of covariance (ANCOVAs) were conducted to evaluate the impact of gender, GGGI and the four GGS, as well as their interaction, on each aggregated score previously outlined. It is important to note that all analyses were conducted on individual raw data, rather than on country means. As the impact of age on driver perceptions, attitudes and behaviour has already been well documented in the literature [65], the analysis was carried out controlling for the effect of age (six modalities: 18–24, 25–34, 35–44, 45–54, 55–64, 65–74), country (38 modalities, to control for the effect of national sample sizes) and country income level (two modalities: 1 = Low- and Middle-Income Countries, 2 = Upper Middle-Income Countries and High-Income Countries), based on the World Bank's classification [66]. It should be noted that a weighting of the data was applied in the analyses. This weighting took into account minor adjustments to ensure national representativeness of the sample with respect to gender and six age groups described above [67].

As there were 35 comparisons (seven variables of interest on each of the GGGI and the four GGS) by gender and gender index level, a Bonferroni correction was applied. At $\alpha = 0.05$, a level of $p < .001$ (0.05/35) was considered the cut-off for significance for ANCOVAs and post-hoc tests. Although three levels of significance are described in the tables, only statistically significant differences at $p < .001$ are described and discussed in the following section. To interpret the statistically significant main and interaction effects, post-hoc pairwise comparisons were calculated between the estimated marginal means for the main effects in the model with Bonferroni's confidence interval adjustment.

For each statistically significant difference revealed by the F test, we report the partial eta square (η_p^2) value as a measure of effect size. Partial eta squared calculates the proportion of variance in the variable of interest that is explained by each of the factors examined (gender groups and gender equality indices) and not explained by the covariates (age, country and country income level). Cohen's rules of thumb for interpreting this effect size indicator are as follows: the statistically significant difference is considered small if $\eta_p^2 \leq 0.01$, medium if $0.01 \leq \eta_p^2 \leq 0.06$ and large if $0.06 \leq \eta_p^2 \leq 0.14$ [68].

We analysed the main effects and interaction effects of gender groups and gender equality indices. A statistically significant main effect of gender group means that the difference between men and women is significant for the whole sample, regardless of the level of the gender equality index. A statistically significant main effect of gender equality index means that there is a significant difference between gender equality index levels for the whole sample, regardless of gender groups. A significant interaction effect between gender and gender equality

Table 2.

Variables examined, number of items, item code, question asked, likert scale used, and cronbach's alpha coefficient for each aggregated score.

Aggregated Score Name	Nb. of items	Item's Code in the ESRA Survey	Question asked	Likert scale	Cronbach's α
Self-declared Risky Behaviours	15	Q14_1a_1 to Q14_1a15	"Over the last 30 days, how often did you as a car driver...?"; 15 risky behaviours (e.g., "drive after drinking alcohol", "drive faster than the speed limit inside built-up areas"). "Where you live, how acceptable would most other people say it is for a car driver to...?"	From 1: never to 5: almost always	0.89
Social Acceptability	5	Q15_1 to Q15_5	5 risky behaviours (e.g., "drive without wearing the seatbelt", "talk on a hand-held mobile phone while driving") "How acceptable do you, personally, feel it is for a car driver to...?"	From 1: unacceptable to 5: acceptable	0.83
Personal Acceptability	13	Q16_1_1 to Q16_1_13	13 risky behaviours (e.g., "drive within 2 h after taking a medication that may affect the driving ability", "read a message or check social media/news while driving") "To what extent do you agree with each of the following statements?"	From 1: unacceptable to 5: acceptable	0.88
Self-efficacy	9	Q17_7 to Q17_15	9 statements (e.g., "I have the ability to drive when I am a little drunk after a party", "I am able to drive fast through a sharp curve") "How often do you think each of the following factors is the cause of a road crash involving a car?"	From 1: disagree to 5: agree	0.84
Risk Perception	7	Q19_1 to Q19_7	7 behaviours (e.g., "using a hand-held mobile phone while driving", "driving while tired") "Do you oppose or support a legal obligation ...?"	from 1: never to 6: (almost) always	0.93
Support for Road Safety Policies	6	Q20_1 to Q20_3, Q20_5 to Q20_7	6 measures presented (e.g., "forbidding all drivers of motorized vehicles to drive with a blood alcohol concentration above 0.0 ‰ (zero tolerance)", "limiting the speed limit to a maximum of 80 km/h on all rural roads without a median strip") "On a typical journey, how likely is it that you (as a car driver) will be checked by the police (including camera or radars) for ...?"	From 1: oppose to 5: support	0.76
Perceived Deterrence	5	Q22_1 to Q22_5	5 road rules (e.g., "respecting the speed limits", "the use of illegal drugs")	From 1: very unlikely to 5: very likely	0.85

index means that the difference between the two gender groups varies across gender equality index levels. Only statistically significant effects are described and discussed.

To carry out these analyses, the GGGI and each of the GGS of equality between women and men was transformed into categorical variables. This choice was made to observe non-linear relationships between the level of gender equality and the variables of interest. Indeed, numerous studies point out that the relationship between economic development and inequality (income or gender) could be non-linear at different levels of development [69]. Empirical work in economics tends to show that the negative relationship between growth and income inequality is only observed below a certain threshold of per capita income [70], and this non-linear relationship also seems to exist between economic development and gender equality [71]. The GGGI and the GGS for the economy (GGS-eco), health (GGS-health) and politics (GGS-polit) were divided into three categories, with low scores assigned a value of 1, medium scores a value of 2 and high scores a value of 3. Each category comprised approximately 30 % of the total sample. The education sub-indices (GGS-edu) could only be dichotomised (low score = 1 and high score = 2) due to the limited variability observed in the sample (16 countries out of 38 obtained a score of 1). Appendix A shows the distribution of the 38 remaining countries in the sample (excluding Uzbekistan) in the different categories for the GGGI and the four GGS.

