Article

"Sustainability" as a Motive for Choosing Shared-Mobility Services: The Case of Polish Consumers of Uber Services

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Abstract: (1) Background: Uber Technologies are currently changing the pattern of urban transport. Statista reports that in the period 2017–2019 alone, the average monthly number of active Uber users worldwide increased by 126.5%, and the average monthly number of Uber trips grew by 115%. The purpose of this article is to identify the most important motives encouraging both current and potential customers to use Uber "taxi" services. Particular attention was paid to the factor of perceiving these services as a more sustainable way of meeting transport needs. Uber creates its image specifically on the idea of sustainability. (2) Methods: The operationalization of the sustainability concept was based on three dimensions: ecological, social and economic. The CAWI (Computer-Assisted Web Interview) technique was used to collect the research data. The representative research sample covered 1003 Poles. A logistic regression model was used to analyze empirical data collected based on the survey. The data analysis used R program and the selected packages for this program. (3) Results: Among the most important motives, sustainability is the most frequently indicated. (4) Conclusions: The choices of Uber services are significantly influenced by the reasons related to two sustainability pillars—one social and one economic. The factors significantly influencing consumer decision-making processes related to the use of shared mobility services belong to the following groups of motives: sustainable development, knowledge of information and communication technologies (ICT), innovation, user convenience and savings. The findings from the study can become the basis for organizations and local authorities to undertake appropriate marketing activities to promote shared-mobility services (SMS) and support sustainable and environmentally friendly development.

Keywords: shared-mobility services; sharing economy platforms; uber; transport; sustainability; motives

1. Introduction

Shared-mobility services (SMS) remain a part of a wider sharing economy (SE) phenomenon developing in various spheres of the economy, i.e., finance, accommodation or transport. Today transport systems have become multimodal and the evolution of shared mobility has resulted in its many forms. It is about the shared use of a vehicle, motorcycle, scooter, bicycle, or other travel mode that provides users with short-term access to a transportation mode on an as-needed basis [1,2]. Accessing them is provided by the digital platforms related to Mobility-as-a-Service (MaaS) [3]. The presented SMS is defined as a type of the real-time car sharing based on location. The provision of these services is based on using geographic information systems (GIS) and technologies of global positioning systems (GPS) [4], combined with mobile technologies to organize shared rides arranged between drivers and passengers. Digital SMS platforms allow individuals using their car to transport others in return for a fee. In order to book a ride, customers use a smartphone application where they can additionally track the location of the required vehicle. Payment

is usually made via the app at the end of the trip. According to Transit Cooperative Research Program (TCRP) Report [5], the shared-mobility service has become one of the most ubiquitous forms of car sharing. The term "shared mobility" was introduced to describe a car-sharing service (i.e., a ride-sharing service which combines more than one trip) [6]. The Shared-use Mobility Center [7] states that Uber, established in 2009 by G. Camp and T. Kalanicka, has been the largest company providing such services to date. The Uber app was officially launched in 2010 in San Francisco. The Polish branch of Uber was registered in December 2013 as Uber Poland spółka z o.o., and on 19 August 2014, Uber started offering its services in Warsaw. Outside Warsaw, it can be used in Poland by the residents of Krakow (since April 2015), Tri-City (since June 2015), Poznań (since November 2015), Wrocław (since November 2015), Łódź, the Silesian Agglomeration and Szczecin (since September 2020). Uber offers various service packages, the available services in Poland are as follows: UberX, UberXL or UberSELECT (economic rides), UberSUV, UberBLACK and UberLUX (premium trips), rides for people with disabilities, UberPool (shared rides). Since 2017, the UberEats service (the possibility of food delivery) was introduced in Poland. Currently in Poland, Uber has a 50% market share of the rides ordered via applications [8].

The technological factor [9] and the issues of positive influence on sustainable development were initially recognized as the primary driver of SE growth, whereas a car as a resource not used by its owner became, in 95% cases, next to a power drill, a flagship example confirming the contribution of the sharing economy to sustainable development [10]. However, Gerwe and Silva [10] suggest taking into account the individual preferences and characteristics of those using the discussed services when estimating the total net impact of the car sharing services on sustainable development. It is only when the individuals decide to act as responsible consumers and take sustainability seriously that they become engaged in appropriate actions [11]. Responsible consumers take into account the social, environmental and economic impacts of their consumption [12]. Responsibility is becoming an important dimension of attitudes and behaviors as well as the determinant of their market choices [13]. It has been highlighted that only the right choices of all SE participants (service providers, platforms, consumers, policy makers) result in the achievement of sustainable development goals. The awareness of both positive and negative consequences of using transport within the sharing formula service provides the basis for making good decisions. It influences the motives and, in the science of choice, the motives behind actions remain the most important research problems. As the research review conducted for the purposes of this article has shown (see Section 2.3), there is a research gap regarding users and primarily the factors affecting their SMS choice.

The presented article attempts to answer the question of whether the perception of the services provided based on sharing as a more sustainable way of meeting transport needs is an important motive underlying their choice by consumers. The research space was limited to the customers of transport services offered through Uber—the platform currently ranked the highest in SE when it comes to passenger transport.

The purpose of this article is to identify the most important motives encouraging customers to use Uber "taxi" services. Special attention was paid to the sustainability factor.

The following research hypotheses were formulated and verified in the conducted empirical study:

Hypothesis 1 (H1). *The factors included in the Sustainability motive have a significant impact on the choice of Uber shared-mobility services.*

Hypothesis 2 (H2). *Using the Uber shared-mobility services is determined by factors included in the following motives: Knowledge of ICT, Innovativeness and Economic.*

Hypothesis 3 (H3). *Using the Uber shared-mobility services is not determined by the factors included in the following motives: Enjoyment and Risk and trust.*

The presented study addresses one of a few factors influencing consumer decisions about purchasing shared-mobility services based on the example of their largest provider—Uber. The originality and novelty of the research is the emphasis placed on sustainability as a factor in making consumer choices. This is the first study of Polish consumers and their motivations to use Uber, thus complementing the research conducted in the segment of Brazilians, Americans, Canadians and Australians.

