



Safe Ride? Analysis of Female Consumer Behavior in the Context of Brazilian Ride-hailing



¿Desplazamiento Seguro? Análisis del Comportamiento de Consumo Femenino en el Contexto del Ride-hailing brasileño

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Abstract

This study examines female consumption behavior in relation to ride-hailing services in Brazil, employing mixed methods to achieve a nationally representative sample. Findings emphasize the utilitarian and technological drivers of service use, which prevail over social and environmental considerations. Key factors such as physical violence, psychological violence, and self-preservation were found to be interdependent, leading to the development of an explanatory model of female consumption. While men and women share some foundational motivations for ride-hailing adoption, differences in the nature and timing of use generate distinct perceptions, shaping more flexible behavior among women. Environmental and social concerns remain secondary in decision-making; however, asymmetries related to violence and self-preservation become more pronounced during off-peak travel periods. Importantly, female consumption behavior is not static but varies according to contextual influences. These insights hold significant implications for future research and for organizations providing ride-hailing services, underscoring the necessity of adapting to the evolving needs of female users. This study establishes a benchmark in the analysis of female consumption behavior, challenging the notion of fixed determinants and highlighting the critical role of context and time of day in shaping decisions.

Keywords: On-demand mobility; Technology; Female consumer behavior.

Resumen

El estudio abordó el comportamiento de consumo femenino asociado al ride-hailing en Brasil, empleando métodos combinados para obtener una muestra nacionalmente representativa. Se destacó la naturaleza utilitaria y tecnológica del uso de este servicio, superponiéndose a las preocupaciones sociales o ambientales, junto con variables como violencia física, violencia psicológica y autoconservación. Los resultados revelaron la interdependencia de estas variables, proponiendo un modelo explicativo de la naturaleza del

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consumo femenino. Aunque existen similitudes en las bases que sustentan el uso tanto para hombres como para mujeres, las diferencias en la naturaleza y el momento del uso llevan a percepciones distintas, resultando en un comportamiento flexible en las mujeres. Las preocupaciones ambientales o sociales no son prioritarias en las decisiones de consumo, pero surgen asimetrías en relación con la violencia y autoconservación, especialmente durante los horarios de desplazamiento fuera del horario convencional. Además, se observó que el comportamiento de consumo femenino no es estático, sino que varía según los factores influyentes. Estas observaciones tienen implicaciones significativas para investigaciones futuras y para organizaciones que ofrecen servicios de ride-hailing, sugiriendo la necesidad de adaptarse a las necesidades cambiantes del público femenino. El estudio establece un punto de referencia en el campo del comportamiento de consumo femenino, desafiando la idea de que las variables que influyen en el uso son permanentes y destacando la importancia de considerar el contexto y el momento del día en la toma de decisiones.

Palabras Clave: Desplazamiento a demanda; Tecnología, Comportamiento del consumidor femenino.

Introduction

On-demand transportation services (ride-hailing) operate through digital platforms that connect drivers with passengers (Violin, 2020) and have revolutionized urban mobility (Dias, 2021).

The proliferation of these platforms has been facilitated by the popularization of the Internet and the widespread access to smartphones, leading to the emergence of this type of activity in Brazil. In Brazil, there are studies on this topic, particularly at the local level and/or addressing social, environmental, or technological dimensions (Curtis & Mont, 2020).

However, no study has yet encompassed all four spheres (Violin, 2020). This study focuses on analyzing the variables that influence women's consumption behavior in the context of shared transportation, without delving into historical, sociological, anthropological, or gender issues.

The objective is to propose an explanatory model of the factors influencing women's choices regarding shared transportation, highlighting a significant association between socioeconomic elements such as gender, education, household income, driver's license ownership, and vehicle ownership, with changes in transportation modes (Shi et al., 2021).

Most international studies on this subject concentrate on general or male consumption behavior, both in developed countries (Rayle et al., 2016; Mitra et al., 2019; Lavieri & Bhat, 2019) and in developing ones (Lagos et al., 2019; Moody et al., 2021).

The aspect of female consumption remains underexplored and lacks depth (Violin, 2020), which highlights a limitation to be addressed. The model generated by this study through Confirmatory Factor Analysis enabled the corroboration or refutation of solid research on the subject, such as Aguilera-García et al. (2022) (Spain),

Soto Villagrán (2019) (Mexico), Mitra et al., 2019 (United States), Lagos et al. (2019) (Chile), Lesteven and Samadzad (2021) (Iran), Liu et al. (2022) (China), and Martínez et al. (2018) (Peru), among others.

This contribution indicates theoretical advances by emphasizing usage structures and indicators that reveal the forms and determinants of female consumption in a large-scale study.

One of the innovative aspects of this research lies in the perception of female use regarding the drivers of ride-hailing adoption. The findings suggest that women rely on utilitarian variables (Chehri & Mouftah, 2019; Brown & Lavalle, 2020; Aguilera-García et al., 2022), supported by technology.

In addition, women's concerns about physical and psychological self-preservation, as well as potential forms of violence (sexual and/or moral), are confirmed, as partially indicated in studies such as International Finance Corporation - IFC (2018), Lagos et al. (2019), World Bank Group and UFGE (2020) and Violin (2022).

