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Consumption inductors of displacement modes linked to ride-hailing in Brazil

Indutores de consumo de modais de deslocamento vinculadas ao ride-hailing no Brasil

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Abstract

The study proposed to survey the consumption inducers related to displacement on demand in Brazil and had 3425 interviews whose data were submitted to exploratory and confirmatory factor analysis using the IBM SPSS Statistics software. In order to have robustness in the results measured, the analysis variables relating to the country's reality were designed through a review of the state of the art and the design of the supply incidence points. Six variables underlying the consumption decision-making process, based on the technological aspect of supply and marked by the utilitarian sense of use, emerged from the research. As theoretical-practical implications, the results corroborate international research linking consumption to the aspect of personal interest to the detriment of the common good and socio-environmental concerns pointed out by the first studies related to the theme. In this way, advances in the field of knowledge are indicated by highlighting the impacts of convenience, technology and individualism in consumption. The study is innovative because it outlines the indicators of consumption direction, indicating trends to be observed by public managers and private organizations, in contrast to studies on the same theme whose observation base is restricted to one location or even region.

Keywords: Sharing Economy. Transportation Network Companies. Use Motivators.

Resumo

O estudo se propôs a levantar os indutores de consumo relacionados ao deslocamento sob demanda no Brasil e contou com 3425 entrevistas cujos dados submetidos à análise fatorial exploratória e confirmatória através do software IBM SPSS Statistics. Para se ter robustez nos resultados aferidos, desenhou-se através da revisão do estado da arte e do delineamento dos pontos de incidência da oferta as variáveis de análise atinentes a

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realidade do país. Emergiu da pesquisa o apontamento de seis variáveis subjacentes ao processo de tomada de decisão de consumo pautadas no aspecto tecnológico da oferta e marcadas pelo senso utilitarista de uso. Como implicações teórico-práticas, os resultados corroboram com pesquisas internacionais ligando o consumo ao aspecto de interesse pessoal em detrimento do bem comum e das preocupações socioambientais apontados pelos primeiros estudos relacionados a temática. Indica-se, desse modo, avanços no campo do conhecimento ao evidenciar-se os impactos da conveniência, tecnologia e individualismo no consumo. O estudo é inovador, pois traça - através da análise confirmatória - os indicativos de direcionamento de consumo, indicando tendências a serem observadas por gestores públicos e organizações privadas, contrapondo-se aos estudos da mesma temática cuja base de observação restringe-se a uma localidade ou mesmo região.

***Palavras-chave**: Economia Compartilhada. Empresas de redes de transporte. Motivadores de uso.*

Introduction

Studies related to the motivators for the use of Ride-hiling have swelled mainly from 2017 onwards, without, however, unveiling in many locations - as is the case in Brazil - the inducing variables underlying the decision-making process of users (Alemi et al., 2019; Filippas et al., 2020).

Ride-hailing services characterized as Transport Network Companies (TNC), despite having been in existence for a little over a decade, had a significant increase in their use (Shoman & Moreno, 2021) and became a travel option in several cities around the world.

Its expansion is not surprising (Lee et al., 2021), as the service offers a wide range of consumption process facilitators, including lower cost (compared to traditional taxis) and time convenience (compared to public transport) via the use of digital platforms that bring facilitators such as real-time location, driver/user data, cost and time estimates or even boarding convenience (Alemi et al., 2019; Filippas et al., 2020).

National surveys related to the topic expanded from 2017, focusing on the cities of São Paulo (SP); Rio de Janeiro (RJ) and Porto Alegre (RS) being mostly directed to the legal aspect, labor relations, municipal management or aimed at motivators of use. Such studies are either small, or come from digital media, often presenting a diffuse sample, which represents a gap in the field of study by not allowing a glimpse of the elements influencing the use process.

As an example of national surveys, Silva et al. (2018) (use associated with safety and cost) stand out; Souza et al. (2021) (accessibility to formal jobs) and Barreto et al. (2021) (mortality in traffic).

Studies with a nationally representative sample were not identified, unlike international studies that indicated factors underlying the use (critical consumption; connection with the community, sustainable consumption, reduced cost and lack of ownership) divided into social dimensions (e.g., universal accessibility); environmental (e.g., reduction of pollutants, kilometers driven and congestion); and economic (e.g., amount charged, cost of parking), having as reference surveys Yuana et al. (2019) and Ozanne & Ozanne (2020).

In this way, the article contributes to strengthening the understanding from the consumer's point of view of the drivers of the use of Ride-hailing by mapping the five main regions of Brazil, including 15 capitals, 20 cities (with a population of more than 100,000 inhabitants) and the Federal District. Therefore, considering the geographic representativeness of the sample, treated from the IBM SPSS Statistics software, generating the projection of the usage variables through Confirmatory Factor Analysis.

The research identified six motivators as central to the use decision-making process, allocated in the economic, socioeconomic and technological dimensions, which ultimately represents a substantial advance in the field of understanding the triggers associated with the consumption process (Standing et al., 2019; Tirachini, 2019) of this type of service in the country, particularly considering that national and international studies diverge in terms of influence dimensions (social, environmental, economic and technological) in addition to not having a consensus regarding the influence variables, points resolved by this research.