Figure 1 presents a conceptual model containing research hypotheses verified based on the empirical data analysis.
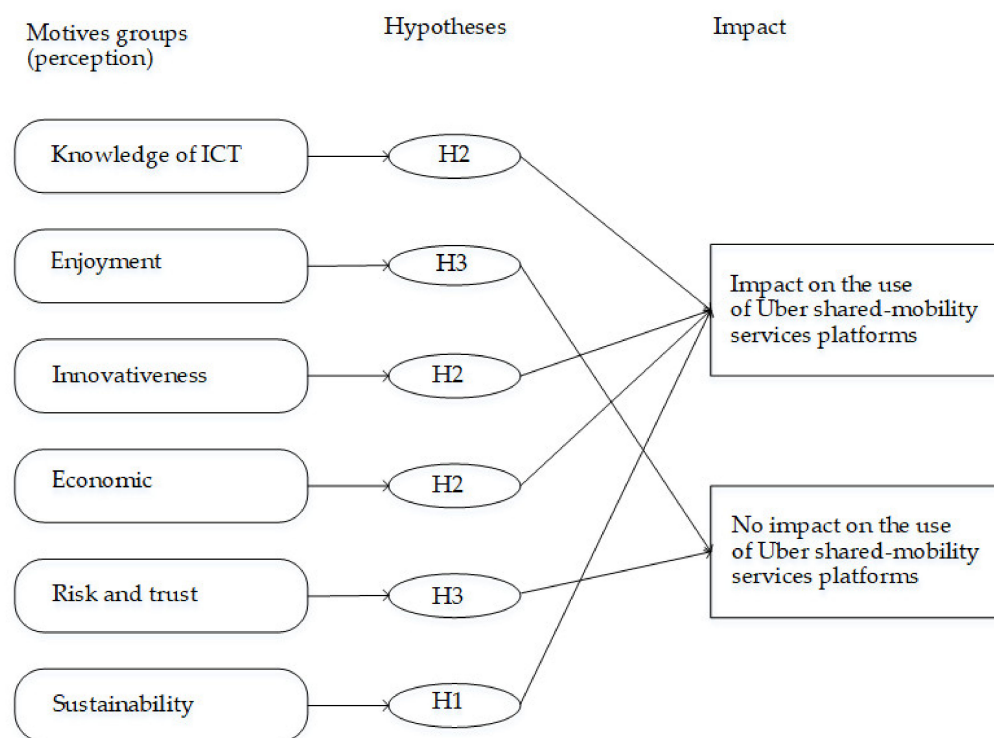

Figure 1. Conceptual framework and research hypotheses.

The article is organized as follows: Section 1 provides a review of the research addressing the incentives for using shared mobility. Section 2 addresses sustainability in relation to car sharing services as a research problem covered in previous studies. Section 3 describes the sources and methods of collecting data used in this study and presents the methodology applied to analyze the motives for using Uber services, whereas Section 4 presents the research findings. The last two sections discuss the results of previous studies and formulate both conclusions and implications of this study, including the identified limitations.

2. Theoretical Background

2.1. Shared-Mobility Motives

Shared-mobility service companies, including Uber, offer innovative and cheaper transport alternatives by reducing the marginal cost of service provision. These platforms are developing dynamically, offering a variety of services to meet diverse needs. Uber offers prearranged and on-demand transportation services in which drivers and passengers connect via digital applications, which are typically used for booking, electronic payment and ratings. Uber is included among the digital platforms related to MaaS. They enhance changes in social behavior in the market, which can be defined as transformations in the consumption model, i.e., moving from owning towards sharing [14,15], although as emphasized by Barbu et al. [16], neither of these consumption patterns are going to fade away. In their opinion, they will continue to coexist, expanding the range of the available consumer options. From the perspective of a user, SMS are developing very

dynamically primarily due to: the application availability and its many functions (e.g., new user data verification process through the application), user safety (monitoring drivers' driving and the control of trips made), user data security, payment data security and mobile application use security [17]. The research addressing SE is dominated by the studies covering accommodation and transportation services, where the authors' attention is mainly focused on Airbnb and Uber platforms.

The source literature on Uber provides analyses of the business model and factors behind its market success [18]. A frequently addressed research problem is the effect of introducing Uber to urban transport systems in different cities [19–23], taking into account the environmental impacts [24–27] and also the employment factor [28]. Much attention is paid to the issues of policy towards Uber and the regulations underlying its activities [29–31].

The motives are described in literature through the prism of many theories, the earlier ones such as, e.g., Maslow's Hierarchy of Needs or Herzberg's Motivation theory as well as the contemporary theories of motivation (e.g., Expectancy theory) [32], Acquier et al. [33] and Möhlmann [34], who proposed a division into external and internal motives, and Dann [35], who conducted a decomposition of push and pull motives. The theory of push and pull motivations is often used in the studies on motivation in tourism. People travel because they are propelled by the psyche (push) and drawn by external forces (pull) [36,37]. As Hossain [38] states, motivation stands for an essential issue when it comes to the success of SE initiatives, hence the motives represent an important problem in research where the authors' attention is focused both on the service providers and customers. Additionally, consumers' motives are identified in terms of users—non-users and, as shown by Hawlitschek et al. [39], non-users' motives are analyzed much less frequently. Most of the studies cover the accommodation sector. According to the analyses by Böcker and Meelen [40] and Hossain [38], there are gaps in the research on the motives followed by those using car sharing services and, as emphasized by Sung et al. [41], few of them discuss the motivations related to using platforms from the consumer's perspective. At this point, it is important to highlight the significance of focusing on the motives in various SE sectors, because as the research findings by Böcker and Meelen [40] show, they remain diversified depending on the analyzed field. According to these authors, SE should not be approached as one coherent phenomenon.

2.2. Sustainability

Sustainable development has been identified as one of the greatest contemporary challenges. Based on the review of the previously published papers on sharing economy, Ranjbari et al. [42] stated that sustainability is an important concept applied in research. According to the authors, shared mobility offers great opportunities for supporting sustainable development [23]. In the opinion of many researchers, sharing the unused resources contributes to the efficiency improvement of their use. In other words, SMS should result in both economic (additional revenues and savings), social (access to services, convenience, additional functionalities) and environmental benefits (reduction in energy consumption, greenhouse gas emissions, PM2.5 pollution and traffic congestion and noise) [1,3,43–47]. However, there is evidence that this positive impact of sharing on sustainability is not an unequivocal one [47]. Barnes et al. [45] indicate that the effect of reducing PM2.5 emissions may be temporary. The researchers analyzing one selected first-order effect usually resulting in findings confirming the positive impact of car sharing on the environment, society or economy [43,48–50]. In turn, those who perceive the problem in a broader perspective (second-order effects) are highly skeptical about this positive influence, e.g., Jung and Koo [47]. According to Codagnone et al. [51], in practice it has neither been sufficiently transparent nor reliably documented. Demonstrating the net impact in terms of environmental sustainability at an aggregated level is extremely difficult and complex [52]. As some researchers claim, the problem of economic effects of SE development as well as social and environmental issues should still remain the subject of scientific studies [53,54].