The advances achieved in this research may be useful for studies addressing the same topic, as they contribute to understanding discussions in related areas such as the regulation of this activity, its impacts on cities, comparisons with other transportation modes, and even labor relations involved in service provision.

In summary, this study conducted a comprehensive literature review, covering both national and international research on shared transportation. Based on this review, an explanatory model was formulated and subjected to exploratory and confirmatory analysis, validating its results against solid studies in the field.

These advances broaden our understanding of female consumption behavior in the context of shared transportation and establish a foundation for future research and reflection in this area.

Literature Review

Shared transportation, commonly known as ride-hailing, refers to urban trips made in private vehicles through digital technology and represents one of the most significant mobility phenomena of the 21st century.

This service has experienced rapid growth due to the widespread use of smartphones and the development of digital platforms that enable access to it (Martínez et al., 2018; Curtis & Mont, 2020; Nourani et al., 2020; Costa et al., 2021).

The ride-hailing industry has evolved from a niche market into a major technological disruption, with projected revenues of US\$ 285 billion by 2030 (Huston, 2017). In 2017, approximately 3% of urban travel kilometers worldwide were completed through ride-hailing, and this figure is expected to rise sharply to 18% by 2035, with forecasts exceeding 30% in major cities (Hazan et al., 2019).

Ride-hailing services have expanded individual travel options, and factors such as convenience, reduced fares, and digital connectivity have contributed to their

global popularity over the past decade (Brown & LaValle, 2020). Projections from the United Nations indicate that 70% of the world's population will live in urban areas by 2050, generating an increased demand for transportation (ONU News, 2019).

However, negative impacts such as congestion, greenhouse gas emissions, road deterioration, and accident risks underscore the need to discuss transport modes that are economically viable, socially responsible, and environmentally sustainable to mitigate these effects (Chehri & Mouftah, 2019; Sachan et al., 2020).

Over the past decade, shared transportation services have gained momentum, especially with technological advances and ease of access for consumers. These services have brought benefits such as greater connectivity, door-to-door offerings, and cost reductions for users (Feng et al., 2017; Mourad et al., 2019).

Nonetheless, some studies highlight negative outcomes, including increased congestion and vehicle kilometers traveled (Castiglione et al., 2018; Qian et al., 2020). **Table 1** presents the most common research lines related to current ride-hailing studies, excluding the theme of gender-based use.

Table 1. Areas of Research Focus in Ride-Hailing Studies

Author(s)	Findings
Agarwal et al. (2022)	Price impacts consumption perception.
Liu et al. (2022)	Risk perception, specific trip context, individual differences, and impacts on safety perception.
Aguilera-García et al. (2022)	From a behavioral perspective, people are more open to technological innovation and favorable to market openness.
Rangel et al. (2021)	Association of fares with various explanatory variables and main differences between Uber and taxi fares.
Violin (2021)	Use of ride-hailing services associated with cost reduction, expected benefits, and technological facilitators.
Brown and LaValle (2020)	Ride-hailing services promote cost and time reduction compared to conventional taxi services.
Violin (2020)	Determination of ride-hailing usage behavior in Brazil.
Sachan et al. (2020)	Study on the use of electric vehicles including an analysis of ride-hailing services.
Chehri and Mouftah (2019)	Impacts of modern technologies on transportation systems.
Castiglione et al. (2018)	Regional travel demand model based on activities.
Qian et al. (2020)	Transportation network companies can affect travel speed and congestion time.
Feng et al. (2017)	Study on the impact of matching mechanisms on the efficiency of on-demand transportation systems.
Mourad et al. (2019)	Review of different variants of shared mobility systems.
Tafreshian and Masoud (2020)	Development of a methodology based on bipartite graphs arising in the ride-hailing matching problem.

The themes are varied and appear across spheres such as technological impacts, efficiency-related aspects, consumption behavior, urban dynamics, and other points of convergence that highlight the growing volume of knowledge and the increasing importance of the topic.

Therefore, it is important to open a discussion on the potential disparities and similarities between the influencing variables related to the general public and women, as examined in the subsection that specifically addresses ride-hailing associated with female consumption.

The literature review shows that women tend to make more commuting trips, covering diverse responsibilities that go beyond mere work attendance and include family care, social obligations, and various duties (Soto Villagrán, 2019; Sabogal-Cardona et al., 2021), even when they own a private vehicle (Peters, 2013).

Socioeconomic conditions and social norms may generate disparities in travel behavior between men and women, with these differences being more pronounced in developing countries due to the multiplicity of responsibilities assigned to women (Sabogal-Cardona et al., 2021).

In addition to their distinct travel needs, many women are victims of moral and sexual harassment, raising concerns about safety in the use of public transportation - particularly in Latin American transit systems, which often lack effective mechanisms or protocols to prevent potential crimes, with some exceptions (Tun et al., 2020; World Bank Group & UFGE, 2020) - and may present cases of harassment and sexual assault (FIA Foundation & CAF, 2017).

In the Brazilian context, inequalities associated with race and gender can be identified in terms of the level of financial commitment to transportation expenses, generally resulting in higher costs for Black men compared to White women, regardless of the travel mode (Pereira et al., 2021).