Theoretical Basis

In essence, the Sharing Economy through its primary prerogatives allows consumers and organizations to collectively innovate or insert new ideas or concepts in certain locations, create value or generate possibilities for solutions to problems or even create opportunities for sustainable practices, which can potentially improve economic aspects, social and / or environmental in a wide range of sectors (Geissinger et al., 2020; Mao et al., 2020), such as transport.

The conceptual basis of the Sharing Economy focuses on the ability to aggregate financial resources, time, people with the function of filling gaps related to the scarcity of goods or services, making use of the person-to-person connections and reduced cost, made possible by technology (Dellaert, 2019; Eckhardt et al., 2019).

The point in question is linked to access to available resources and the ability to optimize use, or reuse, in order to avoid waste or the use of new resources, mitigating or eliminating costs of an economic, social or environmental nature (Pomering, 2017).

It is possible to observe the insertion of the social, economic, environmental and technological dimensions in the embryonic process of the emergence of Sharing Economy as a field of study, based on a set of prerogatives, such as the consumer's concern with sustainability and the desire for new social connections, reduced production and consumerism, in addition to the virtualization of relationships among other aspects, allowed the concept to strengthen itself as an innovative business model (Dias et al., 2019; Mont et al., 2020).

In recent years, the rise of gig-companies (characterized by temporary and flexible jobs with independent workforce or working as freelancers) can be seen in Brazil (Microsoft Store, 2021), and in turn, travel services on demand have grown exponentially in the last decade and have become one of the main components of the modern travel service industry (Mao et al., 2020), being named as ride-hailing, ride-sourcing or ride-matching.

It is noteworthy that the phenomenon of vehicle sharing is characterized in this study from the logic that owners use their vehicle for their personal needs, but also provide the displacement service from this personal asset based on demand, extrapolating the sphere for individual use (Eckhardt et al., 2019; Filippas et al., 2020), defining the nature of this mode of displacement.

It is necessary to distinguish between the formats of access to products or services indiscriminately associated with the Shared Economy.

Thus, Collaborative Economy is conceptualized as the activity that represents an economic system based on a network that uses decentralized markets to supply underutilized assets, ordering needs with the availability of people, excluding the usual intermediaries of the process (Benjaafar & Hu, 2020).

Sharing Economy can be conceptualized as the economic system centered on the exchange of underutilized goods / services, including or not materialized pecuniary person-to-person contact (Eckhardt et al., 2019; Geissinger et al., 2020).

In turn, Collaborative Consumption emerges from the reinvention of rent, loan, exchange, sharing and/or donation, with technology as an underlying element to the process (Ertz & Leblanc-Proulx, 2018; Curtis & Mont, 2020).

Finally, ride-hailing services are featured, which are equipped with platforms that connect customers to mobility providers in real time, usually involving: low costs, rental instead of ownership, and technological facilitator support (Alemi et al., 2019; Hazan et al., 2019).

Ride-hailing represents a form of travel defined by the common agreement between a user traveling in a private vehicle driven by its owner, usually involving a fee, with access via a digital platform through a mobile device (Amirkiaee & Evangelopoulos 2018), and not it is an exaggeration to indicate that this type of offer has consistently changed the nature of personal transport in the places where it is offered (Lee et al., 2021).

It is indicated that this category of offer is able to promote sharing based on the interaction between people, supported by technological facilitators capable of reconciling the interests of underused travel service providers and takers, without transferring ownership, but involving financial compensation for the service provided (Min et al., 2018; Mao et al., 2020).

Ride-hailing services have grown in part, considering their offer of convenient door-to-door transportation and time efficiency similar to that of a private vehicle (Dias et al., 2019), technological facilitators (platform, GPS service, estimated cost of displacement, driver / user data) underlie its popularization, by generating convenience of time and place of embarkation / disembarkation, reduced cost among other benefits, points corroborated by Young et al. (2020).

There may be several factors that influence the decision to use ride-hailing services, including socio-economic characteristics of users, aspects such as time of use and purpose of commuting (Lavieri & Bhat, 2019), or even search for variety, adoption of technology and adherence to pro-environmental policies (Alemi et al., 2019).

Uses for leisure or social purposes (Wang & Yang, 2019), or even during periods of the day with a lower offer of public transport services (Tirachini, 2019), can affect service request levels.

Lifestyles highly dependent on motor vehicles, risk perceptions, ease of use, control and trust in relation to the service (Acheampong et al., 2020), can exert influence individually or in combination with users. Möhlmann (2015) indicated that aspects of influence related to belonging to the community, cost savings, familiarity, quality of service, trust and usefulness, in turn Hamari et al. (2015) highlighted the variables economic benefit, pleasure and attitude as relevant.

Amirkiaee & Evangelopoulos (2018) present advantageous aspects of the service from the users' point of view, mainly related to economic and time benefits, in addition to transport anxiety, reciprocity, confidence and attitude towards receiving a ride, whereas Malik & Rao (2019) found in his research variables related to perceived utility and ease of use, confirmation, self-efficacy, in addition to the value perceived by the consumer in relation to the service received.