The source literature provides interesting analyses addressing the problem of sustainable development in the behavioral context of the sharing economy participants. However, they have certain limitations, because they refer to one selected market segment (quite frequently to generation Y) and/or one specific location (e.g., a selected city in the USA), as well as one sustainability pillar alone (e.g., related to the natural environment). The literature discussing Polish users of digital platforms offering transportation services provides the research covering young people using BlaBlaCar [55]. The recent analyzes, in turn, refer to the residents of Łódź using bikes offered under the municipal rental system [56]. While carefully comparing the results of these studies, and being aware of the limited possibilities for making such comparisons, the discrepancy in the conclusions formulated by the researchers becomes noticeable. Based on the results of empirical studies, some researchers confirm, e.g., the importance of environmental aspects related to using shared mobility, whereas others deny it [57]. Overall, it should be stated that the impact of environmental awareness of consumer behavior in the case of SMS [40,58] and the motivations for using Uber services have not been sufficiently analyzed as yet.

This article approaches sustainability using a broad perspective, through the prism of three pillars—social, economic and the natural environment. The idea of sustainable development understood in this way assumes improving the "quality of life" through further socio-economic development rather than at the expense of others, including future generations, and taking into account the requirements of human and nature rights. It adopts the reconciliation of ecological, economic and social reasons reflected in striving to achieve three basic goals: (1) halting environmental degradation and eliminating its threats, (2) meeting the basic material needs of humanity using techniques and technologies which do not damage the environment and (3) eliminating starvation, deprivation and poverty, ensuring health protection, development of human spiritual sphere, security and education [59].

2.3. The Motives for Using Transport Services via Uber—Previous Research

The source literature review, as mentioned in the previous section, revealed scarce scientific studies on the motivations for using Uber services. The analysis presented here applies a systematic approach towards analyzing earlier publications in the area under study. ScienceDirect database, often used in the sharing economy studies [60–62], was applied. The search was conducted in July 2021 and was divided into four stages: searching articles, searching documents, selecting documents and choosing documents for analysis (Table 1). The search and selection were carried out following the established categorization key.

Table 1. Searching and selecting the articles from **ScienceDirect database**.

Criteria for Searching and Selecting Articles	Number of Records	Description
		Stage 1
Searching articles	46.872	Keyword used: "shared-mobility service(s)"
		Stage 2
Searching documents	127	Search limited to: titles, abstracts and keywords, article publication period 2008–2021, the additional keyword was included in this option: "Uber"
		Stage 3
Selecting documents	96	Search limited to: full text document, review and research articles written in English

Table 1. *Cont.*

Criteria for Searching and Selecting Articles	Number of Records	Description
Stage 4		
Choosing articles The most relevant articles, consistent with the research problem, were selected	9	At this stage, to provide high quality research resulting from the advantage of the human mind over IT programs, the authors applied the traditional approach which involved reading the content of all articles (96) selected at the previous stage. After introducing the additional key word: motive/s, the search resulted in 22 results, two of which were included in the review as the relevant ones.

Nine literature items addressing the research problem discussed in this article were qualified for further in-depth content analysis (Table 2). They represent empirical articles covering studies on the factors determining the use of transport services purchased through SMS platforms. Most were published in the journals discussing the problems of transportation economics, management and geography, the majority of which (4) regarded transportation research (different parts: A, C, F). The earliest study was from 2018, and the results of the first research findings came from 2016. The spatial and numerical scope of the sample analyzed in the reviewed articles was highly diverse. The geographic coverage of four studies referred to the selected American regions and cities (California—two articles, Michigan and the Great Boston—one article each), two studies covered the Brazilians, one study was located in Canada (the Greater Toronto and Hamilton Area) and Australia (Adelaide). Depending on the research, the sample size ranged from 277 to 1975 people, most often selected through applying the non-random methods, e.g., using the quota sampling approach ensuring the appropriate number of respondents from each stratum adopted for the study present in the general population (identified based on various criterion, e.g., age, gender, race, geographical region, type of neighborhood) or the convenience sampling approach based on an easy access to the respondents (the sample structure is created automatically as a result of the research being joined by other willing individuals). The survey was conducted predominantly among the users. In three cases only both the users and non-users of Uber or the users of Uber and other transport options, different from Uber, were surveyed [63–65].

Table 2. Article review.

Alemi et al. [63]	
Purpose	To explore the factors affecting the adoption of on-demand ride services and to provide insights into the impact that the adoption of these services has on using other means of transportation.
Survey, sample (size, geographic focus)	An online survey N = 1975 Californian Millennials born between 1981 and 1997 (n = 1022), and Generation X born between 1965 and 1980 (n = 945)—California.
Theory/method	A binary logit models.
Findings	1. Highly educated, older millennials, who take higher numbers of long-distance business trips and have a higher share of long-distance trips, frequent users of smartphone transportation-related apps, who have previously used these services are more likely to use (or re-choose) Uber services. 2. The individuals with stronger pro-environmental, technology-embracing and variety-seeking attitudes are more inclined to use ride-hailing.