This situation tends to occur because men have greater participation in the labor market compared to women, who also have lower rates of vehicle ownership and a higher prevalence of short trips associated with household responsibilities and the care of family members (Silveira Neto et al., 2015; Shaheen et al., 2019).

In addition, it is noted that: Women also face greater restrictions than men in their ability to travel. These include accessibility, vehicle availability, personal safety concerns, and, in some countries, social norms regarding independent mobility.

This not only limits women's income-generating opportunities but also constrains social development and mobility, restricting their access to health, education, and other services—for themselves as well as for their children or other family members under their care (IFC, 2018, p. 9).

Women are less likely to participate in paid employment, not necessarily due to a lack of education or qualifications, but rather because they tend to disproportionately assume responsibilities related to unpaid care work or face restrictions

imposed by the working conditions of certain jobs (IFC, 2018; World Bank Group & UFGE, 2020).

Thus, a second consumption driver can be identified, specifically based on the need for more agile travel with fewer time and location barriers for pick-up and drop-off, as provided by ride-hailing services.

Compared to women, men are more likely to reduce the frequency of trips in their own vehicles, which indicates a significant gender difference in shared mobility—whether due to parking costs, usage restrictions imposed by municipal authorities, or even issues related to alcohol consumption or congestion (IFC, 2018; Lavieri & Bhat, 2019; Shi et al., 2021).

A study by Martínez et al. (2018) suggests that travel time savings and increased safety may play a decisive role in improving women's access to employment, thereby aligning with the principles of ride-hailing services and their consumption drivers. Considering the multiplicity of variables, **Table 2** presents national and international studies on women's use of transportation:

Table 2. Female Usage Drivers Related to Ride-Hailing Services

Author(s)	Topic	Factor
FIA Foundation and CAF (2017)	Aggression and sexual assault.	Physical and Psychological Safety
World Bank Group and UFGE (2020)	Need to work close to home or with facilitated commuting.	Reduction of temporal and pick-up/drop-off barriers
Lavieri and Bhat (2019)	Men exhibit higher levels of travel-seeking attitudes across various modes.	Variety and travel-seeking attitude
Lagos et al. (2019)	Fatal traffic accidents due to drunk driving.	Life risk associated with fatalities and intoxication
Martínez et al. (2018)	Facilitators of female access to employment.	Travel time savings and increased safety
Shi et al. (2021)	Influence of trip frequency and structure on mode choice.	Improved service conditions as an attraction factor

The number of international studies on this subject remains limited; however, the steady growth in the number of female users of this service (World Bank Group & UFGE, 2020; Shi et al., 2021) makes it a robust segment worthy of attention in terms of consumption behavior, given the wide spectrum of structures utilized by women. Although the topic is gaining relevance and discussion at the international level, studies in Brazil remain limited and mostly narrow in scope, as shown in **Table 3**.

Table 3. Women Requesting Rides in Brazil

Author(s)	Nature	Focus	Sample	Scope	Female Focus
Miranda (2020)	Master's thesis	Use based on trust, price, quality, and socialization.	22 women	Local	Partial
Costa et al. (2021)	Conference proceedings	Price is the predominant usage factor.	312	Local	Partial
Nourani et al. (2020)	Book chapter	Safety is a distinctive element in women's use of private rides.	211 women	Local	Partial
Bezerra (2021)	Journal article	Precarious work of female drivers	462 (215 women)	Not specified	Yes
Colodetti and Melo (2020)	Journal article	Female participation as director and its social and cultural role	Not specified	Local	Yes

In view of the above, the need to determine the elements that influence consumer behavior in the Brazilian case is reinforced, considering both the expansion of service offerings within the national territory and the limited knowledge available in the academic field as well as in professional practice related to the subject.

Methodology

The set of methodological procedures was focused on ensuring that the survey and the measurement instrument were properly designed and tested to validate the proposed model according to criteria established in the literature.

Three probabilistic procedures were employed in the research design to ensure consistency in determining sampling points, target population, sample size, data collection periods, and other aspects.

The first procedure was the sampling grid, used to uniquely identify the population of interest while excluding unrelated elements. Women over the age of 18 were approached at traditional boarding locations, and their attitudes toward the use of ride-hailing services were observed.

The second procedure was systematic sampling, which sought to obtain the largest possible number of respondents with the potential for balanced participation. It was established that every third subject identified during each observation shift would be approached for an interview.

The study also employed cluster sampling, identifying the main locations where events occurred. Hotels, shopping centers, bus stations, airports, fairs, public events, and universities were selected as incidence sites. The data collection instrument was developed based on previous studies addressing the drivers of ride-hailing use, as well as research specifically directed at the female population.

The set of authors mentioned in **Table 4** represents the main drivers identified in the literature and served as the basis for developing the research instrument, which employed questions based on a five-point Likert scale.