Lavieri & Bhat (2019) indicated sensitivity to privacy, technology, propensity to lifestyle in search of variety and adherence to ecological style, whereas Min et al. (2018) listed elements such as perceived utility, perceived ease of use, relative advantage, compatibility, complexity, social influence and attitude.

Lee et al. (2021) highlighted the price, relational value between passenger and user, social value and perceived quality, previous experience with technology and perception of safety as preponderant in the

use of services and Nguyen-Phuoc et al. (2020) highlighted the perception of sales promotion, quality of service and benefits of the booking application as indicative of use.

Added to this set of implications are possible reductions in environmental impacts considering the underused of goods/services, increasing cohesion through the connection between individuals through technological facilitators, stimulating entrepreneurship and the ability to mitigate problems such as economic recessions, austerity government, growing disparities between social classes and problems caused by hyper-consumerism, through actions aimed at sustainability (Mont et al., 2020).

However, criticism of the model has grown based on studies that point to the existence of little evidence on the benefits related to elements indicative of sustainability, being also perceived as a threat to employment, public safety, privacy and health, in addition to potential problems related to environmental burden (Mont et al., 2020).

Another point that has attracted attention is the discussions about precarious working conditions, an environment of predatory competitiveness based on assessments, little or no health benefits, besides instability for the driver, which could harm the way the professional behaves, without excluding related labor and legal issues, as well as discussion points related to fees and taxes (Slee, 2016).

National studies indicate a greater volume of local research, concentrated mainly in the cities of Rio de Janeiro (RJ); São Paulo (SP) and Porto Alegre (RS), with mostly small sample sizes. The main reasons for use measured are as follows in table 1.

Table 1 – Synthesis of Ride-Hailing motivators and influence dimensions in national studies

Use Motivators	Dimensions			
	Environmental	Social	Economic	Technological
Safety		■		
Cost			■	
Security Conditions		■		■
Pleasant Participation		■		
Convenience				■
Accessibility			■	■
Agility				■
Sustainability	■			
Saving time		■		■
Avoid Driving Drunk		■		
Avoid Public Transport		■		
Comfort		■		

Source: based on Coelho et al.,2017; Santos, et al., 2019; Vaclavik et al., 2020; Capaverde et al., 2020; Silva et al., 2018; Barreto,et al., 2021.

Despite the limited volume of national publications, it is indicated that the variables are concentrated on elements such as cost, safety, technological facilitators and convenience, with a greater volume of variables appearing in the social and technological dimensions.

In addition, the analysis of international studies, as indicated in table 2, points to the following panorama of usage motivators.

Table 2 – Synthesis of Ride-Hailing motivators and influence dimensions in international studies

Use Motivators	Dimensions			
	Environmental	Social	Economic	Technological
Social connections		■		
Comfort		■		■
Sustainable consumption	■	■		
Fare cost			■	■
Parking cost			■	
Ease of payment				■
No need to drive		■		
Avoid public transport		■	■	■
Data protection				■
Privacy issues				■
Pollutant reduction	■	■		
Safety		■		■
Virtualization of relationships		■		■

Source: based on Becher & Rajwani, 2016; Yuana et al., 2019; Tirachini, 2019; Standing et al., 2019; Ozanne & Ozanne, 2020.

Both national and international studies point to points in common, such as cost, data security and convenience of use, with variables allocated in the dimensions of both social, economic, environmental and technological nature.

Foreign surveys point to balance in terms of the volume of variables in the four dimensions mentioned above, in contrast to national studies that indicate economic and technological traction in decision-making on use.

Such problems distance the current form of offering the embryonic prerogative from the emergence of the Sharing Economy, based on the relationship between people and the set of social, environmental and economic benefits proclaimed in their essence.

Despite the potential of the service, there are indications that in certain places and times the offer may contribute to the increase in congestion and the kilometers traveled per vehicle (Tirachini, 2019). Another study indicates the possibility of increasing the costs of public transportation, for example, in places where the incidence of ride-hailing drastically reduces the use of buses (NTU, 2019) which could lead to higher prices for the final consumer.

Becher & Rajwani (2016) indicate that the main organizations present themselves as online platforms that connect workers to consumers, without, however, understanding drivers as company employees transferring costs, risks from the workplace and responsibilities for drivers, which makes their work environment unstable and precarious under various dimensions (Slee, 2016), which in part, would explain the reduced costs for users.

In view of previous considerations, it is imperative to highlight the variables underlying the use of Ride-hailing services in Brazil from the user's point of view, and their categorization in the economic, social and/or environmental dimensions to broaden the understanding of the context influence of this service model in Brazil.

Methodological Procedures

The research presented two phases in its design aimed at data collection. The first of them was the structuring of the measurement instrument, and the second was the determination of the places of incidence of services and determination of beacons for conducting the interviews.

The data collection instrument was initially based on the set of motivators presented by studies with scalar representativeness in order to outline the research instrument to be submitted to a pre-test. Table 3 brings the dimensions and variables most referenced in the literature, in addition to some authors illustrating such elements.