Table 2. *Cont.*

Alemi et al. [64]	
Purpose	To investigate the factors influencing the frequency of using ride-hailing and those affecting the adoption of these services.
Survey, sample (size, geographic focus)	An online survey N = 1975 Californian Millennials born between 1981 and 1997, and Generation X (1965- 1980).
Theory/method	A probit model with sample selection and a zero-inflated ordered probit model with correlated error terms.
Findings	Factors driving the use of Uber include more frequent use of smartphone apps to manage other aspects of their trip, frequent recreational travel by air, lower preference for owning a vehicle, and fewer safety/security concerns.
Soltani et al. [65]	
Purpose	To examine both ridesharing users and non-users (interested and non-interested) in the context of Adelaide.
Survey, sample (size, geographic focus)	A secondary data from a quantitative survey with the support of the Australian CRC Research Node for Low Carbon Living (CRC-LCL). N = 422 The six major activity centers (trip attractors) of the City of Adelaide, Australia.
Theory/method	A logit model, PCA and MNL modelling.
Findings	The following factors affect ridesharing in Adelaide: transport priorities (including ease, safekeeping, velocity and fitness); socio-economic characteristics (including individual characteristics and household characteristics) and also built environment attributes (including population density; employment density; intersection density; distance to CBD; house prices, and land use mix).
Vaclavik et al. [66]	
Purpose	To identify the motivations and trust elements of ridesharing apps and analyze the weight of motivation variables in the explanation of trust in the platform service.
Survey, sample (size, geographic focus)	N = 485 Brazilian users of a ridesharing app (Uber dominates the sample result with 74%/n = 369).
Theory/method	Factor analysis for user's motivation.
Findings	(1) The most significant variable that explains trust in the platform is: "Information providing", following by platform safety and platform security. (2) Pleasant participation, enjoyment, and cheaper alternative were also significant for trusting the platform. (3) Trust in the platform is higher than trust in drivers.
de Souza Silva et al. [67]	
Purpose	To evaluate the characteristics of the Brazilian demand for ridesourcing services and to assess the potential market for ride-splitting.
Survey, sample (size, geographic focus)	An online questionnaire was applied via Google Forms N = 500 16 Brazilian states from all regions of the country.
Theory/method	A logistic regression model.
Findings	The results show that the majority of ridesourcing trips are replacing taxi and public transport trips. Safety and cost are the main reasons that influence the decision of sharing trips via ride-splitting. The use of larger vehicles for sharing trips can introduce competition with the public transport systems. The ridesourcing interference on collective public transportation may be more noticeable than on the individual public transport (taxis), given the much greater demand for the former.

Table 2. *Cont.*

Habib [68]	
Purpose	To investigate the factors influencing the choice of Uber.
Survey, sample (size, geographic focus)	A travel diary The Transportation Tomorrow Survey (collected in Fall, 2016) of the Greater Toronto and Hamilton Area (U.S.) is a 5% sample (of the household population) travel survey. N = 162,700 households and 395,885 people.
Theory/method	A Semi Compensatory Independent Availability Logit (SCIAL) Model.
Findings	1. The mere consideration of Uber as a viable travel mode has a considerable influence on choosing it while comparing with the alternative modes. 2. Younger people consider Uber more often, and this is true for all genders. 3. Uber users were least sensitive to the travel time among all other mode users and its consideration as a travel model is influenced by its total cost.
Yan et al. [69]	
Purpose	To investigate public preferences for a mobility-on-demand (MOD) transit system versus a fixed-route transit system, with a particular focus on transportation-disadvantaged populations and to answer three questions: Do residents of low-income communities prefer a MOD transit system over a fixed-route system? What factors (e.g., the socioeconomic and demographic characteristics of a respondent, the transit services they receive currently, and their use and perception of public transit and ridesourcing services) shape their preferences? What are the potential benefits associated with MOD transit services that the individuals perceive, and what concerns do they have?
Survey, sample (size, geographic focus)	A stated-preference survey among the residents, neighborhoods of two low-income localities in Michigan—the City of Detroit and the Ypsilanti area (Ypsilanti Township and the City of Ypsilanti), US. n = 457 (Detroit) and n = 443 (Ypsilanti).
Theory/method	An ordered logit model.
Findings	The males, college graduates, individuals who have used ridesourcing before, and the individuals who currently receive inferior transit service from the fixed-route system are more likely to hold a more favorable perception of the MOD system. The preferences appeared to vary little by age, income, race, or disability status. The lacking access to a bank account, a smartphone, or the Internet at home or having a disability were not associated with the individual preference for MOD transit versus fixed-route. People who lack access to a mobile data plan had significantly weaker preference for MOD transit.
Gehrke et al. [70]	
Purpose	(1) to identify differences in the spatiotemporal patterns and individual characteristics of ride(1)-hailing passengers who adopt pooled versus standard exclusive services, model the individual-level social and trip-related predictors of ridesharing for different trip purposes.
Survey, sample (size, geographic focus)	An in-vehicle intercept survey of ride-hailing passengers. N = 944 The Greater Boston region (101 cities and towns of Metropolitan Boston), US.
Theory/method	Binary logistic regression models.
Findings	The three most popular reasons passengers stated regarding their adoption of ride-hailing services for the surveyed trips were believing in Uber/Lyft to be quicker than public transportation (60%), they did not have a car available (35%), or they stated parking is difficult or expensive (24%). The determinants of pooled ride-hailing trips were differentiated by the individual income and trip purpose.
Lee & Wong [58]	
Purpose	To investigate consumers' traffic attitudes and behavioral responses to on-demand ride-hailing.
Survey, sample (size, geographic focus)	The survey link, hosted on Qualtrics, was shared on the authors' social media platforms, i.e., LinkedIn and Facebook, and messenger groups such as WhatsApp and WeChat. N = 277
Theory/method	Structural equation modelling.
Findings	Price consciousness, perceived usefulness, ease of use, safety risk and customer value exert a significant influence on the word-of-mouth (WOM), a manifestation of attitudinal loyalty towards ride-hailing.

The previously performed studies collected information on many categories, including: socio-demographic characteristics of SMS users, their attitudes, preferences, motivations, behavior, lifestyle, using new information and communication technologies (the Internet, social media), owning vehicles, the adoption, intention and frequency of using on-demand ride services, situations in which the respondents use this type of service, using other travel modes (public transport, taxi, own car) and the perception of environmental concerns or shopping habits.

The analysis of the research findings considered in this article indicates that the reasons/motives influencing the decision of SMS may depend on the local conditions (e.g., the safety situation in a given country/region, the quality of public transport services, the condition of social welfare). For example, the research covering the users of ridesharing services in 16 Brazilian cities showed that the most important selection criteria were lower tariffs, the number of people sharing a ride as well as security and safety. Whereas in Adelaide, Australia: population density, housing value, higher levels of education and income, casual work status, younger age and access to smartphones were among the key factors associated with higher ridesharing use, or higher interest in ridesharing.

The researchers emphasize the existing paucity of data on SMS customers, their ways of using on-demand transport services as well as changes in their travel behavior resulting from the development of shared mobility systems [63].

