Understanding the Gender Gap in the Acceptance of Automated Vehicles: International Mobility Study Across 17 Countries

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Abstract. The common assumption is that men are more likely to accept automated vehicles (AVs) than women. However, studies have produced mixed results regarding this gender gap. Additionally, there is limited understanding of how the gender gap in the intention to use AVs might vary between countries.

This study aims to enhance the understanding of the gender gap in willingness to use AVs and how this gap might differ across various countries. To accomplish this, survey data from 18,631 respondents across 17 countries: Brazil, China, Finland, France, Germany, Hungary, India, Indonesia, Italy, Japan, Russia, Spain, South Africa, Sweden, Turkey, the UK, and the US, was analyzed. In this research, the gender gap in willingness to use AVs is defined as the difference in willingness to use AVs between men and women. The results indicate that gender differences in willingness to use AVs are not universal; some countries show opposing trends between men and women, while in others, the gender difference is not statistically significant. This study contributes to existing literature by examining the influence of gender and country on the willingness to use AVs. The findings have the potential to significantly impact policy development and transport planning by promoting gender inclusivity in future transport solutions, ensuring that all potential users can benefit from adopting AVs.

Keywords: Automated vehicles · country · gender gap · willingness to use · and future transport

1 Introduction

1.1 Background

Future mobility presents automated vehicles (AVs) as advantageous solutions for improving road safety by preventing collisions and reducing human error, optimizing traffic flow, enhancing fuel efficiency, and generating environmental benefits. Additionally, AVs can increase accessibility for individuals who cannot drive and create opportunities to improve transport equity across different user groups by enhancing accessibility

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and mobility in underserved areas. Despite all these potential benefits, public acceptance remains critical for their successful integration into the transport systems. Public acceptance of AVs technology varies across different regions and demographic groups.

Men are often perceived as being more technologically inclined than women [1]. A study found that most enthusiasts of AVs were male, younger, and more knowledgeable about conditionally automated cars [2]. These individuals expected improvements in the productive use of travel time, comfort, and safety due to the adoption of AVs [2]. Other studies indicate that younger people of both genders tend to express more enthusiasm for AV technology; however, the gender gap persists across all age groups [3, 4].

Several research studies have reported gender differences in the acceptance of AVs, with men generally showing higher levels of acceptance than women. This difference is referred to as the "gender gap" in the acceptance of AVs, as defined in [5]. The following section presents literature that discusses this gender gap in the overall acceptance of AVs.

1.2 Previous Literature Studies

Studies conducted at the country level have shown that men generally have a higher acceptance of AVs compared to women. This trend suggests the possible impact that societal, cultural, and geographical factors can have on the adoption of AV technologies. The rapidly expanding market for AV technologies is particularly prominent in Europe, the US and China. Accordingly, this section highlights key studies conducted in various countries to provide a comparative perspective on public acceptance and behavioral intentions related to the acceptance of AVs.

Nordhoff and Lehtonen (2025) applied one of the most influential technology acceptance models, the Unified Theory of Acceptance and Use of Technology (UTAUT2), to investigate behavioral intentions toward conditionally automated vehicles. This study found that the influence of facilitating conditions, hedonic motivation, driver engagement, and the moderating effects of age and gender was not significant in most countries [6]. However, the existing literature continues to primarily focus on single-country contexts. For example, Zhu et al. (2024) also employed the UTAUT model to examine the factors influencing the intention to use fully automated taxis in China. Their findings indicated gender differences in the acceptance of autonomous vehicles (AVs). Social influence and perceived safety risks have a more significant impact on women, while men's intention to adopt AVs is notably influenced by their previous knowledge of the technology [7]. In Europe, several studies have explored public acceptance of AVs, with a particular focus on demographic factors such as age and gender. A study conducted in Hungary by Jászberényi et al. (2024) found that Hungarian respondents, particularly men and younger individuals from Generation Z or Y, are more likely to intend to try AVs technology on the roads. The study identified gender as a significant factor influencing the acceptance of AVs [8].