Table 4. Research-Defining Variables

Author(s)	Factors	General Public	Female Public	Nature
Geissinger et al. (2020) ; Curtis & Mont (2020)	Pollutant reduction			Environmental
	Vehicle reduction			Social
FIA Foundation and CAF, (2017); Martínez et al. (2018); Nourani et al. (2020)	Physical safety			Social
	Psychological safety			Technological
IFC, (2018); Martínez et al. (2018); World Bank Group and UFGE (2020); Violin (2021)	Technological availability			Technological
	Boarding convenience			Technological
	Time convenience			Social
Lagos et al. (2019)	Risk reduction (drunkenness, fatalities)			Technological
Bajaj et al. (2020); Zhu and Liu (2020); Violin (2021)	Data security			Social
	Expected benefits			Economic
Miranda (2020); Violin (2020); Costa et al. (2021); Aguilera-García et al. (2022)	Service quality			Technological
	Service trust			Economic
	Reduced price			Social
	Socialization			Environmental

This approach facilitated the interpretation of data within IBM SPSS Statistics and ensured integrity in its treatment. Based on this structure, a pretest was conducted between September and October 2022 at the identified locations, with one-hour sessions at each site over the course of eight daily hours, not exceeding 24 hours per city.

A total of 174 valid interviews were obtained, standardized from a sample of 143. These data were not included in the total volume of material collected.

The definition of the sample emerged from the pretest, which determined the sample size by considering that there was an average of approximately two female boardings/disembarkings in the capitals for each similar occurrence in smaller cities.

Taking into account the incidence sites, the time spent in each locality, and the aim of national coverage, a collection volume of 100 samples was established for capitals and 50 for interior cities, along with the incidence points for boarding, disembarking, and interviews.

The data collection phase was carried out in at least two capital cities per region, including the South (Florianópolis and Curitiba), Midwest (Campo Grande and Goiânia), Southeast (São Paulo, Rio de Janeiro, and Minas Gerais), Northeast

(Salvador and Fortaleza), and North (Manaus and Belém), in addition to the Federal District. In this way, all regions of Brazil were covered.

In the interior cities, data were collected in locations such as Joinville, Blumenau, Londrina, and Maringá in the South; Dourados, Três Lagoas, Aparecida de Goiânia, and Anápolis in the Midwest; Guarulhos, Campinas, São Gonçalo, Duque de Caxias, Uberlândia, and Contagem in the Southeast; Feira de Santana, Vitória da Conquista, Caucaia, and Juazeiro do Norte in the Northeast; and Ananindeua, Santarém, Manacapuru, and Parintins in the North.

The data collection phase was conducted from November 2022 to December 2023, generating 2,300 valid interviews with users of ride-hailing services.

No significant differences were identified between capitals and interior cities in terms of usage drivers, time periods, or forms of use, indicating that the sample proved to be homogeneous.

To determine the explanatory model, Exploratory Factor Analysis was first applied to validate the variables within an appropriate set of elements, followed by Confirmatory Factor Analysis on the most influential drivers. Both analyses were conducted using IBM SPSS Statistics. **Figure 1** illustrates the methodological pathway.