3. Materials and Methods

3.1. Survey and Sampling Method

The empirical data were collected based on a survey carried out using a questionnaire. The sampling and data collection was commissioned to a research agency—IMAS International Branch in Wrocław, Poland. The research covered 1003 respondents. The studied sample was representative for the general population of Poles aged 18–64 in accordance with the following five characteristics: gender, age, region, size of the town and education. IMAS selected a representative sample of the respondents based on a statistical sampling model. The CAWI technique was used to collect the data. The research was conducted in September 2020.

3.2. Measurement Items

The measurement scale applied in the survey was developed based on the scales used in previous studies presented in Table 2. These studies provided groups of motives (perception areas, measurement positions), which function as aggregates of factors influencing the examined phenomenon. The authors developed detailed statements and questions, as well as the response measurement scales, adjusting them to the specificity of the analyzed population. They are listed in Table 3. Motive groups, taking the model approach represent dependent variables shaped by the explanatory variables (items).

Table 3. Measurement items.

Motive Group	Item	Reference
Knowledge of ICT	K1. I have knowledge of the services offered by sharing platforms K2. I can use sharing platforms K3. I can use mobile applications for sharing platforms	[58,63,64,66]
Enjoyment	E1. I enjoy using Uber platform E2. It is a unique experience to use the services purchased through sharing platforms E3. Using the services purchased through sharing platforms offers an opportunity to experience adventure E4. Direct contact with Uber drivers facilitates participation in the local entertainment, rituals and customs	[63,66]

Table 3. *Cont.*

Motive Group	Item	Reference
Innovati-veness	I1. Currently, using the services purchased through sharing platforms is trendy/fashionable I2. Using the services purchased through sharing platforms is an expression of modern lifestyle I3. Direct contact with Uber drivers facilitates acquiring new skills, e.g., linguistic, culinary, etc.	[58,63,68]
User convenience and savings	C1. Uber means no parking problems and fees C2. Uber's reaction to an order is faster than that of a traditional taxi C3. Travel time with Uber is shorter than by a traditional taxi/private car C4. Travel time with Uber is shorter than using public transport C5. Traveling with Uber is cheaper than using a traditional taxi	[58,63–69]
Risk and trust	R1. Using the services purchased through sharing platforms reduces the stress of tourist travel R2. The services purchased through sharing platforms reduce the risk of contracting a disease (e.g., COVID-19) R3. Sharing personal data with platforms is dangerous R4. I'm never sure about the quality of Uber service R5. Using Uber services is dangerous	[58,64–67]
Sustainability	S1. Using the services purchased through sharing platforms is an alternative to a consumptive, wasteful lifestyle S2. Using the services purchased through sharing platforms is an ethical and environmentally friendly way of meeting needs S3. Using the services purchased through sharing platforms results in direct benefits for the residents of the locations I visit S4. The services purchased through sharing platforms allow immersing in everyday life of the residents and the authentic culture of the places I visit S5. The services purchased through sharing platforms replace the inaccessible traditional services	[58,64,66,67,70]

3.3. Data Analysis

The purpose of the study is to identify the most important factors influencing the motives which impact on the decisions made by those who use or do not use Uber services (items in Table 3). The respondents were asked to answer the following question: "Have you ever personally purchased a (Uber) service through online sharing platforms?" The collected data show that 216 respondents answered "Yes", 628 respondents—"No" and 159 respondents—"I do not know this platform". The study was aimed at understanding the significance of the factors influencing the use or non-use of Uber services, as well as the power and direction of their impact. The responses "Yes" and "No" (844 respondents in total) were considered, excluding the option "I do not know this platform". The logistic (binary) regression model was used in the analysis of empirical data, which describes the relationship between the choice or non-choice of Uber (dependent variable) and the factors determining the decision making (explanatory variables included in the specified motives).

Probabilistic logistic regression models are very often used in the research on economic choices [67,70–76]. If the explanatory variable y_j is a dichotomous one (binomial, zero-one), it takes one of the two values in accordance with the following rule:

$$y_i = \begin{cases} 1, & \text{choice,} \\ 0, & \text{no choice.} \end{cases} \tag{1}$$

The occurrence of a specific event can be approached very broadly and in various economic contexts. This may be, e.g., the fact that an object has a certain feature, making a specific decision, choosing one of the offered options, purchasing a certain good or service, a company becoming successful in the market or its bankruptcy, etc.

The values of y_j dependent variable in formula (1) stand for the probabilities influenced by the implementation of x_j explanatory variable, which is described by a linear regression model with one explanatory variable in the below form:

$$y_i = \alpha_0 + \alpha_1 x_j + \varepsilon_i \tag{2}$$

where α_0, α_1—model parameters; ε_i—random component presenting the following distribution $\varepsilon_i \sim IN(0, \sigma^2)$.

However, it can be shown that the systematic component of the model (2), i.e., $\alpha_0 + \alpha_1 x_j$, may take values different from 0 and 1. Therefore, the theoretical values of $\hat{y}_j$ probabilities estimated based on the model (2) may be higher than 1, lower than 0 or included in the range [0, 1], whereas $\hat{y}$, as indicated by the dependence (1), should be equal to either 1 or 0. In order to ensure the accuracy of the results obtained using model (2), the logit transformation of probability is performed.

The logistic regression model takes the following form:

$$p_i(y_i|x_j) = \frac{e^{\alpha_0 + \alpha_1 x_j}}{1 + e^{\alpha_0 + \alpha_1 x_j}} \tag{3}$$

where p_i stands for a conditional probability meaning that y_i dependent variable takes the value equal to 1 for the value of x_j explanatory variable.

The logistic regression model (3) can be written down using the odds ratio in the form of a logit model:

$$\text{logit}(p_i) = \ln \frac{p_i}{1 - p_i} = \alpha_0 + \alpha_1 x_j \tag{4}$$

In the analysis of empirical data collected based on the survey, a logistic regression model was used in which the dependent variable represents choosing or declining Uber services and the explanatory variables stand for the factors which determine taking this decision, included in a specific motive:

$$P(Y = 1|X) = \frac{e^{\alpha_0 + \sum_{j=1}^{m} \alpha_j \cdot x_j}}{1 + e^{\alpha_0 + \sum_{j=1}^{m} \alpha_j \cdot x_j}} \tag{5}$$

where $\alpha_0, \alpha_j, j = 0, \ldots, m$—model parameters (regression coefficients); $x_j, \ldots, x_m$—explanatory variables (items); m—number of explanatory variables for a specific motive.