3. Results

The objective of this study was to analyse and evaluate the potential variation in the gender distribution of our sample of drivers according to the level of the GGGI and the four GGS. The chi-square analysis demonstrated that the proportion of women drivers exhibited a statistically significant variation according to the GGGI and three of the four GGS (see Table 3). The proportion of women increased with the level of GGGI and GGS-polit, but decreased with the level of GGS-health and they were under-represented at the high level of GGS-edu. The distribution of men and women drivers did not vary significantly according to the levels of the GGS-eco.

Table 3.

Proportion of men and women drivers as a function of the level of the GGGI and the four GGS, Chi-square value and significance.

Indices	Levels	Gender		Chi-square
		Men	Women	
GGGI	Low	55.65	44.35	13.73*
	Medium	54.90	45.10	
	High	52.26	47.74	
GGS-eco	Low	55.53	44.47	4.51
	Medium	54.12	45.88	
	High	53.54	46.46	
GGS-edu	Low	53.65	46.35	4.19*
	High	55.27	44.73	
GGS-health	Low	53.16	46.84	12.99**
	Medium	54.38	45.62	
	High	56.63	43.37	
GGS-polit	Low	55.75	44.25	6.75*
	Medium	53.85	46.15	
	High	53.39	46.61	
Total		54.39	45.61	

*** $p < .001$ ** $p < .01$ * $p < .05$.

The objective of the series of ANCOVAs was to examine the influence of gender group, the GGGI and the four GGS and their interaction on the seven variables of interest. Table 4 presents the F values for gender, GGGI, and their interaction for each ANCOVA, after controlling for age, country and country income level. The analyses demonstrated a significant main effect of gender for all variables and a significant main effect of GGGI level for social and personal acceptability, self-efficacy and support for road safety policies. The results indicated that men exhibited significantly higher levels of self-reported risky behaviour, social and personal acceptability, self-efficacy, and perceived deterrence than women. Conversely, women demonstrated significantly higher levels of support for road safety policies and risk perception than men. The Bonferroni post hoc tests showed that the social acceptability score and the support for road safety policy score decreased significantly from low to medium and high levels (both $p < .001$). The personal acceptability

Table 4.

F values (and η_p^2 when $p < .001$) for each ANCOVA for the two gender groups according to GGGI levels for the seven variables of interest, after controlling for age, country and country income level.

	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Deter.
Gender	253.80*** (0.016)	73.60*** (0.005)	241.05*** (0.015)	517.85*** (0.031)	83.37*** (0.005)	423.29*** (0.026)	91.21*** (0.006)
GGGI	3.85*	63.44*** (0.008)	12.42*** (0.002)	9.23*** (0.001)	6.46**	10.63*** (0.001)	4.91**
Interaction	2.66	1.86	0.84	4.01*	1.39	3.01*	9.53*** (0.001)

*** $p < .001$ ** $p < .01$ * $p < .05$.

score and the self-efficacy score decreased significantly from low to medium levels of GGGI (both $p < .001$) but were not significantly different between low and high levels. Furthermore, the analyses demonstrated a statistically significant interaction between gender and GGGI with respect to the perceived deterrence score. The gender difference was significant in the low GGGI level ($p < .001$) and in the medium GGGI level ($p < .001$) but not in the high GGGI level ($p = .025$). This change can be explained by the fact that the perceived deterrence score for men decreased, while the deterrence score for women increased, between the medium and high GGGI levels. The means (and standard deviations) for the two gender groups according to the three GGGI levels for the seven variables of interest are presented in Appendix B.1.

Subsequently, a series of ANCOVAs were conducted on the four GGS that comprise the GGGI. This was done to ascertain which aspects of gender equality contributed to the observed differences between the two gender groups.

Table 5 shows the F values for gender, GGS-eco and their interaction for each ANCOVA, after controlling for age, country and country income level. As would be expected, the same gender differences were evident here as were observed in the previous ANCOVA. The analyses also showed a main effect of GGS-eco level for all variables. Bonferroni post hoc tests showed that the scores for self-reported risk behaviour, social and personal acceptability, and risk perception were higher at the medium GGS-eco level than at the low and high GGS-eco levels, and that the score for support for road safety policy was lower at the medium level than at the other two levels (for all variables, $p < .001$). They also showed a significant decrease in the perceived deterrence score between the low level and the medium and high levels, and a significant increase in the self-efficacy score between the low and medium levels (for all variables, $p < .001$). The results also showed a significant interaction between gender and GGS-eco with regard to personal acceptability, self-efficacy and support for road safety policy scores, with difference between men and women more pronounced in the high GGS-eco group than in the other two groups (for all variables, $p < .001$). With regard to personal acceptability and self-efficacy, this increase in the gap was associated with a more pronounced decrease in the score for women than for men between the medium and the high GGS-eco levels. In the case of support for road safety policies, this increase in the gap was due to a more pronounced increase in the score for women than for men between the medium and the high GGS-eco levels. The means (and standard deviations) for the two gender groups according to the three GGS-eco levels for the seven variables of interest are presented in Appendix B.2.

