Preferences for car sharing service attributes among university students: Evidence from an emerging market*

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Abstract

Car sharing is a specific business model that allows a new form of personal mobility. University students, generally very receptive to the concept of a sharing economy, are recognized as a prospective customer group for car sharing operators. This paper proposes an ex ante analysis that aims to reveal how students from an area where car sharing is underdeveloped perceive this mobility option. University students in Belgrade were asked to state their preferences regarding a mix of attributes and levels replicating service design from current practice. Preferences for particular service attributes were explored using stated preference survey and Choice-Based Conjoint analysis, while further preference-based segmentation was obtained using the Partitioning Around Medoids method. The contribution of this work is that it delivers findings on an emerging car-sharing market where there is very little research on user profiles. From a methodological point of view, we form distinctive customer clusters based on the uniformity of their preferences. By being aware of users' prior expectations, service providers can determine their operational priorities more easily when unlocking the market. The paper outlines both the similarities and differences between students in an emerging market and their counterparts in more developed countries. Our findings reveal that the student population is homogeneous regarding critical aspects of service adoption like cost, distance to vehicles, and parking convenience. Specific service attributes such as the pricing scheme and keeping vehicles clean are found to be issues of peculiar interest in our study market. Although our proposed approach to shaping user preferences was developed for car sharing analysis it is applicable to other service-oriented businesses in the initiation phase.

Keywords: car sharing service, university students, stated preferences, choice-based conjoint analysis, market segmentation, emerging market
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Introduction

Car sharing is a specific mobility service and one of many business segments that fall under the umbrella of a sharing economy. This on-demand and membership-based service is typically seen as short-term car rental but allows for long-term rentals as well. From the perspective of individual users, sharing a vehicle enhances mobility options for the carless population and can reduce personal transportation costs (Boyaci/Zografos/Geroliminis 2015). As it accommodates occasional car usage, car sharing fulfils the mobility needs of those who cannot afford or do not wish to buy a car. Although the idea of sharing cars dates back to the 1940 s, the growth of this transportation option occurred much later. The development of information and communication technologies (ICT) provided considerable impetus for its wider implementation. Car sharing operators use ICT to manage their fleet in terms of distribution, utilization, and maintenance, while users benefit from an improved reservation system. Projections from the 1990 s regarding growth of the industry appear to have been over-optimistic, but the global trend is promising (Shaheen/Cohen 2016). This has been particularly true over the last few years, with the launch of new forms of service. The most flexible free-floating business model, where vehicles can be accessed and left at any public parking lot within a designated zone (the so-called operating or business area) relies strongly on ICT and is a chance for car sharing to expand from a niche market into the mainstream.

Measured by service per capita, the largest market is currently Europe, followed by North America, The Asia-Pacific region stands out in terms of total number of users due to its large customer base. When it comes to particular countries, worldwide development is uneven. In some countries the service is well developed and has a long tradition, while others are new to the car sharing business. In these countries the service is expected to develop or is in an experimental phase, and we consider them as emerging car sharing markets. In less-developed countries car sharing still appears a luxury service despite its potential benefits and flexibility, This raises the questions of whether its implementation should be deferred and how the market should be approached. The World Resource Institute (WRI 2015) has reported that early adopters, i. e., the typical users in developing nations, have a similar demographic profile to users in established car sharing markets. The report observes that cultural desire for car ownership is more pronounced in developing nations, but that this has not been found a barrier to car sharing if the service is properly marketed. It also reports that in emerging markets, students are a prospective customer group in terms of adopting car sharing, primarily because they are more open to new, ICT-based services and receptive to the sharing economy.

Current practice shows that university students are an important target audience for operators. This customer group is favourable because students are just start-

ing to make travel decisions and their commuting habits have not yet been formed, making it possible to break into this market (Davison/Ahern/Hine 2015). In addition, owning a car may well be uneconomical for this customer group because their need for a car is generally sporadic and they are not established financially. Leading companies such as Zipcar, Enterprise CarShare, and Car2go are already partnering with universities around the world. They have tailored their service to grow the customer base in various ways, from discounts (reduced fees and/or membership) and lowering the age requirement to 18 to locating vehicles close to campuses or at dedicated lots within the campus.

Recognizing universities as a potential customer base, a stream of research is devoted to understanding better students' desires in terms of service characteristics. So far the findings relate mainly to countries/cities with a car sharing tradition. The object of this paper is to shed light on how students feel about car sharing in a region where this mobility option is still underdeveloped. The research approach of the present paper is based on a survey conducted at the University of Belgrade. Students were asked to state their preferences regarding a mixture of attributes and levels replicating how the service is designed in current practice. Most existing research on user preferences uses survey data to predict demand for the service. Our work diverges conceptually in two ways. First, it focuses on identifying different customer segments instead of defining probable users. Second, it derives clusters based on similarity of customer preferences rather than, for example, being structured a priori by socio-economic characteristics. Clusters characterised in terms of service requirements can give operators signposts as to where to start when entering the market. The paper uses stated preference modelling as an input for market segmentation.