Similar results have been found in In Denmark [9]; in Finland [10]; and the Czech Republic [11]. Additionally, a study in Germany revealed that women rated the positive aspects of AVs lower than men and expressed greater concerns about the technology [12]. In the UK, research also indicated that men exhibited a more favorable attitude towards AVs compared to women [13]. Similarly, a study in the United States found that women felt less comfortable with AVs and were less willing to use them [14]. Interestingly,

some studies indicate that this gender gap is not observed. In Greece, it was found no significant gender differences in the acceptance of autonomous shuttles [15]. Similarly, in Portugal no clear impact of gender on the adoption of AV technologies [16].

The general trend of men showing higher acceptance of AVs is not consistently observed across studies involving participants from various countries. These studies have yielded mixed results. Israelis were more likely to accept AVs, with men showing a more favorable attitude than women [17]. However, this gender gap was not found in North America (the US and Canada). Conversely, a study revealed that Indian women were more willing to ride in AVs than Indian men, whereas in the United States, the opposite was true [18].

The authors of this study have previously conducted a comprehensive analysis of the gender gap in the acceptance of AVs at SAE Level 3. Based on a questionnaire completed by 8,412 drivers across eight European countries, Torrao et al. (2024), found a significant gender gap in acceptance levels in Germany, the Netherlands, Sweden, and the UK [5]. In contrast, no such gap was identified in Italy, Poland, Romania, or Spain. Therefore, the authors concluded that the gender gap in the acceptance of AVs cannot be considered universal [5].

1.3 Research Gaps

Recent studies have increasingly focused on the influence of gender on the acceptance of AVs. Torrao et al. (2024) also conducted an extensive review of the literature relevant studies analyzing general attitudes and intention to use AVs, as well as how gender effects were addressed through different study design approaches [5]. The authors found that progress has been made in using more balanced datasets with respect to male and female participants. However, many studies continue to report gender differences in AV acceptance without offering clear explanations for these disparities. While some studies did propose potential explanations, those would benefit from more conclusive evidence. One commonly suggested explanation for the gender gap in acceptance of AVs relates to differences in knowledge and confidence; men generally report greater familiarity with AV technologies, which contributes to higher levels of acceptance [8].

Only a few studies have explored the reasons behind observed gender differences. For instance, two studies conducted in Germany offered the following insights. One study suggested that men experience anticipation of pleasure rather than anxiety when it comes to AVs, which may explain their higher willingness to use them. In contrast, women tend to experience anxiety instead [19]. Another study pointed out that women are more influenced by the perceived risks associated with AVs, while men appear less affected by such risks [20].

Emotional responses such as fear and anxiety can be influenced by broader societal and cultural factors that shape gender roles and expectations. For instance, women may be more risk-averse and cautious when approaching new technologies, while men may be more inclined to embrace innovation and take risks [3, 19]. However, Jászberényi et al. (2024) that gendered responses to AVs often arise from longstanding gender roles and socialization processes beginning in early life. In this context, gender influences the acceptance of AVs primarily through socially constructed experiences and expectations rather than inherent biological differences [8].

While public acceptance of AVs has been widely studied, relatively few investigations have addressed the gender gap in the acceptance of AV. Moreover, the limited studies that do explore this dimension report mixed and sometimes conflicting findings, as outlined in Sect. 1.2. Most of this research has been conducted in high-income countries, often with samples drawn from a single national context. Consequently, it remains unclear whether the observed gender differences along the explanations provided can be generalized globally or meaningfully account for cross-cultural variations in how men and women express their willingness to use AVs in the future.

Furthermore, to the authors' knowledge, the only study that has conducted an in-depth investigation of the gender gap in AV acceptance at a cross-country level is that of Torrao et al. (2024). This study found that the gender gap in the acceptance of AVs was observed in half of the countries analyzed (Germany, the Netherlands, Sweden, and the UK) but not in the other half (Italy, Poland, Romania, and Spain) [5].