Table 3 – Dimensions, variables and guiding authors of the research instrument

Dimensions	Variables	Authors
Economic	Reduced fare value; productivity and efficiency, financial savings.	Coelho, 2017; Filippas et al., 2020; Benjaafar & Hu, 2020
Technological	Digital and interpersonal reliability; access to electronic devices and means of connection.	Zhu & Liu, 2020; Geissinger et al.,2020; Vaclavik et al., 2020; Barreto, et al., 2021
Environment	Less air pollution; reduced carbon emissions, less environmental degradation; fuel consumption.	Ertz & Leblanc-Proulx, 2018; Santos et al., 2019; Curtis & Mont, 2020, Capaverde, et al., 2020
Social	Social trust; generation of social relationships, perception of sharing, desire to share.	Zhu & Liu, 2020; Curtis & Mont, 2020, Barreto, 2021

Source: Adapted form authors cited in the table

This effort generated the data collection instrument for validation through a pre-test, and enabled the beginning of the second phase initiated by determining the service incidence points, volume of collections, and other operational aspects of the design of how to obtain data.

For the application of the pre-test, the prerogatives of probabilistic cluster sampling were used, which guides for the determination of the places of use of the services according to Zhang et al. (2018), and in this sense, São Paulo (SP), Presidente Prudente (SP), Campo Grande (MS), Dourados (MS), Curitiba

(PR) and Maringá (PR) were selected considering size, population, level of provision of service and access capability.

The determination of sampling locations was established based on on-site observation and indication of local residents as to the points of incidence of the offer and commonality of occurrence, namely: hotels, shopping centers, bus stations, airports, public fairs, events, and universities.

Applying the concepts of systematic probabilistic sampling, which signals the need to reach the largest possible volume of suitable sample subjects (Nezer et al., 2016), it was determined that considering the flow of users and access to the places of incidence, that the third sample subject would be approached, that is, for every two shipments / landings, the next subject identified as user would be invited to participate in the interview.

For the validation of the sample subject, the concepts of probabilistic sampling by sample class were used, which advocates the clear identification of the population of interest and exclusion of elements foreign to it (McBratney et al., 1981).

Therefore, two types of users were observed in the service locations, the first of which was the person with the posture of using the service (cell phone in hand, standing in boarding places, with insistent observation of the cars that approached the place and constant check of the mobile device) and the second subject were those who disembarked in these places, considering the vehicle identification stickers or, when available, the indicative signs of the service.

The interview structure included a set of questions from the literature and adapted to the five-point Likert scale with 1 indicating "irrelevant" and 5 "indispensable".

The pre-test was applied, between December 2018 and January 2019, for one hour at each identified incidence point for validation of the research instrument, for up to twelve hours in each previously designated municipality, generating two hundred and forty-six valid samples.

After the application of the pre-test, the collection of 150 interviews in the capitals and 50 in the smaller cities was determined, considering that the approximate average use was 3 shipments to 1 respectively, this calculation took into account the measurement locations, the length of stay in each location and its flow of use.

It was found that the interview questions were not fully adherent considering the lack of identification between the users' reality and the questions asked, this indicator was corroborated when the data were entered into the IBM SPSS Statistics software and did not reach the minimum indicatives in the Cronbach's test Alpha and also in Bartlett's sphericity test.

Thus, it was necessary to partially discard the data and reformulate the dimensions and issues flagged as relevant in the first pre-test, which generated the table 4, which was assembled from the dimensions flagged in the literature and already exposed in the theoretical basis of this study, plus questions in each dimension generated by the experience from the first data collection.

Table 4 – Dimensions and motivators

Dimensions	Motivators
Cost	Reduced rate; Elimination of expenses.
Technological Convenience	Technological Availability; Data security.
Convenience of use	Time convenience; Travel security; Boarding convenience.
Usage experience	Socialization; Expectation of benefits; Absence of requirements
Environmental benefits	Vehicle reduction; Pollutant reduction
Social benefits	Valuing the professional; Generation of individual income

Source: author.

The second pre-test was applied between January and February 2019. After validating the variables, data collection took place in its first stage between May 2019 and January 2020, generating 2,150 samples from over 18 years of age who used the service more than 5 times in a period of up to three months - in nine states (Belo Horizonte, Campo Grande, Curitiba, Florianópolis, Manaus, Natal, Rio de Janeiro, Salvador, São Paulo) in addition to the Federal District and in fourteen cities with more of 100 thousand inhabitants (Balneário Camboriú (SC), Bauru (SP), Campinas (SP), Campo Largo (PR), Cascavel (PR), Dourados (MS), Feira de Santana (BA), Foz do Iguaçu (PR) , Maringá (PR), Mossoró (RN), Niterói (RJ), Presidente Prudente (SP), São José (SC) and Uberlândia (MG)).

A second stage of data collection was undertaken between May 2020 and January 2021, however, considering the restrictions imposed by the Covid-19 pandemic, the volume of interviews in each location was reduced (50 in the capitals and 25 in the other cities) , the following capitals were added to the study: Belém (PA), Cuiabá (MT), Goiânia (GO), Natal (RN), Porto Alegre (RS) and Vitória (ES) and the following cities with more than 100 thousand inhabitants assisted by the service: Ananindeua (PA), Anápolis (GO), São Gonçalo do Amarante (RN), Pelotas (RS), Serra (ES) and Várzea Grande (MT), 1,275 new interviews were obtained, totaling 3,425 valid samples.