This research contributes to the existing knowledge on preferences and adoption of car sharing as follows:

- It focuses on trade-offs between service attributes, which have been relatively disregarded so far. It estimates attribute utilities in a realistic manner by simulating a full-profile service.
- It articulates distinctive clusters of users based on their preferences for service attributes. Insight into the preference-based homogeneity of prospective users is more valuable when defining marketing strategies and service design than the prevailing research method in the field of car sharing of a priori clustering according to socio-demographic and economic variables. The latter, traditional approach to market segmentation is based on a presumed causal relationship between these variables and service preferences that is not necessarily traceable.
- It advances knowledge on how to structure users′ prior expectations using conjoint and cluster analysis and delivers insights from one of the many markets where car sharing is yet to be developed.

The rest of the paper proceeds as follows. The next section presents previous studies on car sharing in a university setting and outlines research questions of this paper. Section 3 is organized in three parts. The first presents the methods used to elicit and structure students' preferences and describes the sample and survey design. The research results are presented in Section 4. Section 5 discusses the results and their practical implications, limitations, and future prospects, and compares them with previous findings. Concluding remarks are given in Section 6.

Background and the scope of the study

A number of academic papers address universities as a car sharing market (Zheng/Scott/ Rodriguez/Sierzchula/Platz/Guo/Adams 2009; Zhou/Kockelman 2011; Stasko/Buck/Gao 2013; Efthymiou/Antoniou/Waddell 2013; Zhou 2014; Le Vine/Adamou/Polak 2014; Breitner/Klein 2014; Danielis/Rotaris/Rusich/ Valeri 2015; Lerro 2015; Paundra/Rook/van Dalen/Ketter 2017; Guirao/Ampudia/Molina/Garcia-Valdecasas 2018). Studies dealing with car-sharing adoption factors relate best to our study and are listed below.

Zheng et al. (2009) use information on service-related user preferences to predict willingness to join the car-sharing programme at the University of Wisconsin–Madison. Zhou and Kockelman (2011) explore the influence of pricing plans and prior car-sharing experience on the adoption rate at the University of Texas–Austin. Breitner and Klein (2014) conduct a survey among students from Leibniz University in Hannover to learn about their willingness to pay for different trip scenarios. Danielis et al. (2015) investigate potential demand at the University of Trieste, analysing the impact of service design and user characteristics in terms of knowledge about car sharing and environmental consciousness. Also in Italy, Lerro (2015) investigates travel habits, behaviours, and attitudes at the Polytechnic University of Turin to reveal primary motivations for and expectations of car sharing. Paundra et al. (2017) examine the affinity for car sharing among Dutch undergraduate university students by coupling the effects of service attributes with attitudes toward car ownership. A recent study of the increase in the number of car-share users among university students in Madrid evaluates the influence of residence location, private car disposal, and service characteristics (Guirao et al. 2018).

To summarize, these studies combine preferences for service-related elements with contextual factors such as users' socio-economic characteristics, alternative modes of travel, trip characteristics, etc., to gain insight into students′ behaviour and predict demand. Typically, information on desired service attributes is collected from car-share members or early adopters in areas where car sharing is already in place.

There is much less feedback on service requirements from non-users, especially in markets where car sharing is underdeveloped. Only a few studies provide detailed evidence on users' prior expectations and preferences regarding specific attributes of car sharing services. Abraham (2000), Koch (2001), and the recent paper by Yoon, Cherry, and Jones (2017) are examples of ex ante analysis of the early stages of car-sharing development. Zheng et al. (2009), Zhou and Kockelman (2011), Lerro (2015), and Guirao et al. (2018) document how potential users judge service attributes in a university environment. Their results mainly deal with the importance of single attributes, or appraise the likelihood of people becoming users. However, none of the previous studies use stated preference data to structure potential customers according to the service features they perceive as most important. Demand projections are far more elusive in the car-sharing market's 'inauguration' phase that we are studying than they are in mature markets, and therefore we focus more on user profiles. To structure user preferences we employ discrete choice experiments and clustering methodology, which is addressed in the section 3.

The added value of our approach is in ability to gain an accurate perception and deeper understanding of user segments, released from ambivalent presumptions on underlying socio-economic conditions. We offer a way to shift from main stream 'a priori clustering' of users, in favour of tracking their preference-based homogeneity. This approach is of help to car sharing companies in their efforts to accommodate specificities of emerging markets into service and business models.

Our study raises several research questions. The first concerns the relationship between the service requirements of students in emerging car-sharing markets and in mature markets. Can the experience in mature markets be replicated, and if so to what extent? If it can be replicated, operators in emerging markets will have a so-called latecomers' advantage. The second question regards the influence of service price. Past field research has shown that the price of the service is the main concern of students in emerging markets, but are there other service attributes that may be subject to trade-offs? Our identification of distinctive preference constructs has implications not only for marketing and managerial activities but also for business operators' running decisions. In addition, we challenge the common assumption that there is a relationship between socio-demographic and travel characteristics on the one hand and user preferences on the other.