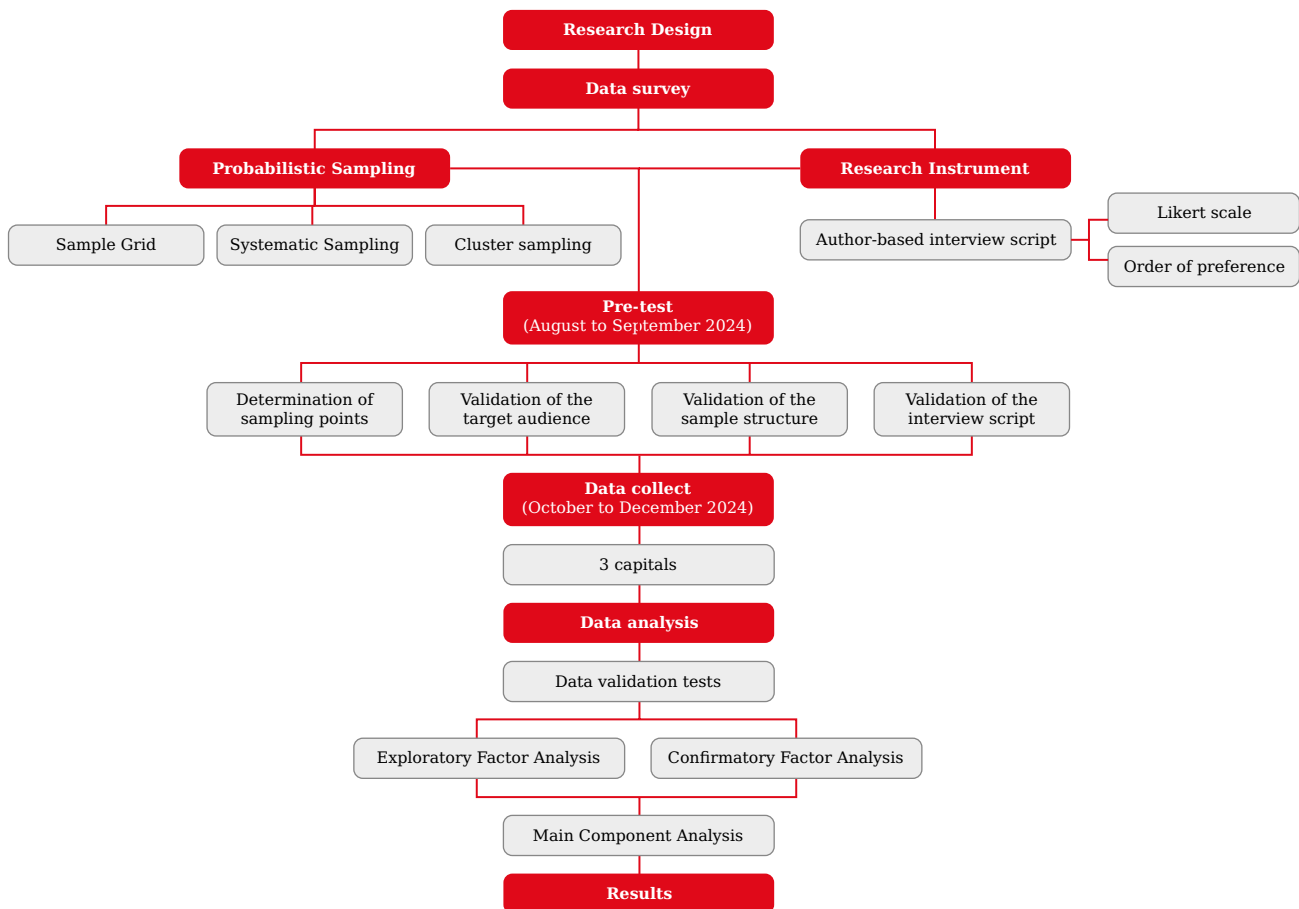


Figure 1. Research Procedures Scheme

As validation parameters, data reliability indicators were generated through Cronbach's Alpha (0.893). Both the Kaiser-Meyer-Olkin measure (≥ 0.80) and Bartlett's test of sphericity showed adequate significance (≤ 0.005), indicating consistency and reliability (Matos, 2019).

Results

As a way of legitimizing the set of analytical variables concerning the factors that influence the use of ride-hailing services from a female perspective, the data were initially measured using Exploratory Factor Analysis, through the Total Variance Explained, as shown in **Table 5**.

Table 5. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total
1	4,628	33,054	33,054	4,628	33,054	33,054	3,268
2	1,933	13,810	46,864	1,933	13,810	46,864	2,659
3	1,773	12,663	60,528	1,773	12,663	60,528	1,905
4	1,148	8,197	67,725	1,148	8,197	67,725	1,422
5	1,028	7,340	75,064	1,028	7,340	75,064	1,255
6	,735	5,251	80,316				
7	,669	4,778	85,094				
8	,516	3,689	88,783				
9	,393	2,805	91,588				
10	,320	2,284	93,873				
11	,296	2,115	95,987				
12	,217	1,549	97,536				
13	,210	1,504	99,040				
14	,134	,960	100,000				

Note: Extraction method (Principal Component Analysis).

The data indicate that the set of variables explains 75.06% of the reasons for women's use of ride-hailing services in Brazil across five factor groups, considering the $\geq .60$ prerogatives (Matos, 2019). Thus, the set of variables is accepted. Before their contextualization, the factorial distribution is presented, as highlighted in **Table 6**.

Table 6. Communalities, Component Matrix, and Factor Loadings

Indicators	Reduced Price	Expected Benefits	Boarding Convenience	Technological Availability	Psychological	Physical Safety	Risk Reduction	Socialization	Data Security	Time Convenience	Service Trust	Service Quality	Pollution Reduction	Vehicle Reduction
Communalities	,703	,769	,838	,705	,715	,892	,736	,782	,804	,936	,707	,516	,630	,776
Factor Loadings a	,899	,788	,721	,847	,866	,848	,720	,510	,710	,727	,544	,563	,513	,522
Factor b	1	1	1	1	1	1	2	2	2	3	4	4	5	5

Note: ^a Rotation method: Varimax / ^b Factor categorization to which the variable belongs.

The values expressed in the communalities field ($\geq .500$), together with the variables in the Factor Matrix that present loadings $\geq .60$, indicate the reliability of the set of elements. In addition, the percentage of variance above 60% further supports the reliability of the data (Yong & Pearce, 2013; Matos, 2019). To reinforce this point, Figure 2 is presented:

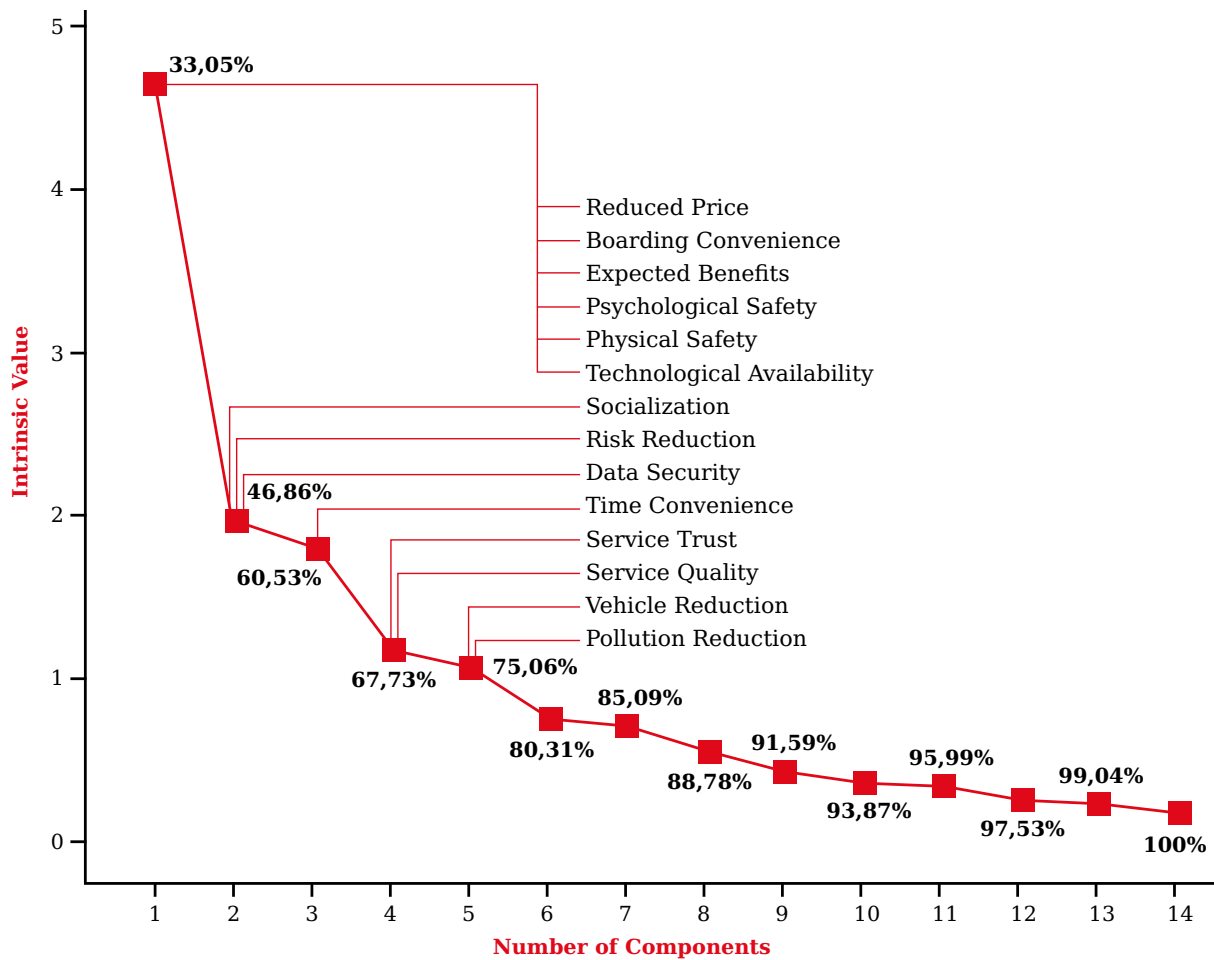


Figure 2. Scree Plot

The inflection point occurs at the fifth factor, with 75.06%. However, the acceptability condition of the dataset (60%) is already reached at the third factor. This threshold may be considered the initial indicative parameter of the variables influencing female consumer behavior. Specifically, Reduced Price, Boarding Convenience, Benefit Expectation, Physical and Psychological Safety, and Technological Availability are grouped within the first factor. Socialization, Risk Reduction, and Data Security belong to the second factor, and, together with Time Convenience, reach the level of reliability accepted in Applied Social Sciences (Field et al., 2012).

Subsequently, the data were subjected to Confirmatory Factor Analysis (CFA) for the development of the model. **Table 7** presents Model 1, composed of the fourteen measured variables. The Modified Model retained nine variables that aligned with the explanatory proposal, namely: Benefit Expectation, Time Convenience, Boarding Convenience, Technological Availability, Psychological Safety, Physical Safety, Socialization, Risk Reduction, and Reduced Price.

Table 7. Comparative Data Between Models – Confirmatory Factor Analysis

Models	Absolute Fit Indices		Incremental Fit Indices			Parsimony-Adjusted Fit Indices			
	Chi-square (χ^2)	RMSEA	CFI	TLI	NFI	PRATIO	PCFI	PNFI	AIC
Model 1	0,000	0,222	0,658	0,674	0,633	0,708	0,519	0,515	5828,795
Modified Model	0,0072	,0055	0,912	0,921	0,904	0,864	0,773	0,758	3006,143

Model 1 did not prove to be adequate, considering the elements presented. The variables identified were extracted based on the prerogatives of the parameters expressed by the Confirmatory Factor Analysis (CFA), including indicators derived from covariances, regression relationships, and incremental fit measures.

The modified model demonstrated plausibility, as indicated by $\chi^2 \geq 0.0$, suggesting that the distance between the observed data matrix and the estimated matrix was acceptable (Matos, 2019). The RMSEA yielded a value ≤ 0.060 , which is considered satisfactory, while the incremental fit indices (CFI, TLI, and NFI) reported values ≥ 0.90 (Yong & Pearce, 2013), thus confirming that the proposed model presents an adequate structural fit.