This challenges the prevailing belief that men are more positive about AVs. The compelling evidence prompts the authors to extend their research beyond Europe to uncover valuable insights into the geographical differences in gender attitudes toward AV acceptance.

1.4 Study Aim

This study makes a relevant contribution to understanding the gender gap in willingness to use AVs by analyzing survey data collected from 17 countries across Africa, Asia, Europe, North America, and South America. While most existing research focuses on single-country or region-specific analyses, this study adopts a truly global perspective. It focuses on SAE Level 3 AVs, which are conditionally automated vehicles capable of managing all driving tasks within defined environments.

This research aims to enhance understanding of the gender gap in the acceptance of AVs through a unique cross-country analysis, measuring the willingness to use AVs between men and women in various geographic contexts. The breadth and diversity of the dataset offer insights into gender-based differences that have not been captured in the existing literature, making this one of the most comprehensive examinations to date.

2 Methods

2.1 Procedure and Recruitment

This study explored online data, which is available from the L3Pilot project, which tested conditionally automated driving functions for SAE Level 3 (L3) vehicles on European roads. The project evaluated the effects of conditionally automated vehicles on driving behavior and assessed their impacts on safety, efficiency, the environment, socioeconomics, and user acceptance. An extensive online survey was conducted with 18,631 respondents from 17 countries to investigate individual differences in the acceptance of conditionally automated vehicles. These countries include Brazil, China, Finland, France, Germany, Hungary, India, Indonesia, Italy, Japan, Russia, Spain, South Africa, Sweden, Turkey, the UK, and the US. The selected countries were chosen for their diverse car markets and geographical locations. The survey aimed to assess differences in age, gender, knowledge of conditionally automated vehicles, and their expected benefits.

Data collection took place from April 2019 to April 2020, targeting a sample representative of the country's population in terms of age and gender, specifically focusing on individuals who drive frequently. The data sample for each country was designed to reflect the demographics of age, gender, and income for their population and among frequent drivers.

The survey data is public available at Zenodo and details have been publish [21].

2.2 Procedure and Recruitment

This study uses data from the first data collection phase of the L3Pilot Global User Acceptance Survey.

Responders were first presented with instructions about what a conditionally automated vehicle, SAE Level 3, could perform to ensure that they understood how this conditionally automated vehicle operated. The introduction to the survey included the following statement:

"*Conditionally automated cars do the steering, acceleration and braking. They will stay in the lane and maintain a safe distance to the vehicle in front. They will also overtake slower moving vehicles or change lane. These are cars still have gas and brake pedals and a steering wheel.*" [21].

The questionnaire comprised five groups of questions:

1. Background information about participants, including age, gender, income, and travel habits.
2. Participants' understanding of the capabilities of conditionally automated cars (e.g., lane-keeping and autonomous overtaking).
3. Inquiries about whether participants had heard of automated cars before completing the questionnaire.
4. Participants' overall attitudes toward and acceptance of conditionally automated vehicles.
5. Participants express their intention to use conditional automation in various operational design domains, such as urban roads and congested motorways.

Data were filtered for inconsistencies and the absence of important responses. For each questionnaire item, participants were presented with the option "I prefer not to respond." When selected, these responses were defined as missing values and excluded from the analysis.

Due to the focus on the means differences identified between men and women, the non-binary gender group (28 responders) was removed from the analysis. Due to the study's focus on mean differences between men and women, respondents who identified as non-binary ($N = 28$) were not included in the statistical analysis. However, the authors recognize that incorporating non-binary perspectives could offer valuable insights into the broader gender dynamics related to the acceptance of autonomous vehicles (AVs). This inclusion would be particularly relevant when the sample size is adequate to support reliable statistical analysis.

2.3 Data Analysis

Analyses were conducted using IBM SPSS Statistics version 29. To assess the intention to use conditionally automated vehicles (SAE Level 3), the two questionnaire items relevant to this study are:

- "I intend to use a conditionally automated car in the future".
- "I would use a conditionally automated car during my everyday trips".