To estimate the parameters of the logistic regression model, the concept of Generalized Linear Models (GLM) proposed in the article [77] and developed in the monograph [78] is used.

The parameters of the logistic regression model (5) can be interpreted in terms of probability taking into account the sign of the parameter + or − ($+\alpha_j$ or $-\alpha_j$). The sign of the parameter informs about the direction of the explanatory variable influence on the values of the dependent variable ($Y = 1$ or $Y = 0$):

- an increase in the value of the explanatory variable with a positive parameter ($+\alpha_j$) increases the probability of answering "Yes" (taking the value 1 by Y dependent variable);

- an increase in the value of the explanatory variable with a negative parameter $(-\alpha_j)$ increases the probability of answering "No" (taking the value 0 by Y dependent variable).

The parameters of the logistic regression model can also be interpreted in terms of the odds ratio. In such a case the Equation (5) takes the below form:

$$\frac{P(Y=1|X)}{1-P(Y=1|X)} = e^{\alpha_0 + \sum_{j=1}^{m} \alpha_j \cdot x_j} \tag{6}$$

The left side of the Equation (6) means the chance of taking the value of 1 by Y dependent variable (choosing Uber). The numerical values of the odds ratios are calculated based on e^{α_j} exponential expression in which the power exponent is the estimated value of the α_j ($e^{\alpha_j} = \exp(\alpha_j)$, $\ln e^{\alpha_j} = \alpha_j$) parameter. If the value of the explanatory variable increases by a unit, then the chance of taking the value of 1 by Y dependent variable will change (increase, decrease) by e^{α_j} times. The interpretation of the numerical values of the odds ratios is provided below:

- if $\exp(\alpha_j) > 1$, then the influence of the variable value on the choice of option 1 is positive (higher odds ratio);
- if $\exp(\alpha_j) < 1$, then the influence of the variable value on the choice of option 1 is negative (lower odds ratio);
- if $\exp(\alpha_j) = 1$, then the influence of the variable value on the choice of option 1 is neutral (the odds ratio remains unchanged).

A logistic regression model was estimated for the factors determining either choosing or not choosing Uber broken down into 6 groups of motives. The dependent variable takes the values of 1 or 0 (844 observations in total). Defining the value of Y dependent variable—using or not using Uber services:

- Y = 1—respondents using Uber (transport)—216,
- Y = 0—respondents not using Uber (transport)—628.

The explanatory variables were assigned to the six motives using the specificity of the questions answered by the respondents (see Table 3). In the questionnaire, the respondents' answers to the questions representing the explanatory variables (items) were measured using the Likert scale in the range from 7—"I definitely agree" to 1—"I definitely disagree".

The significance of the entire model was assessed based on the likelihood ratio (LR) test. The test statistics takes the following form:

$$LR = -2\ln\left(\frac{L(model1)}{L(model2)}\right) = 2(\text{loglik}(model1) - \text{loglik}(model2)) \tag{7}$$

where *model*1—less restrictive model; *model*2—more restrictive model; loglik—the natural logarithm of the likelihood function for the estimated model.

The LR statistics has χ^2 distribution with the number of degrees of freedom equal to the number of explanatory variables.

The data analysis was performed using R program and the selected packages for this program [79–87].

4. Results

4.1. Sample Analysis

The representation of both genders were among 1003 surveyed Poles (Table 4), with the largest age group representing between 26 and 35 years of age (over 24.3% indications). The majority of the respondents were secondary education graduates (the total of over 36.7% respondents). Residents of villages constituted the largest group of the respondents (39.9%). Among the remaining respondents, the dominant group included people living in medium-sized cities (taking into account Polish conditions) from 21 to 100,000 residents. Three-person households were dominant (28.5%). Approximately 50% of the respondents did not have minor children. The majority (approximately 75%) of the respondents had a

monthly net income per person in a household lower than the average net salary in Poland (PLN 3938 October 2020). Two thirds of the respondents owned a car, and every fourth respondent was not using a car.

Table 4. The characteristics of the research sample.

Respondents' Particulars	Categories	All Respondents (N = 1003; 100%) n	%	Uber Non-Users (N = 787; 78.5%) n	%	Uber Users (N = 216; 21.5%) n	%
Gender	Female	507	50.5	402	51.1	105	48.6
	Male	496	49.5	385	48.9	111	51.4
Age	18–25	141	14.1	86	10.9	55	25.5
	26–35	244	24.3	189	24	55	25.5
	36–45	238	23.7	190	24.1	48	22.2
	46–55	183	18,2	160	20.3	23	10.6
	55–60	120	12	95	12.1	25	11.6
	Over 60	77	7.7	67	8.5	10	4.6
Education	Primary	26	2.6	23	2.9	3	1.4
	Lower secondary	38	3.8	28	3.6	10	4.6
	Vocational	341	34	279	35.3	62	28.7
	Secondary	398	39.7	304	38.6	94	43.5
	Higher—Bachelor's degree	51	5.1	34	4.3	17	7.9
	Higher—Master's degree	142	14.2	113	14.4	29	13.4
	Higher—PhD	7	0.7	6	0.8	1	0.5
Residence	Village	400	39.9	333	42.3	67	31
	Up to 20,000 residents	126	12.6	103	13.1	23	10.6
	From 21 to 100,000 residents	195	19.4	158	20.1	37	17.1
	From 101 to 200,000 residents	81	8.1	65	8.3	16	7.4
	From 201 to 500,000 residents	84	8.4	55	7	29	13.4
	Over 500,000 residents	117	11.7	73	9.3	44	20.4
Region of Poland (voivodship)	Dolnośląskie	78	7.8	60	7.6	18	8.3
	Kujawsko-Pomorskie	60	6	52	6.6	8	3.7
	Lubelskie	52	5.2	40	5.1	12	5.6
	Lubuskie	26	2.6	22	2.8	4	1.9
	Łódzkie	77	7.7	64	8.1	13	6
	Małopolskie	82	8.2	61	7.8	21	9.7
	Mazowieckie	130	13	96	12.2	34	15.7
	Opolskie	27	2.7	24	3	3	1.4
	Podkarpackie	62	6.2	53	6.7	9	4.2
	Podlaskie	29	2.9	26	3.3	3	1.4
	Pomorskie	56	5.6	35	4.4	21	9.7
	Śląskie	127	12.7	101	12.8	26	12
	Świętokrzyskie	21	2.1	17	2.2	4	1.9
	Warmińsko-Mazurskie	38	3.8	36	4.6	2	0.9
	Wielkopolskie	95	9.5	65	8.3	30	13.9
	Zachodnio-pomorskie	43	4.3	35	4.4	8	3.7
Number of household members	1 person	76	7.6	64	8.1	12	5.6
	2 persons	259	25.8	214	27.2	45	20.8
	3 persons	286	28.5	216	27.4	70	32.4
	4 persons	225	22.4	170	21.6	55	25.5
	5 persons	100	10	79	10	21	9.7
	6 persons or more	57	5.7	44	5.6	13	6