Parsimony indices, expressed by PRATIO, PCFI, and PNFI, showed values ≥ 0.50 , further supporting a parsimonious fit (Yong & Pearce, 2013). Additionally, the AIC values indicated that the modified model was both relevant and consistent (Matos, 2019). In the second stage of the confirmatory factor analysis, the set of indicators was contextualized and presented sequentially in **Table 8**.

The data presented in **Table 8** indicate $p < 0.001$ in the field of Regression Weights, confirming adequacy. The dataset shows no evidence of multicollinearity, while the regression indicators, variance values, standardized regression weights, and squared multiple correlations are consistent with the literature (Yong & Pearce, 2013; Field et al., 2012).

Table 8. Regression Weights, Variances, and Intercepts

Variables	Regression Weights				Variance				Standardized Regression Weights	Squared Multiple Correlations
	Estimate	S.E.	C.R.	P	Estimate	S.E.	C.R.	P		
Expected Benefits	,307	,008	37,630	***	,099	,004	28,103	***	,713	,188
Time Convenience	,076	,010	7,601	***	,091	,003	29,315	***	,167	,075
Boarding Convenience	,441	,016	27,180	***	,200	,006	33,779	***	,551	,712
Technological Availability	,316	,008	38,917	***	,444	,014	31,991	***	,731	,518
Psychological Safety	,744	,020	38,117	***	,087	,003	28,806	***	,720	,534
Physical Safety	,441	,009	47,883	***	,515	,018	29,128	***	,844	,304
Socialization	,127	,010	12,599	***	,079	,003	22,898	***	,273	,028
Risk Reduction	,294	,014	20,604	***	,199	,006	33,553	***	,433	,509
Reduced Price	,358	,009	40,481	***	,375	,011	32,897	***	,752	,565

Based on the data generated through AMOS (integrated with IBM SPSS Statistics), the proposed model is represented in **Figure 3**.

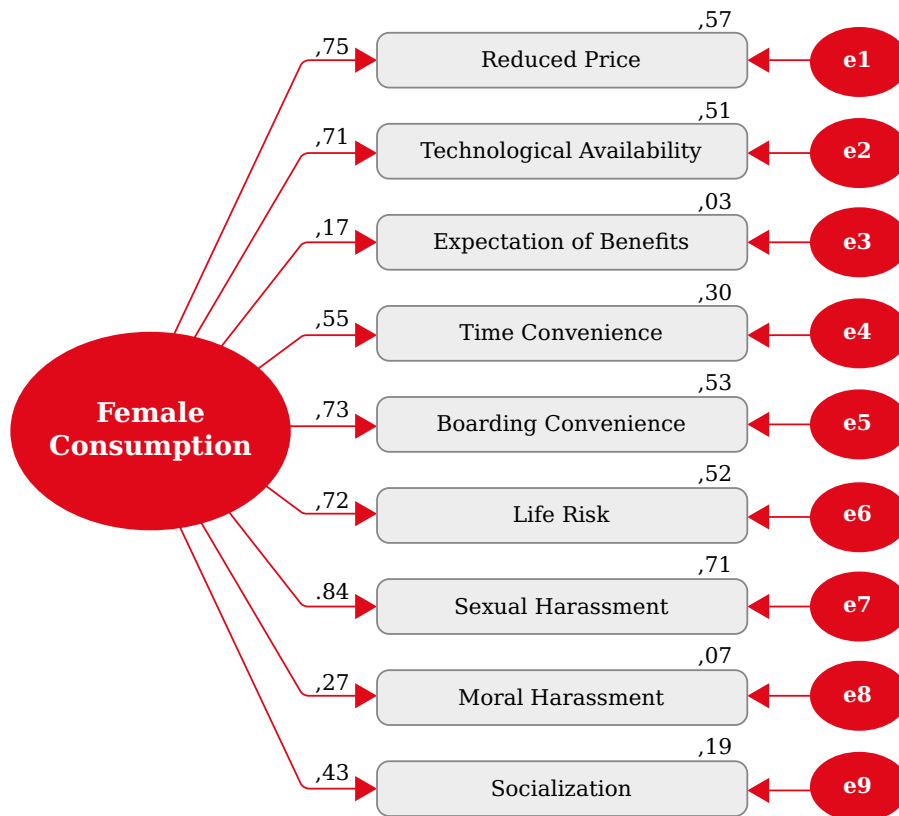


Figure 3. Path Diagram

Nine of the fourteen measured variables adhered to the Confirmatory Factor Analysis (CFA) model. Reduced Price, Benefit Expectation, Time Convenience, Boarding Convenience, Technological Availability, and Socialization are elements previously identified in studies with general audiences, regardless of gender and usage frequency, and are strongly linked to overall consumption behavior (Martínez et al., 2018; Geissinger et al., 2020; Curtis & Mont, 2020; Bajaj et al., 2020; Zhu & Liu, 2020; Violin, 2021).

The variables Psychological Safety, Physical Safety, and Risk Reduction were particularly relevant in structuring questions regarding female perceptions, as highlighted in studies such as IFC (2018), Lagos et al. (2019), Miranda (2020), Nourani et al. (2020), World Bank Group & UFGE (2020), and Shi et al. (2021).