The data analysis relied on the use of the IBM SPSS Statistic software to structure the Exploratory Factor Analysis and sequentially the Confirmatory Factor Analysis, considering that the first sought to reduce the volume of variables to the acceptable set of factors that influence the consumption process, whereas the second allowed to propose a reliable model related to the variables directly linked to the study theme.

As a first indication, the results of Cronbach's Alpha test are presented in table 5.

Table 5 - Model Summary

Dimension	Cronbach's alpha	Cronbach's alpha based on standardized items	
		Total (own value)	% Variation
1	0.886	5.642	40.301
2	0.686	2.753	19.665
Total	0.949[a]	8.395	59.966

[a] Total Cronbach's alpha is based on the total eigenvalue.

Source: author

The measured values indicate adequate levels of confidence considering > 0.90, pointing out that the variables - belonging to the data matrix - are correlated. Sequentially the KMO and Bartlett test are presented in table 6.

Table 6 – Kmo and Bartlett test

Kaiser-Meyer-Olkin measure of sampling adequacy		0.891
Bartlett's sphericity test	Chi-square aprox.	34580,517
	df	91
	Sig.	0.000

Source: author

Bartlett's sphericity test shows robust indicators (with KMO ≥ .80 and p-value (sig) <.005) confirming the existence of adequate levels of correlation (Hair et al., 1987) between the variables tested.

Results and Analysis

As a way of ordering the inferences to be contextualized, it is first necessary to establish the indicative parameters arising from the Exploratory Factor Analysis and sequentially those of the Confirmatory Factor Analysis.

As a first parameter of analysis, it is indicated that the variables presented in the common areas show indexes ≥ .600, as can be observed: Reduced tariff (0.746); Technological Availability (0.721); Expected benefits (0.801); Time convenience (0.754); Boarding convenience (0.889); Data security (0.779); Travel security (0.700); Elimination of expenses (0.692); Socialization (0.819); Absence of requirements (0.837); Pollutant Reduction (0.788); Reduction of circulating vehicles (0.780); Appreciation of the professional (0.807) and Generation of individual income (0.866), which indicates the adequacy of the tested variables. Sequentially, the explained variation is presented in table 7.

Table 7 – Total Variation Explained

Components	Initial eigenvalues			Extraction of sums from square loads			Rotating sums of square loads
	Total	% variation	% cumulative	Total	% variation	% cumulative	Total
1	5.642	40.301	40.301	5.642	40.301	40.301	4.371
2	2.753	19.665	59.966	2.753	19.665	59.966	3.404
3	1.419	10.139	70.105	1.419	10.139	70.105	1.711
4	1.164	8.315	78.420	1.164	8.315	78.420	1.494
5	0.645	4.607	83.026				
6	0.430	3.074	86.100				
7	0.378	2.699	88.799				
8	0.342	2.440	91.239				
9	0.314	2.244	93.484				
10	0.294	2.103	95.587				
11	0.213	1.521	97.108				
12	0.185	1.319	98.427				
13	0.116	0.830	99.257				
14	0.104	0.743	100.000				

Source: author

The table 7 indicates the total percentage of the variance explained by the factors obtained, considering the values measured by the first factor (40.301%), second factor (19.665%), third (10.139%) and fourth factors (8.315%), respectively, if the level of 78.42% observed in the rotating sum of loads squared, being considered adequate, considering parameter index ≥ 60%, which can be observed in Figure 1.

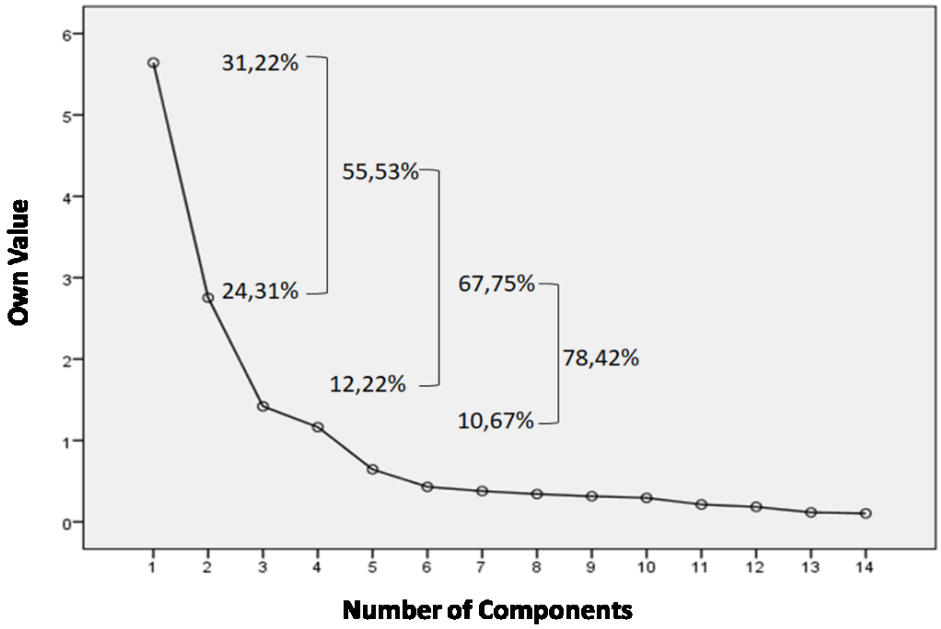

Figure 1 – Scree Plot. Source: author.