Table 6 shows the F values for gender, GGS-edu and their interaction for each ANCOVA, after controlling for age, country and country income level. As would be expected, the same main effect of gender was

observed for all variables as in the previous ANCOVAs. The analyses also showed a main effect of GGS-edu level for four variables. The Bonferroni post hoc tests showed that the high GGS-edu group had significantly higher levels of personal acceptability and risk perception than the low GGS-edu group. Conversely, the low GGS-edu group had significantly higher levels of support for road safety policies and perceived deterrence than the high GGS-edu group. Furthermore, the analyses indicated significant interactions between gender and GGS-edu for self-efficacy and support for road safety policies. For these two variables, the gender difference was more pronounced in the high than in the low GGS-edu levels. This increase in the gender gap can be attributed to an increase in the score for men and a decrease in the score for women in the high GGS-edu level compared to the low level for self-efficacy and a more pronounced decrease in the score for men than for women for support road safety policies. The means (and standard deviations) for the two gender groups according to the two GGS-edu levels for the seven variables of interest are presented in Appendix B.3.

Table 7 shows the F values for gender, GGS-health, and their interaction for each ANCOVA, after controlling for age, country, and country income level. As expected, the main effect of gender was consistent across all variables, consistent with the results of previous ANCOVAs. The analyses also showed a main effect of GGS-health level for six variables. The Bonferroni post hoc tests showed that the scores for self-reported risky behaviour and personal acceptability were significantly lower in the low than in the medium and high GGS-health levels (for all variables, $p < .001$) and in the low than in medium GGS-health level for self-efficacy (for all variables, $p < .001$). In addition, the analyses indicated significantly higher scores in the medium GGS-health level compared to the other two groups for social acceptability and significantly lower scores in the medium GGS-health level compared to the other two groups for road safety policy support and perceived deterrence (for all variables, $p < .001$). The analyses also indicated a statistically significant interaction between gender and GGS-health with regard to perceived deterrence. This interaction showed that the gender difference was significantly greater in the high GGS-health group than in the other two levels ($p < .001$). This widening of the gender gap was due to a greater increase in the scores for men than for women between the medium and high levels of GGS-health, after a greater decrease in the scores for women than for men between the low and medium levels of GGS-health. The means (and standard deviations) for the two gender groups according to the three levels of GGS-health for the seven variables of interest are presented in Appendix B.4.

Table 8 shows the F values for gender, GGS-polit, and their interaction for each ANCOVA, after controlling for age, country, and country income level. As in the previous ANCOVAs, the results showed a main effect of gender for all variables. The analyses also showed a main effect of GGS-polit level for five variables. The Bonferroni post hoc tests

Table 5.

F values (and η_p^2 when $p < .001$) for each ANCOVA for the two gender groups according to GGS-eco levels for the seven variables of interest, after controlling for age, country and country income level.

	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Deter.
Gender	256.79*** (0.016)	72.46*** (0.005)	242.89*** (0.015)	509.24*** (0.031)	84.44*** (0.005)	428.73*** (0.026)	97.08*** (0.006)
GGS-eco	15.35*** (0.002)	65.18*** (0.008)	69.73*** (0.009)	8.26*** (0.001)	25.45*** (0.003)	172.99*** (0.021)	29.81*** (0.004)
Interaction	3.94*	2.56	7.38*** (0.001)	9.11*** (0.001)	2.35	10.63*** (0.001)	1.62

*** $p < .001$ ** $p < .01$ * $p < .05$.

Table 6.

F values (and η_p^2 when $p < .001$) for each ANCOVA for the two gender groups according to GGS-edu levels for the seven variables of interest, after controlling for age, country and country income level.

GGS-edu Level	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Deter.
Gender	251.06*** (0.015)	74.06*** (0.005)	238.69*** (0.015)	522.72*** (0.032)	87.25*** (0.005)	427.02*** (0.026)	95.73*** (0.006)
GGS-edu	4.37*	0.16	50.77*** (0.003)	0.02	47.91*** (0.003)	78.66*** (0.005)	98.72*** (0.006)
Interaction	0.57	2.08	1.84	14.15*** (0.001)	2.24	17.88*** (0.001)	7.69**

*** $p < .001$ ** $p < .01$ * $p < .05$.

Table 7.

F values (and η_p^2 when $p < .001$) for each ANCOVA for the two gender groups according to GGS-health levels for the seven variables of interest, after controlling for age, country and country income level.

	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Deter.
Gender	245.09*** (0.015)	58.76*** (0.004)	218.82*** (0.014)	470.55*** (0.029)	82.45*** (0.005)	386.69*** (0.024)	123.27*** (0.008)
GGS-health	15.17*** (0.002)	62.42*** (0.008)	30.80*** (0.004)	16.52*** (0.002)	4.69**	21.95*** (0.003)	26.35*** (0.003)
Interaction	0.76	1.90	0.29	0.24	0.53	2.71	15.21*** (0.002)

*** $p < .001$ ** $p < .01$ * $p < .05$.

Table 8.

F values (and η_p^2 when $p < .001$) for each ANCOVA for the two gender groups according to GGS-polit levels for the seven variables of interest, after controlling for age, country and country income level.