Responses were measured on a five-point Likert scale, with a score between 1 (Strongly disagree) to 5 (Strongly agree). The mean ratings of these questions were calculated, with higher scores indicating a greater willingness to use AVs. Additionally, a new target variable "Willingness to use conditionally AVs" was computed to account for both intentions to use in the future and during everyday trips. This new target variable was computed as follows:

Willingness to use conditionally AVs = ("Intention to use conditionally AVs in the future" + "Intention to use a conditionally AVs in everyday trips")/2.

The gender gap in the willingness to use conditionally AVs was investigated as follows:

- Gender Means Difference of intention to use conditionally AVs in the future = Mean intention to use conditionally AVs in the future (men)-Mean intention to use conditionally AVs in the future(women).
- Gender Means Difference of intention to use conditionally AVs during everyday trips = Mean intention to use conditionally AVs during everyday trips (men)-Mean intention to use conditionally AVs during everyday trips (women).
- Gender Means Difference of willingness to use conditionally AVs = Mean intention to use conditionally AVs during everyday trips (men)-Mean intention to use conditionally AVs during everyday trips (women).

Non-parametric Mann-Whitney U tests and t-tests were conducted to assess the differences between men and women in the overall sample and within each country.

This study focuses on assessing the intention to use conditionally automated vehicles (SAE Level 3). This nomenclature is simplified by the abbreviation 'AVs,' which can represent any level of automation, including Level 3.

3 Results and Discussion

3.1 Participants

Table 1 provides an overview of the participants' ages and genders for the overall sample and for each country. After data filtering and curation, the final sample comprises 18,424 participants, with an average age of 40.73 years (SD = 13.62). Participants were recruited from each country to ensure a representative sample of the national population, along with a balanced representation of male and female participants. This balance enhances the reliability of the data analysis, which aims to investigate the gender gap in ratings concerning the intention to use AVs.

Table 1. Participants age and gender summary statistics (N = 18,424).

Country	Age (years)			Gender	
	N	M[a]	SD[b]	Male (%)	Female (%)
All countries	18424	40.73	13.62	50.10	49.90
Brazil	1050	37.50	12.42	49.50	50.50
China	997	37.22	11.88	50.60	49.40
Finland	1003	50.18	12.05	59.20	40.80
France	1148	42.72	13.84	47.60	52.40
Germany	1119	43.89	14.86	50.00	50.00
Hungary	1132	41.89	14.06	49.30	50.70
India	1044	35.45	11.83	51.60	48.40
Indonesia	1050	35.30	10.88	51.10	48.90
Italy	1161	42.73	13.24	50.30	49.70
Japan	1070	45.06	13.45	49.40	50.60
Russia	1067	37.69	11.80	46.30	53.70
South Africa	1063	35.50	12.74	47.50	52.50
Spain	1068	42.17	12.38	50.60	49.40
Sweden	1148	42.54	14.92	52.30	47.70
Turkey	1054	37.17	11.78	50.10	49.90
UK	1203	41.25	13.70	49.30	50.70
US	1046	43.58	14.44	47.80	52.20

[a] Mean; [b] Standard Deviation

3.2 Overall Willingness to Use Conditionally AVs

Overall, participants expressed a positive intention to use AVs, as indicated in Table 2. Men reported a higher intention to use AVs in the future, with a mean rating of M = 3.61 (SD = 1.13), compared to women, who had a mean rating of M = 3.50 (SD = 1.16). Additionally, male participants demonstrated a greater intention to use AVs for everyday trips compared to their female counterparts.

For this study, a new target variable was created to assess both the intention to use AVs in the future and the intention to use AVs for everyday trips. This variable, labelled "willingness to use AVs", was calculated as the average of the intention to use AVs in the future and the intention to use AVs for everyday trips. The results indicated that men exhibited a higher willingness to use AVs compared to women, with a mean rating of M = 3.64 (SD = 1.01) for men, while women had a mean rating of M = 3.54 (SD = 1.06).