It is noteworthy the robustness of the indicators expressed in the first two factors of the figure, which together accounted for more than 55% of the structuring volume. Sequentially, the allocation of variables is presented in the context of the listed factors, by exploratory factor analysis presented in table 8.

Table 8 - Factors and variables

	Factors			
	1	2	3	4
Reduced Rate	0.875	--	--	--
Technological Availability	0.844	--	--	--
Expectation of Benefits	0.860	--	--	--
Time Convenience	--	0.774	--	--
Boarding Convenience	--	0.699	--	--
Data Security	--	0.701	--	--
Travel Safety	--	0.694	--	--
Elimination of Expenses	--	--	--	0.643
Socialization	--	--	--	0.615
Absence of Requirements	--	--	--	0.746
Pollutant Reduction	--	--	0.854	--
Reduction of Circulating Vehicles	--	--	0.863	--
Valuing the Professional	--	--	--	0.738
Generation of Individual Income	--	--	--	0.776

Extraction method: Principal component analysis.
Rotation method: Varimax with Kaiser normalization.
Converged rotation in 7 iterations.

Source: author

The structuring of the factors generated by the Exploratory Factor Analysis points to a clear division between the social elements (Socialization; Absence of requirements; Valorization of the professional and Generation of individual income) and environmental elements (Reduction of Pollutants and Reduction of

circulating vehicles), in addition to the aspects technological features of the offer (Convenience of time; Convenience of boarding; Data security and Travel security), transcribed here in increasing order of importance, according to the data in tables 7 and 8 in addition to figure 1.

The economic element, represented by the Reduced Rate and Expenditure Elimination variables, show categorical disparity, since the first is found in factor 1, the one with the highest percentage impact, and the second is allocated among the elements of factor 4, with the lowest impact , which leads to the indication that the decision-making process cannot be distinguished from a category (e.g. economic) but through the variables that make up the list of elements considered relevant to the consumer.

Such an indication is not common to be found in the literature because the studies as a whole indicate, for example, the economic or environmental dimension as important, however, not all the variables that compose them are presented as relevant from the point of view of behavior of the consumer.

The set of factors indicated as most relevant by users accommodates a variable of an economic nature (Reduced Rate); another based on the socioeconomic aspect (Expectation of Benefits) and a third linked to technological permissiveness (Technological Availability), forming the fundamental structure of the decision-making process for the use of on-demand travel modes in Brazil.

In view of the above, it is indicated that studies such as those of Pomering (2017), Ertz & Leblanc-Proulx (2018) and Curtis & Mont (2020), for example, point to the existence of elements of an environmental nature in the context of using Ride-hailing, whereas Alemi et al. (2019), Amirkiaee & Evangelopoulos (2018) indicate the existence of social variables, and still Eckhardt et al. (2019), Filippas et al. (2020) signaled the existence of elements of an economic order as influencers of the consumption decision-making process.

Nevertheless, studies such as those by Alemi et al. (2019), Dellaert (2019), Dias et al. (2019), Acheampong et al. (2020), indicate the permissive technological factors as fundamental for the expansion of supply and demand adhesion.

It follows from this set of inferences, the signaling that the elements of the first and second factors appear as robust drivers of consumption behavior, considering their modal allocation (which varies from 1 to 5, the latter being the most robust), expressed for the first factor with mode 5, the second factor with mode 4, and the other variables allocated to factors 3 and 4 were in modal categories 2 and 1 respectively.

However, such inferences alone are not enough to establish the parameters that guide consumption in the Brazilian case, in this sense, the indicators related to Confirmatory Factor Analysis are presented.

As a means of clarification, it is indicated that Model 1 is formed by the fourteen variables initially measured and the Modified Model represents the variables presented as indicative of the reasons for the use of Ride-hailing, as can be seen in figure 9:

Table 9 – Different indicators between models

Models	Absolute adjustment measures					Incremental Adjustment Measures				Parsimony-Adjusted Measures			
	X^2	RMSEA	RMR	GFI	AGFI	CFI	IFI Delta 2	TLI	NFI	PRATIO	PCFI	PNFI	AIC
Model 1	0.000	0.248	0.77	0.541	0.374	0.529	0.529	0.444	0.528	0.846	0.448	0.447	16397,499

Source: author

The indicators expressed in X2 point out a difference between the models, with the CMIN/DF (Minimum Discrepancy Function by Degrees of Freedom divided) of model 1 presenting 212.227 and its relationship with the degrees of freedom in CMIN/DF: 31.557, while the modified model exhibited the CMIN (Chi-square) in 19.772 with CMIN / DF at 4.943 being the second case considered acceptable by the literature (Dattalo, 2013). The RMSEA (Root Mean Square Error of Approximation) of the modified model is relevant because it has a value ≤ 0.005 (Asparouhov & Muthén, 2009).

The RMR (Root Mean Square Residual) of model 1 showed a value of 0.77 while the modified model was 0.03 considering the adequacy value at a level < 0.50, in turn, the standardized RMR of model 1 showed a value of 0.1730 against 0.257 of the modified models, with an acceptable value of ≤0.05 (Flora & Curran, 2004).