GGS-polit Level	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Deter.
Gender	257.41*** (0.016)	71.30*** (0.004)	235.08*** (0.014)	508.64*** (0.031)	56.13*** (0.005)	426.20*** (0.026)	91.79*** (0.006)
GGS-polit	4.11*	10.77*** (0.001)	5.61**	19.59*** (0.002)	16.63*** (0.002)	143.45*** (0.018)	17.69*** (0.002)
Interaction	0.51	1.28	1.96	6.67*** (0.001)	5.26**	0.94	8.04*** (0.001)

*** $p < .001$ ** $p < .01$ * $p < .05$.

showed that social acceptability scores significantly decreased while perceived deterrence scores significantly increased between medium and high GGS-polit levels for (for all variables, $p < .001$). Risk perception scores were significantly higher while road safety policy support scores were significantly lower in the medium GGS-polit group than in the other two groups (for all variables, $p < .001$). In addition, self-efficacy scores significantly increased between the low and the medium GGS-polit levels ($p < .001$). The analyses also showed significant interactions between gender and GGS-polit for self-efficacy and perceived deterrence. The Bonferroni post hoc tests showed that for self-efficacy, the gender difference was greater in the medium GGS-polit group than in the other two groups ($p < .001$), which can be attributed to a greater increase in scores for men than for women in the medium group compared to the low GGS-polit group. For perceived deterrence, gender differences decreased as the level of GGS-polit increased ($p < .001$), associated with a more pronounced increase in scores for women compared to men between low and high levels of GGS-polit. The means (and standard deviations) for the two gender groups according to the three levels of GGS-polit for the seven variables of interest are presented in Appendix B.5.

4. Discussion

The aim of this article was to investigate whether gender differences in risky driving behaviour and certain associated psychosocial factors vary according to different economic and cultural contexts, particularly with regard to gender equality policies. In line with the literature on gender roles, we hypothesised that differences between men and women would vary according to economic and cultural context and that these differences would be more pronounced in more egalitarian cultural contexts [57].

In general, the results highlighted the gender aspect of driving. Firstly, the proportion of women drivers varied according to the country studied and was always lower than that of men drivers. While this difference was observed in American (Brazil, Canada, Chile, Colombia) and European countries (Belgium, Finland, Greece, Italy, Netherlands,

Portugal) countries, it was particularly pronounced in countries of the former Soviet bloc (Bosnia-Herzegovina, Kazakhstan, Kyrgyzstan, Latvia, Serbia), where frequent drivers often represented a small proportion of the sample. These results confirm that the frequency of car use increases with the income level of a country and the quality of its infrastructure [72]. The large proportion of countries in which this gender difference is observed among frequent drivers seems to support the fact that in many countries driving is primarily a male activity, while women are more likely to be vehicle passengers or to use alternative modes of transportation [73]. The fact that this difference is not observed in all countries also shows that this association of driving with gender is more or less strong depending on the economic and cultural context. Secondly, the proportion of women drivers surveyed also varies according to countries' gender equality policies, but not always in the same direction. For example, while the proportion of women drivers increases in countries with high global gender equality policies (measured here by the GGGI), especially when women's participation in political life (measured here by the GGS-polit) is higher, this proportion is also higher in countries with lower levels of gender equality in health (GGS-health) and education (GGS-edu). This could be due to the fact that women in the countries with the most advanced levels of education and health care are more likely to be passengers, or to give up driving and rely on alternative transportation modes, but the reasons for these differences according to the area of gender equality would need to be analysed in depth in future studies.

To test the hypotheses of this study more directly, ANCOVAs on differences by gender group and equality level were performed on the different variables measuring drivers' reported risk behaviours and related psychosocial factors. These analyses were carried out for the five equality indices used: the global index (GGGI) and its four sub-indices (GGS), controlling for the effects of driver age, country and country income level. Controlling for these variables allows this study to analyse the significant effects of gender, the level of gender equality and their interaction on the behaviours and attitudes towards road risk presented, while controlling the potential effects of age and economic level of the countries studied.

Firstly, the results show differences between the two gender groups for all the variables studied, regardless of the country's level of gender equality, the driver's age and the country's income level. Men report riskier driving behaviour, higher social and personal acceptability and self-efficacy, and a greater perception of deterrence than women, while women perceive more risk and are more supportive of road safety policies. This result confirms all available literature on drivers [7,13,16,20] and supports that these differences, although systematic, are always small for the variables measured (effect sizes for gender vary from 0.005 for social acceptability to 0.031 for self-efficacy and are therefore considered small) as in the previous study [57]. These findings, which show that risk behaviours and attitudes are more prevalent among men in all regions of the world and regardless of the level of gender equality, also support the hypothesis of more stable and generalised gender differences across cultures. This could be explained either by the biological and physiological components of gender differences [74] or by a global valorisation of risky behaviour among men [75]. These two explanations support the idea of a dual risk factor among men, linked to social and cultural gender, but also to biological sex [76].

Secondly, the results indicate that the variables studied are influenced by the gender equality indices, regardless of the driver's gender and age, or the country's income level. Paradoxically, the behaviour and attitudes of frequent drivers do not become more pro-safety as the equality index increases. More specifically, the results often show a contrast in scores between the medium level of equality and the low and high levels. For example, increasing the GGGI from the medium to the high level seems to have a negative effect on the relationship with risk for men and women observed in this study, with the scores of participants in the high GGGI level being relatively similar to those of participants in the lowest level for the personal acceptability of risky behaviours and for self-efficacy. Similarly, the four GGS sub-indices do not ultimately improve drivers' relationship with road risk. In fact, drivers in the high levels have scores very close to those in the low levels, while drivers in the medium levels most often have riskier behaviours and attitudes than those in the other two levels. Overall, gender equality policies do not appear to improve, and may even worsen, the risky behaviour and attitudes of frequent drivers in the sample. These elements are important to understand better in a safe system approach to road safety, as they are likely to show how public policies to improve gender equality can interact with road safety policies. New research is needed to identify factors that interact directly or indirectly with policies aiming at improving women's situations in areas such as health, education, the labour market, and politics and prevent them to negatively affect the driver-risk relationship for both sexes.

Finally, we expected gender differences to vary according to different economic and cultural contexts, particularly with regard to gender equality policies. Although we observe interactions between gender and gender equality indices, these interactions do not concern all the variables studied.