The difference in ratings between genders was statistically significant ($p < 0.001$), as indicated in Tables 2 and 3. This finding highlights a gender gap in the intention to use AVs among the larger sample of 18,424 participants, which included 50.10% males and responders from 17 countries.

Table 2. Participants intention to use AVs (SAE Level 3) in the future and for everyday trips, based on overall data (N = 18,424).

Item	Males			Females			Gender Difference (Males – Females)	
	N	M[a]	SD[b]	N	M[a]	SD[b]	MD[c]	SED[d]
Intention to use AVs in the future	9232	3.61	1.13	9192	3.50	1.16	**0.11*** **	0.02
Intention to use AVs for everyday trips	9232	3.68	1.11	9192	3.58	1.14	**0.09*** **	0.02

[a] Mean; [b] Standard Deviation; [c] Mean Difference; [d] Standard Error Difference
***: p < 0.001**

Table 3. Participants willingness to use AVs (SAE Level 3) computed as (Intention to use AVs in the future + Intention to use AVs for everyday trips)/2, based on overall data (N = 18,424).

Item	Males			Females			Gender Difference (Males – Females)	
	N	M[a]	SD[b]	N	M[a]	SD[b]	MD[c]	SED[d]
Willingness to use AVs	9232	3.64	1.01	9192	3.54	1.06	0.10***	0.02

[a] Mean; [b] Standard Deviation; [c] Mean Difference; [d] Standard Error Difference
***: p < 0.001**

These findings corroborate previous literature indicating generally more positive attitudes towards the acceptance of AVs among men compared to women, as shown by previous studies [7, 8, 11, 13, 22].

3.3 Gender Gap in the Willingness to Use Conditionally AVs at Country Level

The previous section identified a significant difference in the mean ratings between men and women in their willingness to use conditionally automated vehicles, referred to as AVs for simplicity in this study. Subsequently, a comprehensive investigation was conducted to determine whether the overall gender gap in the willingness to AVs follows similar trends at the country level.

This study examines the ratings of willingness to use AVs among males and females across different countries. Table 4 presents summary statistics for gender ratings regarding the willingness to use AVs across 17 countries, organized alphabetically. While men generally exhibited higher ratings for their willingness to use AVs, it is noteworthy that in a few countries, women demonstrated greater willingness than men, and those are highlighted in bold in Table 4. This was observed in China, India, Indonesia, and Turkey. For instance, women in India reported higher willingness to use AVs compared to their male counterparts, with a mean of 4.29 (SD = 0.71) for women and a mean of 4.19

(SD = 0.78) for men. This finding is interesting because it does not follow the common trend of men exhibiting a higher willingness to use AVs, as is typically reported in the literature. Moreover, this aligns with a study by Anania et al. (2018), which found that Indian women were more willing to ride in AVs than men [18]. Across the 17 countries analyzed, it is noticed that in Russia, the willingness to use AVs was similar for both men and women, with both males and females showing a mean rating of 3.70 (Table 4), still clear expression of positive attitude towards the willingness to use AVs.

Table 4. Participants willingness to use AVs (SAE Level 3) computed as (Intention to use AVs in the future + Intention to use AVs for everyday trips)/2, based on overall data (N = 18,424).