Table 4. *Cont.*

Respondents' Particulars	Categories	All Respondents (N = 1003; 100%) n	%	Uber Non-Users (N = 787; 78.5%) n	%	Uber Users (N = 216; 21.5%) n	%
Number of children up to the age of 18 in a household	Not even one	494	49.3	396	50.3	98	45.4
	1 child	236	23.5	165	21	71	32.9
	2 children	139	13.9	115	14.6	24	11.1
	3 children	49	4.9	39	5	10	4.6
	4 children	9	0.9	8	1	1	0.5
	5 children	0	0	0	0	0	0
	6 and more children	0	0	0	0	0	0
	No answer	76	7.6	64	8.1	12	5.6
Monthly net income per person in a household (PLN)	Up to 1000	143	14.3	128	16.3	15	6.9
	1001–2000	304	30.3	248	31.5	56	25.9
	2001–3000	304	30.3	222	28.2	82	38
	3001–4000	123	12.3	91	11.6	32	14.8
	4001–5000	66	6.6	49	6.2	17	7.9
	Over 5000	63	6.3	49	6.2	14	6.5
Owning/using a car	My property	670	66.8	521	66.2	149	69
	Leased	9	0.9	8	1	1	0.5
	Borrowed from family/friends	57	5.7	37	4.7	20	9.3
	I don't use the car	267	26.6	221	28.1	46	21.3

The representation of the surveyed sample allowed determining the actual indicator of meeting transport needs of Poles via the Uber platform. It amounted to 21.5%, which indicates that every fifth Pole uses Uber services. The demographic and socio-economic characteristics of Uber users and non-users are presented below (Table 4).

Regarding Uber users, it should be stated that they include: women and men, young people (between 18 and 35 years of age), secondary education graduates living in Mazowieckie, Wielkopolskie and Śląskie regions and in a large city with more than 100,000 residents (in Poland out of the total of 954 cities, 36 cities are inhabited by over 100,000 residents). Comparing the data on the place of residence by the city size and the region indicates that the average Uber user lives in Warsaw (1,794,166 residents) or Poznań (532,048 residents). Along with the city size, the number of Uber users increases against the non-users, whereas the number of non-users increase with age. The majority of Uber users live in a household consisting of three or four members, with one child up to the age of 18, with a monthly net income amounting to PLN 2001–3000 per household member. A total of 69% of the respondents own a car, and every fifth car is not used. Referring the latest data to non-users, the findings show an interesting correlation that the majority of people not using Uber do not use their own car either.

4.2. Findings

Taking into account the sign of the estimated parameter in model (5) describing the impact direction regarding the probability of choosing Uber services (estimate) and the odds ratio value describing the chance of choosing Uber services (odds ratio), the most important factors stimulating the choice of Uber services in the groups of motives (Knowledge, Innovativeness, Sustainability, User Convenience and Savings) are as follows:

1. K1. I have knowledge of the services offered by sharing platforms;
2. I3. Direct contact with Uber drivers facilitates acquiring new skills, e.g., linguistic, culinary, etc.;
3. I1. Currently, using the services purchased through sharing platforms is trendy/fashionable;
4. S5. I use the services purchased through sharing platforms which replace the inaccessible traditional services;

5. S4. The services purchased through sharing platforms allow immersing in everyday life of the residents and the authentic culture of the places I visit.;
6. S3. Using the services purchased through sharing platforms results in direct benefits for the residents of the locations;
7. C1. Uber means no parking problems and fees.

The factors that also positively, but less clearly, influence the choice of Uber services in the groups of motives (Enjoyment, Innovativeness, User Convenience and Savings, Knowledge of ICT) include:

8. E1. I enjoy using Uber platform;
9. I2. Using the services purchased through sharing platforms is an expression of modern lifestyle;
10. C4. Travel time with Uber is shorter than using public transport;
11. K3. I can use mobile applications for sharing platforms;
12. C5. Traveling with Uber is cheaper than using a traditional taxi.

In the case of other factors, both the sign of the estimated parameter describing the impact direction regarding the probability of choosing Uber services (estimate) and the odds ratio value describing the chance of choosing Uber services (odds ratio) indicate that the increasing values of these items reduce the likelihood of using Uber services or their impact remains neutral. The most important factors are as follows: E4, C2, E3, R4, R3 and C3, and they characterize non-Uber choices. The detailed results are presented in Table 5 (the factors stimulating the choice are presented at the grey background).

Table 5. Logistic regression model estimation results for motive groups.

Variable	Estimate	Std. Error	z Value	Pr(>|z|)	odds.ratio
Knowledge of ICT					
K1	0.166	0.053	3.118	0.002	1.181
K2	−0.056	0.056	−0.99	0.322	0.946
K3	0.014	0.057	0.237	0.812	1.014
Enjoyment					
E1	0.028	0.045	0.623	0.533	1.028
E2	−0.063	0.074	−0.847	0.397	0.939
E3	−0.131	0.082	−1.587	0.113	0.877
E4	−0.186	0.075	−2.475	0.013	0.831
Innovativeness					
I1	0.131	0.079	1.648	0.099	1.14
I2	0.035	0.085	0.41	0.682	1.035
I3	0.124	0.074	1.667	0.096	1.132
User Convenience and Savings					
C1	0.053	0.079	0.666	0.505	1.054
C2	−0.146	0.07	−2.078	0.038	0.864
C3	−0.092	0.058	−1.592	0.111	0.912
C4	0.024	0.083	0.292	0.771	1.024
C5	0.007	0.079	0.089	0.929	1.007

Table 5. *Cont.*

Variable	Estimate	Std. Error	z Value	Pr(>|z|)	odds.ratio
		Risk and trust			
R1	−0.002	0.066	−0.028	0.978	0.998
R2	−0.031	0.044	−0.706	0.48	0.969
R3	−0.096	0.051	−1.885	0.059	0.908
R4	−0.098	0.047	−2.096	0.036	0.907
R5	−0.043	0.048	−0.904	0.366	0.958
		Sustainability			
S1	−0.02	0.064	−0.319	0.75	0.98
S2	−0.048	0.072	−0.659	0.51	0.953
S3	0.08	0.073	1.101	0.271	1.084
S4	0.115	0.077	1.503	0.133	1.122
S5	0.121	0.08	1.512	0.13	1.128

Likelihood ratio test

	#Df	LogLik	Df	Chisq	Pr(>Chisq)
1	26	−437.77			
2	1	−480.03	−25	84.518	2.198×10^{-8}

Among the factors having the strongest impact on the choice of Uber services, three represent the Sustainability motive, which allows adopting the H1 hypothesis.