First, the results show no significant interaction between gender and gender equality indices for the social acceptability of risky behaviour, risk perception and self-reported behaviour. Confirming the results of Granié et al. on social acceptability [57], for these variables there are no significant variations in the gender difference observed according to the level of gender equality, either for the GGGI index or for the four sub-indices GGS that make it up. Thus, self-reported behaviour and social acceptance of risky behaviour are higher among male drivers than among female drivers, while risk perception is higher among women, regardless of the level of gender equality in the country and without any variation according to economic and cultural context. These variables measure, in part, the degree of acceptance of these risky behaviours that participants perceive among their peers, i.e., the descriptive and prescriptive social norm regarding road risks. The results show that although men perceive greater social acceptance of risk than women, this gender gap does not vary according to gender roles in each cultural context. This reflects a dual positioning of individuals: in relation to

social norms of driving behaviour (the degree to which individuals conform to social norms of driving behaviour), but also in relation to social norms of gender roles (the degree to which individuals conform to gender roles in their culture) [57].

Second, the impact of equality indices on gender differences varies according to the variables measured. For three variables, the gender differences increase with the increase of gender equality sub-indices:

- Personal acceptability: Gender differences are more pronounced as GGS-eco increases, accompanied by a decrease in women's scores.
- Self-efficacy: Gender differences are greater when GGS-eco and GGS-edu are high and when GGS-polit is medium. This increase in differences is associated with:
 - o A decrease in women's scores for GGS-eco and GGS-edu.
 - o An increase in men's scores for GGS-edu and GGS-polit.
- Road safety policies: Gender differences are more pronounced as GGS-eco and GGS-edu increase. This increase in differences is associated with:
 - o A decrease in women's scores for GGS-eco.
 - o A decrease in the men's score for GGS-edu.

For the perceived deterrence score, the gender difference increases with the increase of GGS-health, with men's scores increasing at high levels of equality, but the gender difference decreases with the increase in GGGI and GGS-polit, associated with an increase in the score for women between the medium and high levels. Perceived deterrence is the only variable for which this interaction generally leads to a decrease in the gender gap as the level of equality increase.

Overall, most of the interactions between gender and equality indices show an increase in the gender gap when equality indices are higher, mainly in support for road safety policies and self-efficacy, especially in relation to the level of gender equality in the economic and educational spheres. The widening of these gaps is mainly due to the reinforcement of the stereotypical risk-averse positions of women, sometimes accompanied by the reinforcement of the stereotypical risk-taking positions of men, particularly in economic and cultural contexts where women are well integrated into the labour force (GGS-eco) and benefit from an education that is as advanced as that of men (GGS-edu). This widening of gender gaps with the increase in gender equality policies shows that the phenomenon of the gender paradox can also be observed in the field of road risk, confirming the initial findings of Granié et al. [57]. As suggested by Granié et al. [57], these results can be interpreted in two complementary ways. First, in the most egalitarian countries, which are often more individualistic, they may be the consequence of a perception of gender role conformity as linked to individual characteristics rather than social norms [56]. The consequence of this type of internal attribution may be the essentialisation of gender differences, which are then explained in terms of differences in nature rather than culture. Second, in more egalitarian countries, which are often wealthier, safer and less accustomed to risk [39], these results may also be the consequence of an increase in risk avoidance among women and a simultaneous maintenance of risk valuation among men. These two explanations, the effect of individualism and the effect of safety in more gender-equal countries, both question the existence and justification of gender roles and may prove to be complementary, and future research is needed to understand the reasons for this gender paradox in the area of road risk.

However, there are a number of limitations to this analysis that need to be noted in order to properly understand the results. Firstly, this is a secondary analysis of data that was not collected for the purpose of this study. Ad hoc data collection would, for example, make it possible to measure endorsement of gender stereotypes, its variability according to levels of gender equality, and to test this endorsement as a moderator of the relationship between gender equality and gender differences. Secondly, the gender equality indices were discretised to examine possible variable relationships according to the level of the indices. While this

has allowed to show here that this variability does not necessarily associate better gender equality with safer behaviour, future studies on this topic should allow to maintain the fineness of the equality indices used. In addition, we used composite scores constructed from the different items, considering that each item has the same weight in the construct. These composite scores made it possible to study the interactions using parametric statistical tests. However, it is not certain that all items contribute in the same way to the measured variables. Furthermore, in this analysis, the effect of culture on gender differences is only examined through the statistical interactions between the gender group and the levels of gender equality measured by different statistical proxies. These indices alone are not sufficient to define and differentiate cultural contexts. Other data, such as those from the World Values Survey, which periodically explores cultural values and changes using the Portrait Values Questionnaire from the Schwarz model [77], or the six dimensions of culture measured in more than 100 countries based on Hofstede's model [78], or even the Gender Social Norms Index [79], could usefully be mobilised to differentiate cultural contexts more finely. Lastly, it is important to note that self-reported data are subject to a number of biases [80,81], including desirability bias (i.e., the tendency of respondents to give answers that present a favourable image of themselves), and the literature shows that this bias is more pronounced in women than in men [82]. In the specific area of driving behaviour, both men and women may be reluctant to admit to offending driving behaviour. On the contrary, men may find it more socially desirable to report behaviour that is riskier than reality in order to demonstrate 'typically masculine' behaviour. Although this can itself be considered a gender role effect that also affects observable behaviour [83,84], future studies should seek to further control for desirability bias.