Country	Males				Females			
	N	M[a]	SD[b]	SEM[c]	N	M[a]	SD[b]	SEM[c]
Brazil	520	4.18	0.74	0.03	530	4.16	0.77	0.03
China	504	4.03	0.63	0.03	493	**4.07**	0.66	0.03
Finland	594	2.94	1.19	0.05	409	2.64	1.03	0.05
France	547	3.27	1.12	0.05	601	3.06	1.16	0.05
Germany	560	3.54	0.89	0.04	559	3.38	0.98	0.04
Hungary	558	3.67	0.93	0.04	574	3.54	0.94	0.04
India	539	4.19	0.78	0.03	505	**4.29**	0.71	0.03
Indonesia	537	4.13	0.67	0.29	513	**4.15**	0.68	0.03
Italy	584	3.58	0.90	0.04	577	3.43	0.98	0.04
Japan	529	3.32	0.90	0.04	542	3.08	0.96	0.04
Russia	494	3.70	0.91	0.04	573	3.70	0.81	0.03
South Africa	505	3.98	0.83	0.04	558	3.85	0.90	0.04
Spain	540	3.68	0.93	0.04	528	3.47	1.02	0.04
Sweden	600	3.22	1.11	0.05	548	2.95	1.12	0.05
Turkey	528	4.12	0.84	0.04	526	**4.26**	0.80	0.04
UK	593	3.23	1.14	0.05	610	3.14	1.11	0.05
US	500	3.38	1.11	0.05	546	3.14	1.07	0.05

[a] Mean; [b] Standard Deviation; and [c] Standard Error of the Mean.

In the analysis of 17 countries, it was observed that both men and women exhibited a similar willingness to use AVs in Russia. Both genders had a mean rating of 3.70 (see Table 4), indicating an evident positive attitude toward the use of AVs.

Independent samples t-tests were conducted to investigate the identified gender gaps in willingness to use AVs at the country level. The relevance of this research is supported by the findings presented in Table 5, which reveal the gender gap in the willingness to use AVs expressed by the difference in means rating between men and women. Among the 17 countries analyzed, Indonesia exhibited the smallest gender gap in the willingness to use AVs (mean difference = −0.199, SE = 0.042), while Finland demonstrated the most

significant gender gap (mean difference = 0.298, SE = 0.073), which is statistically significant ($p < 0.001$). These findings highlight the potential reluctance of Finnish women to adopt future mobility solutions based on automated vehicles technology, a trend also observed in Sweden, the US, Japan, Spain, France, Germany, Italy, Hungary, and South Africa.

Table 5. Gender gap in the willingness to use AVs (SAE Level 3) expressed by increasing order of mean difference between males and females across 17 countries.

Country	Independent Sample Test			Effect Sizes		
	MD[a]	SED[b]	Two-Sided p	Point Estimate	Lower	Upper
Indonesia	−0.199	0.042	0.633	−0.029	−0.150	0.092
Turkey	**−0.139***	**0.051**	**0.006**	**−0.170**	**−0.290**	**−0.049**
India	**−0.102***	0.046	0.029	−0.136	−0.257	−0.014
China	−0.04	0.041	0.324	−0.062	−0.187	0.062
Russia	0.003	0.052	0.947	0.004	−0.116	0.124
Brazil	0.014	0.047	0.770	0.018	−0.103	0.139
UK	0.097	0.065	0.133	0.087	−0.026	0.200
South Africa	**0.122***	0.053	0.022	0.141	0.020	0.261
Hungary	**0.130****	0.056	0.020	0.139	0.022	0.255
Italy	**0.157****	0.055	0.005	0.167	0.051	0.282
Germany	**0.165****	0.056	0.003	0.176	0.059	0.294
France	**0.205****	0.067	0.002	0.180	0.064	0.296
Spain	**0.212*****	0.060	0.000	0.217	0.096	0.337
Japan	**0.241*****	0.057	0.000	0.258	0.138	0.379
US	**0.243*****	0.068	<.001	0.223	0.101	0.344
Sweden	**0.271*****	0.066	< .001	0.242	0.126	0.359
Finland	**0.298*****	0.073	0.000	0.264	0.137	0.390

[a] Mean Difference; [b] Standard Error Difference
*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

The results presented in Table 5 indicate that the gender gap in willingness to use AVs does not follow a consistent pattern. In most countries, a statistically significant gender gap was observed in willingness to use AVs. Notably, Finland, Sweden, the United States, Japan, and Spain exhibited significant gender gaps, with p-values of less than 0.001. Particularly in Finland, which has the highest gender gap in willingness to use AVs, previous studies [10, 23] found that men tend to have a more positive attitude toward AVs compared to their female counterparts. Similarly, in the US, the results of this study support a trend of greater willingness to use AVs among men than women [24]. In contrast, no statistically significant gender gap in willingness to use AVs was found

in Indonesia, China, Russia, Brazil, and the UK. Nevertheless, it is interesting to note that in Indonesia and China, women's willingness to use AVs rated higher compared to men's. The direction of the gender effect size will be explored next.