The GFI (Goodness-of-Fit Index) showed a mark of 0.529 in models 1 and 0.998, in the modified one, being considered adequate ≥ 0.95 and the AGFI (Adjusted Goodness of Fit Index) with an indicator of 0.374 and 0.990, respectively, considering adequate values ≥ 0.90 (Bentler, 1990).

CFI (Comparative Fit Index) indices; TLI (Tucker Lewis Index), the IFI Delta 2 (Incremental Fit Index) which calculate the relative adjustment of the observed model compared to the base model and the NFI (Normed Fit Index) that analyzes the discrepancy between the model's X2 value presented values ≥ 0.95, thus figuring in levels considered optimal (Hu & Bentler, 1999).

For the measures adjusted to parsimony, it is observed that the Pratio (Relationship of Parsimony) presented the value of 0.267; the PCFI (Parsimonious Comparative Fit Index) and PNFI (Parsimonious Normed Fit Index), presented the same value of 0.266 together with the comparison in the context of the AIC which for model 1 reached the mark of 16397.499 whereas the adjusted model indicated the value of 8915.966, leading to the finding that the modified model has the best fit (Byrne, 2010). The table 10 provides important points of observation.

Table 10 – Confirmatory Factor Analysis - indicators

Variables	Regression weights				Variances				Intercepts				Standardized regression weights		Multiple Square	
	Estimated	S.E.	C.R.	P	Estimated	S.E.	C.R.	P	Estimated	S.E.	C.R.	P				
Travel Safety	1.109	0.03300	33.516	***	0.312	0.009	35.224	***	3.433	0.023	173.554	***	0.615	0.378		
Convenience Boarding	1.586	.04000	40.126	***	0.326	0.011	29.469	***	3.907	0.014	228.060	***	0.737	0.543		
Time Convenience	0.775	.02900	26.438	***	0.287	0.008	37.964	***	3.755	0.014	255.422	***	0.494	0.244		
Expectation of Benefits	0.826	.02300	35.919	***	0.117	0.004	30.183	***	4.235	0.015	251.102	***	0.689	0.474		
Technological Availability	0.932	.0222	43.236	***	0.091	0.003	28.415	***	4.392	0.017	244.401	***	0.773	0.597		
Reduced Rate	1.000			***	0.083	0.003	26.039	***	4.222	0.015	243.281	***	0.806	0.649		

*** p <0.001

Source: author.

The values expressed in the table indicate that the p value of the proposed model is adequate considering the prerogatives of the literature that point to indices <0.001, with adequacy of the values expressed by "Standardized regression weights" and "Multiple squares" in addition to the absence of multicollinearity. Thus, the suitability of the modified model expressed in the path diagram is indicated by figure 2.

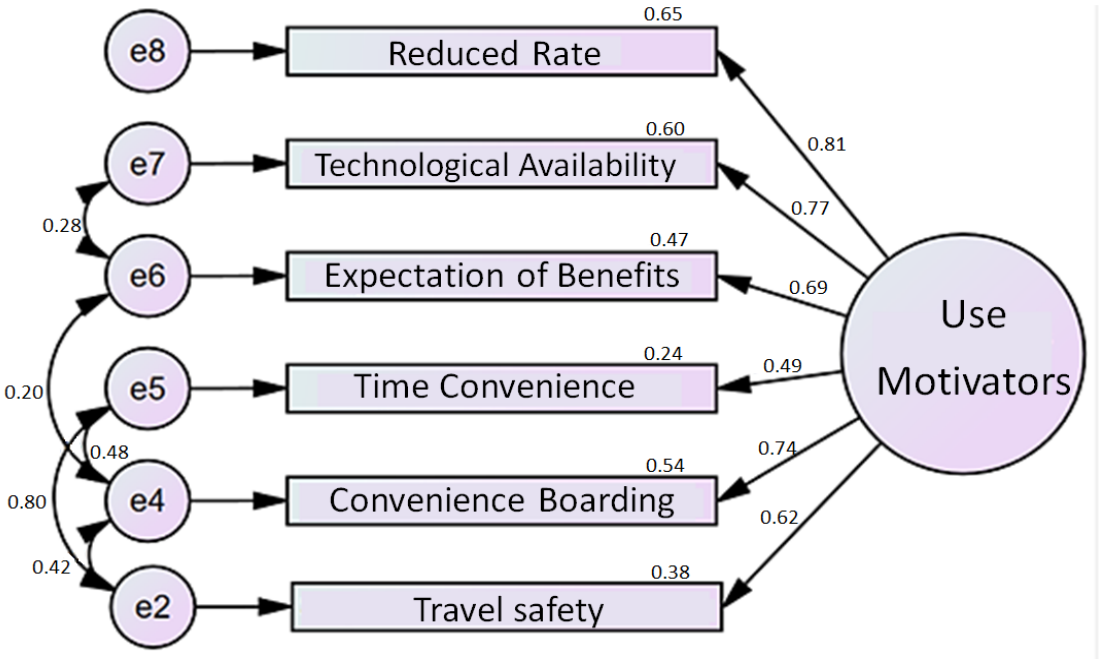

Figure 2 - Path Diagram. Source: author.