5. Conclusion

The objective of this paper was twofold. The initial objective was to demonstrate that the discrepancies between men and women drivers with regard to road risk are socially constructed and contingent upon the specific economic and cultural context. Secondly, it was aimed at demonstrating that these gender differences were reinforced by gender equality policies, thus exemplifying the phenomenon of the gender paradox. The results demonstrate that gender differences are already observable in the proportion of frequent drivers in the countries under investigation, and that this proportion is also influenced by the level of gender equality in the country. Additionally, male drivers tend to exhibit riskier behaviours, attitudes, and perceptions than female drivers, regardless of the age and gender equality levels of the countries under investigation. Furthermore, the degree of equality between men and women in a given country affects drivers' behaviours, perceptions, and attitudes. Finally, gender equality policies do not have the effect of reducing gender differences in these psychological constructs. Increased gender equality, particularly in economic terms, but also in education and health, seems to reinforce rather than diminish gender differences in attitudes and perceptions related to risky driving behaviour.

Our results show that gender differences in road risk behaviour and attitudes are observed in all the countries studied but vary according to the public policies on gender equality that have been put in place. In this respect, the findings highlight that gender plays a significant role in the variability of risk behaviour and compliance. This influence is not solely attributable to biological differences between men and women but is also shaped by social and cultural factors. Consequently, public road safety education, awareness, and prevention policies should place greater emphasis on gender dynamics, particularly by addressing gender roles and stereotypes associated with masculinity. Integrating these considerations is essential to fostering safer behaviours and reducing

road risks.

However, risky behaviour, errors and transgressions by users are only the result of a causal chain. Overestimating the responsibility of the user means running the risk of not taking action at higher levels of decision making and systemic failures (see 6). In a safe system approach, all road safety professionals and stakeholders have a responsibility to create favourable conditions for compliance with road safety rules. Our results show that road safety policies should not only integrate the gender dimension of user behaviour to address the social construction of these gender differences throughout the life course, but also take into account their interactions with other public policies on public health, mobility and gender equality, which can either support or, on the contrary, hinder the road safety policies put in place.

These findings are useful for road safety prevention and education, both in countries where gender equality is low and in countries where it is high, since they demonstrate that gender differences in road risk are resistant to policies aimed at improving equality between women and men. The essentialisation of gendered positions, both among women due to the legitimisation of their aversion to risk and among men due to the quest to maintain a social image of masculinity, is likely to impede efforts to reduce the high over-representation of men in fatal accidents. It may be necessary to ensure that women's need for emancipation, through education, health, economic and political participation, is not lead to the masculinisation of women's positions, but rather to the feminisation of men's positions.

CRedit authorship contribution statement

Marie-Axelle Granié: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. **Julie Devif:** Writing – review & editing, Formal analysis. **Nathalie Moreau:** Writing – review & editing. **Shirley Delannoy:** Writing – review & editing.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the authors used DeepL Translate and DeepL Write to improve readability and language refinement. After using these tools, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Funding

ESRA is funded through the contributions of partner organizations, either from their own resources or from sponsoring. Part of the funding for the Université Gustave Eiffel is provided by the Road Safety Department of the French Ministry of the Interior. Part of the funding for the Vias institute is provided by the Belgian Federal Public Service Mobility and Transport.

Declaration of competing interest

None.

Acknowledgements

This research was carried out as part of the third edition of the ESRA (*E-Survey of Road users' Attitudes*) project, a joint initiative of road safety institutes, research institutions, public services and private sponsors from around the world, coordinated by the VIAS Institute.

Appendix A

Table A.1

Distribution of the 38 Countries according to the GGGI level (3 Categories) in the GGS-eco (3 Categories), GGS-edu (2 Categories), GGS-health (3 Categories) and GGI-polit (3 Categories) Levels.

GGGI	Country	GGS-eco	GGS-edu	GGS-health	GGI-polit
1	Armenia	2	2	1	1
	Austria	2	1	2	2
	Bosnia and Herzegovina	1	1	2	1
	Brazil	1	1	3	1
	Czech Republic	1	2	3	1
	Greece	1	1	1	1
	Israel	2	2	1	1
	Italy	1	1	1	1
	Japan	1	1	3	1
	Kazakhstan	3	2	3	1
	Kyrgyzstan	2	2	3	1
	Panama	1	1	3	1
	Poland	2	1	3	1
	Thailand	3	1	3	1
2	Turkey	1	1	1	1
	Canada	3	2	1	2
	Chile	1	1	2	3
	Colombia	1	2	3	2
	France	2	2	2	2
	Luxembourg	2	2	1	2
	Mexico	1	1	3	3
	Netherlands	1	2	1	3
	Peru	1	1	1	3
	Portugal	3	1	3	2
	Serbia	2	2	2	2
	Slovenia	3	2	2	2
	United States	3	1	2	1
3	Australia	3	1	1	2
	Belgium	2	2	1	3
	Denmark	2	1	1	2
	Finland	3	2	2	3
	Germany	1	1	2	3
	Ireland	3	2	1	3
	Latvia	3	2	3	2
	Spain	2	1	1	3
	Sweden	3	2	1	3
	Switzerland	2	1	1	3
	United Kingdom	3	2	1	3

Note. For each categorisation: 1 = low level of equality, 2 = medium level of equality, and 3 = high level of equality; except for the GGS-edu where 1 = low level of equality, and 2 = high level of equality.

Appendix B. Descriptive statistics for the two gender groups according to the 5 gender equality indices used for the seven variables of interest

Table B.1

Mean values (and standard deviation) for the two gender groups according to GGGI levels for the seven variables of interest.