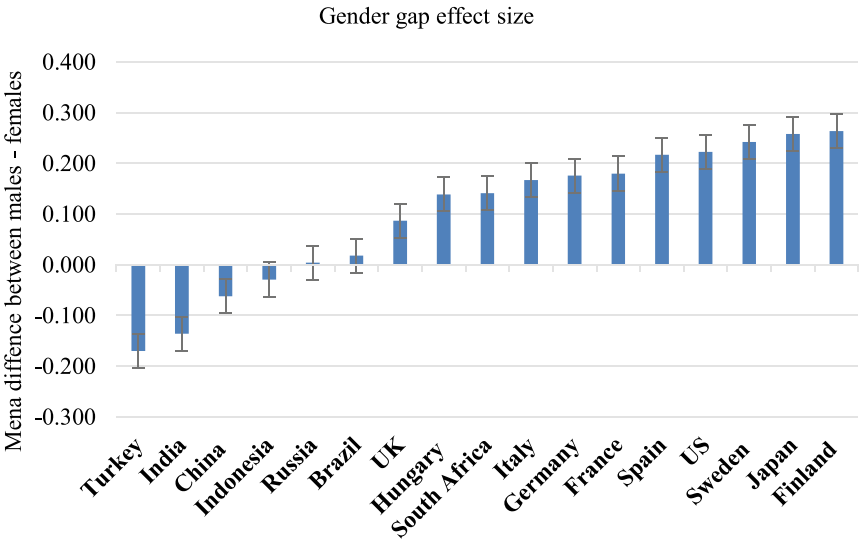

Fig. 1. Gender gap in the willingness to use AVs (SAE Level 3) and effect size across the 17 countries included in this study.

Figure 1 illustrates the effect size of the gender gap in willingness to use AVs based on Cohen's d-point estimate for the mean difference between males and females. It is evident that in most countries, the mean rating for men is higher than that for women. However, in Indonesia, Turkey, India, and China, the opposite is true, as indicated by the direction of the bars in Fig. 1. The effect size was very small for Russia, Brazil, Indonesia, and China, while it was more prominent in other countries. Although the effect size for all countries was below 0.3 (as shown by Cohen's d-point estimates in Fig. 1), the p-values indicate a statistically significant difference in willingness to use AVs between men and women in five of the 17 countries analyzed in this study. These countries: Finland, Sweden, the United States, Japan, and Spain, exhibited a significant gender gap, p-values of less than 0.001, as detailed in Table 5.

The findings gathered from this study, which covers a broader geographical representation involving 17 countries across five continents, align with a previous study by Torrao et al. (2024). That study involved participants from eight European countries and concluded that the gender gap in the acceptance of AVs did not follow a common trend; in fact, it was only observed in half of the countries [5]. As shown previously, no gender gap in the willingness to use AVs was found in Brazil, China, Indonesia, Russia, and the UK. These results corroborate the research by Nordhoff and Lehtonen (2025) gender was not significant for some countries [6]. These findings suggest that the gender gap in the acceptance of AVs cannot be considered universal and may be shaped by contextual,

cultural, or societal factors specific to each country or region. These findings demonstrate that both individual characteristics and broader country-specific contexts shape gender differences in the acceptance of AVs. It is acknowledged that the intersection of other sociodemographic factors, such as age, education level, income, employment status, annual travel distance, and prior experience with driving assistance systems, may also significantly influence AV acceptance. These factors, however, were beyond the scope of the current analysis. Similarly, country-level indicators such as GDP per capita, road infrastructure quality, and road safety performance will likely affect individuals' willingness to use AVs. Although these variables were not directly examined in this study, the authors have previously conducted an in-depth analysis of gender differences in the acceptance of AVs that incorporated country indicators of societal equality and socioeconomic development. In particular, earlier work was among the first to explore the role of the Gender Equality Index (GEI) in influencing and impacting the acceptance of AVs, revealing that both GDP and GEI were strongly correlated with the gender gap.