From the set of data shown in figure 2, it can be inferred that the national study is made up of three dimensions that guide consumption. It begins with the observation of the economic dimension, which has its representative pillar in the Reduced Rate, while the Elimination of Expenses variable did not figure among those representatives in the model.

The first variable is related to the direct and observed cost of travel and the second to the perspective of considering the total costs involved that are no longer spent, such as parking, maintenance, among others.

It is inferred that the user's perception of costs is centered on consumption immediacy and not on medium and long-term planning for the use of modals on demand, economic indicators such as those presented are supported by studies such as those by Young et al. (2020) and Shoman & Moreno (2021).

The second dimension highlights the socioeconomic variable Expectation of Benefits, which measures the use linked to the user's end objectives and not to the displacement itself and is related to the use of the service at less usual times, consumption of alcoholic beverages, avoid looking for or paying by parking, among hundreds of other possible personal interests, aspects observed in studies such as those by Dellaert (2019), Benjaafar & Hu (2020) and Acheampong et al. (2020).

The utilitarian sense of consumption prevails in this case, which in a certain instance is portrayed in studies such as those of NTU (2019), Mao et al. (2020), and Geissinger et al. (2020). The other variables of a social nature were not shown to be robust, in contrast to studies such as those by Pomering (2017), Nguyen-Phuoc et al. (2020) and Mont et al. (2020).

The technological dimension presents itself as a positive promoter of the user experience due to the availability of access platforms that provide ease of boarding, extended hours and reduced cost, intuitive service request and prior knowledge of the estimated cost. The results are echoed in studies such as those by Min et al. (2018), Malik & Rao (2019) and Hazan et al. (2019).

The environmental elements were not perceived by the Brazilian sample as having an impact on the consumption decision process, going against studies such as those by Ertz & Leblanc-Proulx (2018) and Curtis & Mont (2020).

The national results corroborate, at least in part, with studies such as those by Lavieri & Bhat (2019), Eckhardt et al. (2019), and Dias et al. (2019), but it is also close to the results measured in developing countries, such as Tirachini (2019) and Nguyen-Phuoc et al., (2020).

Conclusions

The study presents important indicators for the field of understanding the use of hitchhiking services in Brazil, mainly due to the sample size and geographic coverage (five major regions of the country) composed of important regional representatives.

The fact of having in the measured sample representatives from all regions of the country, no distinctions were observed in terms of variables influencing the consumption of on-demand services.

From the set of indicators, there is an indication that the environmental and social elements did not appear as distinctive in the consumer's perception.

Even considering the Expectation of Benefits variable, which appears in the socioeconomic dimension, it has a socio-environmental essence, on the contrary, it represents the utilitarian character of consumption differently from the hedonistic perception (linked to users who value the environment and people).

A second finding is that the technological facilitator presents itself as a robust outlining of the consumption behavior of users by bringing elements propitiated by the proliferation of internet 2.0, smartphones and their functionalities and the ability to offer services from platforms and / or applications. Thus, technology appears as an element that promotes this type of consumption in the country, a point corroborated by a wide range of studies, particularly international on the subject.

The beacons that emerged in the path diagram have in their essence the utilitarian sense of consumption and indicate the punctual concern of use and benefit of the service to the detriment of elements focused on the aspect of group awareness or even concern with the indicators related to socio-environmental aspects, for example.

Such indication leads to the perception that Brazilian users should not, for example, forego the acquisition / exchange of a motor vehicle for environmental principles whereas, in the occurrence of another similar travel offer that presents advantageous technological facilitators at reduced cost, the probability User migration tends to occur.

The study presents advances in the field of professional practice by highlighting the drivers of use and the nature of its support, while expanding the understanding in the theoretical field regarding the set of dimensions of influence of ride-hailing consumption in Brazil and allows its comparison with studies in developing or even developed countries considering their consumption decision beacons.

The study also presents a relevant contribution in relation to the understanding of the sector by revealing the punctual and utilitarian nature of consumption, in contrast to studies that show consumers with plans for the use of goods in the medium and long term with an underlying hedonistic posture to use.

This type of understanding is still recent among the researches that propose to deal with Ride Hailing, especially considering that part of the studies carried out come from the angle of view of the

researcher's interest, that is, if there is interest in the economic, environmental or social aspect of consumption structure, such direction ends up overlapping the scope of the analyses.

This study contributes to the field of knowledge by formulating the variables based on the results of national and international studies and submitting it to pre-tests capable of funneling consumer thinking, while presenting a robust explanatory model of the influence set. of consumption., such results alone are capable of directing studies linking the theme to aspects of city management, impacts on other modes of public or private travel, in addition to serving as a background to discuss legislation or even work rights, if be the focus of interest.

Future studies could expand the contextualization of the study in developing countries, with the aim of assessing whether the bases of consumption decision-making and the influence variables are consistent with the national study. Such an action would strengthen the understanding of the drivers of the use of ride-hailing.

DATA AVAILABILITY STATEMENT

The dataset that supports the results of this paper is available at SciELO Data and can be accessed viahttps://doi.org/10.48331/scielodata.TBUGRF

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