Gender	GGGI Level	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Deterr.
Men	Low	22.83 (7.83)	8.87 (4.28)	21.74 (8.43)	16.43 (7.24)	27.38 (10.56)	22.20 (5.63)	15.66 (8.57)
		22.74 (8.40)	8.23 (3.94)	21.31 (8.14)	16.33 (7.15)	27.07 (10.23)	21.99 (6.04)	14.72 (8.15)
	High	21.99 (8.28)	8.39 (3.92)	22.08 (8.55)	16.81 (7.28)	26.32 (9.58)	21.27 (5.87)	14.45 (7.71)
		22.56 (8.15)	8.52 (4.08)	21.70 (8.38)	16.51 (7.23)	26.97 (10.19)	21.86 (5.85)	15.01 (8.21)
	Total	20.98 (7.24)	8.53 (4.18)	20.16 (7.74)	14.55 (6.12)	28.60 (11.03)	23.85 (5.06)	13.55 (8.31)
Women	Low	20.62 (6.27)	7.65 (3.51)	19.44 (6.14)	13.83 (5.43)	28.21 (10.60)	23.58 (5.32)	13.43 (7.71)
		20.52 (6.95)	7.89 (3.59)	20.29 (7.11)	14.43 (5.85)	28.08 (9.50)	23.33 (5.08)	13.93 (7.84)
	High	20.72 (6.85)	8.05 (3.81)	19.97 (7.08)	14.28 (5.83)	28.31 (10.43)	23.60 (5.16)	13.63 (7.98)
		22.03 (7.63)	8.72 (4.24)	21.05 (8.17)	15.61 (6.83)	27.91 (10.78)	22.92 (5.44)	14.75 (8.52)
	Total							

(continued on next page)

Table B.1 (continued)

Gender	GGGI Level	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Deterr.
	Medium	21.80 (7.59)	7.97 (3.76)	20.48 (7.36)	15.22 (6.55)	27.58 (10.41)	22.70 (5.78)	14.15 (7.98)
	High	21.31 (7.71)	8.16 (3.78)	21.24 (7.95)	15.70 (6.74)	27.14 (9.58)	22.23 (5.60)	14.21 (7.78)
	Total	21.74 (7.64)	8.31 (3.97)	20.93 (7.86)	15.51 (6.72)	27.57 (10.32)	22.64 (5.61)	14.39 (8.13)

Table B.2

Mean values (and standard deviation) for the two gender groups according to GGS-eco levels for the seven variables of interest.

Gender	GGG-eco Level	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Deterr.
Men	Low	22.47 (7.94)	8.20 (3.95)	20.42 (7.64)	15.96 (6.94)	26.84 (11.17)	23.11 (5.46)	16.06 (8.38)
	Medium	22.74 (7.73)	9.08 (4.24)	22.60 (8.56)	16.97 (7.32)	27.51 (9.44)	20.79 (6.11)	14.52 (8.05)
	High	22.46 (8.76)	8.30 (3.99)	22.08 (8.75)	16.61 (7.38)	26.56 (9.83)	21.68 (5.73)	14.44 (8.11)
	Total	22.56 (8.15)	8.52 (4.08)	21.70 (8.38)	16.51 (7.23)	26.97 (10.19)	21.86 (5.85)	15.01 (8.21)
Women	Low	20.46 (6.91)	7.89 (3.90)	19.11 (6.77)	14.16 (5.94)	28.09 (11.59)	24.53 (4.83)	14.47 (8.45)
	Medium	21.32 (7.06)	8.50 (3.90)	21.00 (7.60)	14.85 (6.08)	29.25 (9.19)	22.35 (5.50)	13.12 (7.78)
	High	20.39 (6.56)	7.76 (3.59)	19.77 (6.70)	13.83 (5.42)	27.60 (10.36)	23.96 (4.87)	13.36 (7.65)
	Total	20.72 (6.85)	8.05 (3.81)	19.97 (7.08)	14.28 (5.83)	28.31 (10.43)	23.60 (5.16)	13.63 (7.98)
Total	Low	21.60 (7.56)	8.07 (3.93)	19.85 (7.29)	15.18 (6.57)	27.38 (11.38)	23.72 (5.24)	15.37 (8.45)
	Medium	22.10 (7.46)	8.82 (4.10)	21.88 (8.17)	16.01 (6.86)	28.30 (9.36)	21.49 (5.89)	13.89 (7.96)
	High	21.52 (7.879)	8.05 (3.82)	21.03 (7.95)	15.34 (6.69)	27.04 (10.09)	22.72 (5.46)	13.95 (7.91)
	Total	21.74 (7.64)	8.31 (3.97)	20.93 (7.86)	15.51 (6.72)	27.57 (10.32)	22.64 (5.61)	14.39 (8.13)

Table B.3

Mean values (and standard deviation) for the two gender groups according to GGS-edu levels for the seven variables of interest.

Gender	GGG-edu Level	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Deterr.
Men	Low	22.48 (8.36)	8.51 (4.20)	21.26 (8.45)	16.36 (7.28)	26.48 (10.96)	22.41 (5.77)	15.69 (8.30)
	High	22.64 (7.90)	8.54 (3.93)	22.20 (8.27)	16.69 (7.16)	27.53 (9.18)	21.23 (5.87)	14.22 (8.03)
	Total	22.56 (8.15)	8.52 (4.08)	21.70 (8.38)	16.51 (7.23)	26.97 (10.19)	21.86 (5.85)	15.01 (8.21)
Women	Low	20.57 (7.145)	8.10 (3.96)	19.63 (7.26)	14.43 (6.09)	27.69 (11.32)	23.81 (5.20)	14.07 (8.19)
	High	20.91 (6.46)	7.99 (3.62)	20.40 (6.82)	14.09 (5.48)	29.07 (9.16)	23.34 (5.09)	13.10 (7.68)
	Total	20.72 (6.85)	8.05 (3.81)	19.97 (7.08)	14.28 (5.83)	28.31 (10.43)	23.60 (5.16)	13.63 (7.98)
Total	Low	21.61 (7.88)	8.32 (4.10)	20.52 (7.96)	15.48 (6.82)	27.03 (11.14)	23.05 (5.56)	14.95 (8.29)
	High	21.88 (7.34)	8.30 (3.81)	21.41 (7.70)	15.55 (6.59)	28.21 (9.20)	22.15 (5.63)	13.73 (7.90)
	Total	21.74 (7.64)	8.31 (3.97)	20.93 (7.86)	15.51 (6.72)	27.57 (10.32)	22.64 (5.61)	14.39 (8.13)

Table B.4

Mean values (and standard deviation) for the two gender groups according to GGS-health levels for the seven variables of interest.