While integrating additional sociodemographic and macro-level data would further enrich cross-national questionnaire studies, this research aimed to identify and map variations in the gender gap in willingness to use AVs across a large and diverse international sample. These findings provide a solid foundation for future research to examine the complex interplay between gender, individual attributes, and national contexts in shaping AV adoption.

3.4 Limitations

This study focused on conditionally automated vehicles, so the results may not apply to the acceptance of automated public transport, such as autonomous shared shuttles. Additionally, the analysis focused on binary gender differences (male and female) regarding the willingness to use AVs. It did not consider the diverse gender identities, including transgender and LGBTQ+ communities. It is acknowledged that other sociodemographic factors, such as participants' income, type of occupation, and country of residence, may influence the variations in the gender gap observed at the cross-country level. Nevertheless, this study benefits from a large sample of 18,424 participants who were carefully recruited to represent the demographic characteristics of each country's population, ensuring a balanced representation of gender. This enhances the reliability of the gender analysis presented in the study.

4 Conclusion

This study aimed to examine whether a gender gap exists in the willingness to use conditionally automated passenger cars (SAE Level 3) by conducting a questionnaire study across 17 countries: Brazil, China, Finland, France, Germany, Hungary, India, Indonesia, Italy, Japan, Russia, Spain, South Africa, Sweden, Turkey, the UK, and the US.

The results revealed significant gender differences in willingness to use automated vehicles in several countries. Specifically, women were found to be significantly less willing to use AVs than men in South Africa, Hungary, Italy, Germany, France, Spain,

Japan, the US, Sweden, and Finland. This indicates a gender gap in AV acceptance within these national contexts. In contrast, the pattern was reversed in Turkey and India, where women reported a higher willingness to use AVs than men. Conversely, no significant gender differences were observed in Brazil, China, Indonesia, Russia, or the UK. These findings highlight the nuanced and context-dependent nature of gender differences in the acceptance of AVs, underlining the importance of incorporating gender perspectives in future policy and design considerations related to future automated mobility.

Based on the findings of this study, three key recommendations are proposed.

- **Incorporate gender-sensitive design and testing in AVs development.** The design and testing of automated vehicles should account for comfort, communication interfaces, safety, and emergency features that address the needs of women and other underrepresented groups. This inclusive approach will help ensure that the design of AVs, user experience, and technological development are co-created with diverse user populations, ultimately enhancing accessibility and user trust.
- **Promote Gender-Inclusive Policy Strategies.** Policymakers and transport authorities should explicitly incorporate gender considerations into AV regulation, testing, deployment, and adoption strategies. Embedding gender equity within transport policy frameworks will contribute to the development of more inclusive, equitable, and socially sustainable mobility systems.
- **Conduct country-specific interventions and public engagement campaigns**. Interventions should be developed to reflect the cultural and specific perceptions within each country. Public engagement campaigns can help overcome barriers to the acceptance of AVs by addressing safety concerns, building trust, and communicating the broader benefits of AVs for diverse user groups. These efforts will support a more equitable and sustainable transition to future transport systems.

Future research will examine the underlying causes of gender differences in the willingness to use automated vehicles. Specifically, it will focus on understanding why women in some countries are less willing to use AVs, while in others, they demonstrate a greater willingness than men. Additionally, it will explore the intersectionality of gender with other demographic and contextual factors, such as income and urban or rural areas. Country-level indicators, such as GDP per capita and road safety performance, will also be considered to understand AV adoption in different contexts better.

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