Other factors significantly affecting the probability of using Uber services belong to the following groups of motives: Knowledge of ICT, Innovativeness, User Convenience and Savings, which means positive verification of H2 hypothesis.

Factors that reduce the probability of using Uber services included the groups of Enjoyment and Risk and trust motives, which allow us to adopt the H3 hypothesis.

5. Discussion and Conclusions

The conducted research provides interesting conclusions. Among the most important motives, the Sustainability group remains the most numerous. The choices of Uber services are significantly influenced by the reasons related to two sustainability pillars—social and economic. For Polish Uber users, it is important to be able to use Uber services when a traditional taxi is unavailable. Shared-mobility services can, therefore, make an important contribution to solving the problem of transport and exclusion, broadly described by Church et al. [88], and optimization of the structure of urban transportation systems [89,90]. Campisi et al. [91] noticed that demand responsive or shared services can complete the public transport system. The shared mobility operators fulfill public transport gap, rather than offer a competing service (2).Uber is also attractive due to the possibility of personal contact with drivers who are perceived as residents of a given city, providing authentic experiences, knowledge about the local customs, values, and entertainment not available otherwise (social aspect). The respondents, aware that the choice of Uber services contributes to the increased income of the local population (the economic aspect of sustainability), use this type of transport services. In turn, the environmental pillar (motives related to the protection of natural environment), in the case of Polish users, slightly reduces the chance of choosing Uber services. This is not an isolated case. In the research conducted by Chu, Hamza and Laberteaux [57]; Vaclavik et al. [66], the pro-ecological attitude was not discovered to be an important factor in the respondents' decisions regarding the use of call-a-ride services. Nevertheless, the results of various studies addressing this problem are not unequivocal. Alemi et al. [63] showed that people with a stronger pro-ecological attitude are more likely to use Uber. The non-homogeneity of research conclusions may result from cultural diversity of the analyzed segments. The environmental factors are

not important in the decision-making process of choosing Uber services, as in the case of Brazilians surveyed by Vaclavik et al. [66].The Innovativeness group is represented by two motives, which means it has a significant positive impact on increasing the probability of choosing Uber services. On the contrary, Lee and Wong [58], in their study did not observe any significant impact of personal innovation on using these services.

The User Convenience and Savings and Knowledge of the ICT group of motives showed one significant factor each. In the economic sphere, it was a release from problems with parking and parking fees. Similarly, in the studies by Rayle et al. [92], one of the important motives for increasing the likelihood of using Uber services was reducing the inconvenience related to parking. The economic aspects were also highlighted in Qiu's research, who identified the surplus of Uber consumer in San Francisco [93].

In this study, among all the motivations behind choosing Uber, the Knowledge of ICT motive, i.e., the respondents' knowledge about the services provided by this platform turned out to be the most important one.

The following groups of motives are not represented in this study: Enjoyment as well as Risk and trust. These motives were analyzed by Vaclavik et al. [66]; however, they resulted in diverse observations. Enjoyment proved to be one of the three most critical reasons for choosing Uber, and the security risks did not prevent respondents from requesting a ride.

This is the first empirical study of the ridesharing set in Poland to employ survey data (according to [65]). It is also one of few that offer a thorough study of the motives responsible for using Uber platform services from the perspective of consumers with a particular emphasis on sustainability. The article provides a thorough review of the scientific literature. The authors identified nine publications in scientific journals addressing this problem. This constituted the basis for determining the research gap and proposing the authors' own research instrument (scale) allowing the measurement of many aspects in an integrated manner (economic, social and ecological). As emphasized by K. Turoń [89], thus far, the focus has been mainly on economic, technical, transport, environmental and legal aspects, disregarding social elements.

6. Implications, Limitations and Future Research

The researchers indicate the evident paucity of data on SMS customers, their ways of using on-demand transport services as well as changes in their travel behavior resulting from the development of shared mobility systems [61]. Without this knowledge, it is difficult to provide a reliable assessment of the impact of SMS on the broadly approached environment, including its effects on sustainable development.

The findings resulting from this article provide useful information on the consumer decision-making processes related to shared-mobility services. The discussed significance of the motives for choosing Uber services, with particular emphasis on sustainability, can become the basis for the appropriate marketing activities to be undertaken by the organizations and local authorities promoting sustainable mobility alternatives and help transport planners to predict changes in the demand for such services and support planning changes in the city transport networks. This information may be important for the Uber platform itself in the process of improving the solutions used in promotion and also for the created image pillars. Moreover, when analyzing the results of previous studies conducted in Brazil, Canada, the USA and Australia (discussed in Table 2), the cultural differences related to motivations for choosing car-sharing services must be addressed. These discrepancies should be considered by Uber and such operators in their local promotional campaigns. Ridesourcing services may also have negative aspects that were not covered in this study, such as increased congestion or their accessibility for people with disabilities. The analysis of motives did not take into account the diversified services being provided by Uber (Uber Pool, Uber Green), which resulted from the unavailability of this type of offer in Poland at the time of conducting the research.

Because the existing research has focused on users rather than non-users, much less is known about the latter. Who are they, and why do they shun this novel mobility model? Understanding the characteristics, behaviors and motivations of non-users is quite important too, if the planning goal is to shift urban populations from private car ownership and start using ridesharing (according to [63]). In-depth research on the motives of using Uber services, user profiles, as well as barriers limiting the usage should define the direction for further research in order to understand better and use SMS to improve the efficiency of urban transport systems, social inclusion and sustainable transport development. The motives for undertaking this type of professional activity by self-employed drivers using car-sharing platforms should represent the direction to follow in future research addressing shared-mobility services.

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