Gender	GGs-health Level	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Dett.
Men	Low	22.05 (8.27)	8.29 (3.96)	21.39 (8.45)	16.39 (7.14)	26.91 (10.07)	22.00 (5.87)	14.69 (7.96)
	Medium	22.74 (7.86)	9.09 (4.36)	22.20 (8.35)	17.08 (7.50)	27.21 (9.80)	21.20 (6.03)	14.19 (8.01)
	High	23.24 (8.19)	8.35 (3.93)	21.71 (8.26)	16.16 (7.07)	26.82 (10.75)	22.29 (5.56)	16.38 (8.66)
	Total	22.56 (8.15)	8.52 (4.08)	21.70 (8.38)	16.51 (7.23)	26.97 (10.19)	21.86 (5.85)	15.01 (8.21)
Women	Low	20.42 (7.03)	7.74 (3.67)	19.68 (7.05)	14.16 (5.71)	28.13 (10.29)	23.68 (5.18)	14.09 (8.15)
	Medium	20.86 (6.36)	8.56 (3.98)	20.33 (6.96)	14.72 (6.02)	28.76 (9.84)	23.24 (5.32)	12.57 (7.38)
	High	21.18 (7.00)	8.10 (3.85)	20.18 (7.23)	14.03 (5.83)	28.19 (11.28)	23.83 (4.90)	13.86 (8.17)
	Total	20.72 (6.85)	8.05 (3.81)	19.97 (7.08)	14.28 (5.83)	28.31 (10.43)	23.60 (5.16)	13.63 (7.98)
Total	Low	21.30 (7.75)	8.04 (3.84)	20.60 (7.87)	15.36 (6.60)	27.48 (10.19)	22.78 (5.62)	14.42 (8.05)
	Medium	21.91 (7.27)	8.86 (4.20)	21.38 (7.80)	16.04 (6.96)	27.89 (9.85)	22.10 (5.81)	13.47 (7.77)
	High	22.36 (7.76)	8.25 (3.90)	21.06 (7.87)	15.25 (6.64)	27.41 (11.00)	22.95 (5.34)	15.30 (8.54)
	Total	21.74 (7.64)	8.31 (3.97)	20.93 (7.86)	15.51 (6.72)	27.57 (10.32)	22.64 (5.61)	14.39 (8.13)

Table B.5

Mean values (and standard deviation) for the two gender groups according to GGS-polit levels for the seven variables of interest.

Gender	GGs-polit Level	Self-decl. Risk. Beh.	Soc. Accept.	Pers. Accept.	Self-eff.	Risk Perc.	Sup. Road Saf. Pol.	Perc. Dett.
Men	Low	22.64 (8.22)	8.53 (4.20)	21.16 (8.34)	15.74 (7.08)	26.99 (11.11)	22.61 (5.60)	15.91 (8.65)
	Medium	22.57 (7.83)	8.69 (4.10)	22.09 (8.26)	17.16 (7.30)	27.32 (9.25)	20.81 (5.96)	14.35 (8.11)
	High	22.44 (8.45)	8.33 (3.89)	21.89 (8.54)	16.70 (7.23)	26.53 (10.04)	22.20 (5.83)	14.67 (7.67)
	Total	22.56 (8.15)	8.52 (4.08)	21.70 (8.38)	16.51 (7.23)	26.97 (10.19)	21.90 (5.85)	15.01 (8.21)
Women	Low	20.58 (7.34)	8.09 (4.05)	19.52 (7.43)	13.88 (5.95)	27.62 (11.91)	24.33 (5.00)	13.78 (8.40)
	Medium	20.75 (6.52)	8.08 (3.77)	20.04 (6.85)	14.44 (5.68)	29.24 (9.31)	22.70 (5.31)	13.16 (7.83)
	High	20.86 (6.62)	7.97 (3.59)	20.42 (6.90)	14.55 (5.85)	27.98 (9.79)	23.84 (5.00)	14.03 (7.62)
	Total	20.72 (6.85)	8.05 (3.81)	19.97 (7.08)	14.28 (5.83)	28.31 (10.43)	23.60 (5.16)	13.63 (7.98)
Total	Low	21.74 (7.91)	8.33 (4.14)	20.45 (7.99)	14.93 (6.67)	27.26 (11.47)	23.36 (5.41)	14.98 (8.60)
	Medium	21.74 (7.31)	8.41 (3.96)	21.15 (7.71)	15.92 (6.74)	28.20 (9.33)	21.67 (5.75)	13.81 (8.00)
	High	21.73 (7.71)	8.16 (3.76)	21.23 (7.85)	15.73 (6.51)	27.18 (9.95)	22.94 (5.52)	14.38 (7.65)
	Total	21.74 (7.64)	8.31 (3.97)	20.93 (7.86)	15.51 (6.72)	27.57 (10.32)	22.64 (5.61)	14.39 (8.13)

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