It can be inferred that the female audience presents variables similar to those of the general population regarding usage structure, prioritizing elements such as reduced price, app availability, boarding location convenience, and schedule flexibility, among others, as indicated by findings from consistent studies including FIA Foundation and CAF (2017), Eckhardt et al. (2019), Nourani et al. (2020), Violin (2020), and Costa et al. (2021).

Rational financial and economic facilitators emerge as latent drivers of usage, with the exception of Socialization, which appeared in specific usage contexts, particularly related to nighttime leisure, and was not observed in work- or obligation-related situations, corroborating Shaheen et al. (2019) and Aguilera-García et al. (2022).

Economic and technological variables, together with Socialization, form the core of female consumption behavior in this study, whose results are consistent with research including both men and women, such as IFC (2018), Geissinger et al. (2020), World Bank Group and UFGE (2020), Curtis and Mont (2020), Zhu and Liu (2020), and Violin (2021).

The Socialization variable reflects the pursuit of personal benefit and does not indicate concern for other users of the service, suggesting that consumption behavior is linked to private interests.

Specifically, elements associated with female consumption related to physical and psychological integrity - particularly Sexual Harassment, Moral Harassment, and Life Risk - identified in the literature as relevant (Gardner et al., 2017; Gekoski et al., 2017; Martínez et al., 2018; Nourani et al., 2020) emerged prominently depending on usage moments.

For instance, during leisure or social obligation contexts, particularly at night or early morning, these variables are more highly valued, in contrast to morning work-related use. It is important to note that concern about sexual harassment mainly occurs during nighttime transportation, especially when leaving events, universities, or returning home from long or remote trips. This observation was not consistently reported in other studies.

Conversely, moral harassment is a concern at any usage time and across all consumption contexts (leisure, work, personal obligations, or other responsibilities),

primarily characterized by verbal aggression, partially corroborated by studies such as Soto Villagrán (2019), Shaheen et al. (2019), and Sabogal-Cardona et al. (2021).

The Life Risk variable is mainly associated with nighttime leisure or social obligations that often involve alcohol consumption, fear of accidents due to unfamiliar routes, or fatigue, corroborated by Lagos et al. (2019).

Thus, in the explanatory context, female consumption behavior presents usage drivers similar to those described in the literature for general audiences, combined with concern for physical and psychological integrity, particularly associated with time of day and usage motives, such as work or social obligations, various responsibilities (e.g., family care or personal/family health), or leisure activities occurring at any time. These assertions are supported by Violin (2022).

These findings indicate that usage time and period of day are strong influencers of concerns related to harassment and life risk, particularly during leisure or social obligation contexts, which are more frequent at night and early morning.

Finally, it is inferred that female consumption behavior is dynamic, changing according to usage context and time period, while remaining consistent with the results of prior research, including Lagos et al. (2019), Eckhardt et al. (2019), Bajaj et al. (2020), Zhu and Liu (2020), Geissinger et al. (2020), Curtis and Mont (2020), Nourani et al. (2020), Miranda (2020), World Bank Group & UFGE (2020), and Violin (2021).

Conclusions

The topic of ride-hailing is highly relevant, considering the global evolution of supply in recent years, with particular emphasis on the expansion of specialized services. Male and female consumption behavior in Brazil shows similarities in the foundational elements guiding usage and the values attributed to it.

However, the nature and timing of usage generate differences in women's perception of these variables, indicating that their reasons for use vary according to the situations in which they find themselves, resulting in flexible behavior.

Common variables emerge for both audiences, such as reduced price and technological convenience related to time and boarding, whereas environmental or social concerns are largely disregarded in consumption decisions.

Asymmetries appear when focusing on types of violence and the need for self-preservation, particularly associated with trips taken during off-peak hours, such as early morning.

Trip frequency does not appear to drive loyalty to a particular application, as usage decision variables are associated with individualistic considerations, such as cost, time, and boarding convenience.

This may explain the existence of women-only apps, which still represent smaller competitors compared to traditional applications.

To date, most studies in Brazil have not focused on analyzing the motivations and characteristics of the female audience in ride-hailing usage.

The study reveals that technological, individual, and social factors prevail over environmental factors, demonstrating that the latter are not a priority for consumers when deciding to hire the service.

It also shows that female behavior in using this transportation mode is uniform, without significant variations according to location.

Thus, the study contributes to theory by demonstrating the changing nature of the composition of influence elements on consumption behavior, alternating variables according to usage moments and the associated time of day.

In other words, female consumption behavior is not static and can combine the set of factors influencing their decision-making process.

These observations can serve as a basis for future studies that confirm the alterable perceptual nature of the female audience and guide organizations in adapting their offerings.

It is also relevant to associate the findings of this research with other studies analyzing the impact of the service on rates of sexual, verbal, and/or physical violence, to understand whether this type of service positively or negatively affects case volume, and whether women opt for women-only apps due to these factors.

This study stands out for establishing a reference point, particularly in the field of female consumption behavior, showing its changing nature and challenging the notion that the variables influencing usage are permanent, while the decision-making process is affected by the reasons for use and the time of day.

Conflict of Interest

The authors declare that they have no conflict of interest.

Financial Resources

All expenses related to this research were borne by the authors.

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