The analysis concept

Method

A stated preference survey combined with discrete choice modelling is a suitable tool for examining the behaviour of people with no or little prior experience of car sharing (Efthymiou et al. 2013; Jorge/Coreira 2013). Stated preference

discrete choice modelling (SPDCM) reveals how users value car-sharing service attributes by asking them to rank or rate a set of alternatives (contingent ranking) or choose the preferred option from a choice set (discrete choice experiments (DCE) or choice-based conjoint analysis (CBC)). Discrete choice experiments give the user a set of alternative profiles in the form of choice questions, each profile being described by a different mix of attribute levels. As discussed in Hildebrandt et al. (2015), the important feature of choice experiments is that they address hypothetical service attributes with reduced cognitive load and respondents do not have to select unacceptable alternatives.

Some first attempts to elicit car-sharing preferences on the basis of stated preference and choice experiments can be found in Johnson, Herrmann, and Huber (1998) and Abraham (2000). Several later studies focus on particular car-sharing characteristics such as information systems (Hildebrandt et al. 2015) or electric vehicles (Kramer/Hoffmann/Kuttler/Hendzlik 2014; Zoepf/ Keith 2016; Carteni/ Cascetta/de Luca 2016; Yoon et al. 2017). Some studies exploit stated preference surveys with choice modelling to address mid-term (Efthymiou/Antoniou 2016; Kim/Rasouli/Timmermans 2017 a) and short-term (Kim/Rasouli/Timmermans 2017 b) car-sharing-related decisions.

In this study we used stated preference data and choice-based conjoint analysis to explore preferences regarding a set of attributes. The results were further scrutinized using descriptive and multivariate statistical methods. First, outliers were removed from the analysis using multivariate outlier detection based on Mahalanobis distance (Ben-Gal 2005; Tabachnick/Fidell 2007; Jayakumar/ Thomas 2013). Then, based on their preferences, users were segmented using non-hierarchical cluster analysis, the Partitioning Around Medoids (PAM) method. PAM is an implementation of the K-medoids algorithm, meaning that the centre of each cluster/segment is the medoid (the representative entity/ respondent/consumer). The algorithm partitions the observations in clusters and minimizes the distance between the observations assigned to a particular cluster and its centre (Kaufman/Rousseeuw 1990; Van der Laan/Pollard/Bryan 2003). PAM has several favourable properties. It enables in-depth analysis of obtained clusters/segments by determining the medoid of each cluster/segment. This feature has proved to be of great value when performing user segmentation (Iaquinta/Torsello 2017; Qian/Yang/Li/ Li 2018). For data input, obtaining user preferences via the conjoint method is a viable option (Deal 2013). One of the advantages of the PAM method is the silhouette plot (Rousseeuw 1987), which shows how well cluster members are positioned within their respective clusters (Otoiu/ Titan/Dumitrescu 2014). Besides calculating the predefined number of clusters, it is possible to use the silhouette average widths to assess the best number of clusters. In addition to the silhouette score we also employed the Calinski–Harabasz index (Caliński/Harabasz 1974) as one of the most frequently used

method for assessing the best number of clusters/market segments (France/Ghose 2018; Morton 2018; Silvestr/Cirilli/Zecchini/Muleo/Ruggieri 2018).

Sample structure

The convenience sample comprised students from three different faculties of Belgrade University (Faculty of Organisational Sciences, Faculty of Economics, and Faculty of Transport and Traffic Engineering). Undergraduates were asked to fill in the survey in the week of 15–22 October 2017, their participation being rewarded with additional course credits.

The sample was 41.9 % male and 52 % of the sample had graduated from high school in Belgrade. Nearly half of the respondents (49.6 %) were living with their parents and 49.7 % used more than one bus/tram to travel to the faculty. They did not tend to use taxi services (83.4 % used them rarely or never). Only 31.1 % were familiar with car share services, only 1 % had actually used a car share, while 7.4 % had a friend/acquaintance who had used a car share service.

Survey design

The approach to the survey construction was two-fold. First, we composed a questionnaire to assist us in making a selection from the initial list of potentially influential attributes. Attributes have to be simultaneously considered in conjoint analysis, and it is recommended that their number be reduced so that the respondent can process all of them effectively (a similar approach was taken by Lebeau/Van Mierlo/Lebeau/Mairesse/Macharis 2012, and Hackbarth/Madlener 2013). After the attributes were chosen and their levels defined, the conjoint analysis was performed.

The composition of the pre-test survey comprised three parts. As car sharing is still in its infancy in Belgrade we felt that the respondents should first be introduced to the concept, so at the beginning of the questionnaire, students were informed about the basic principles. The next section contained questions regarding the respondents' travel behaviour (usage of public transport, taxis, personal cars), some demographic questions (gender, place of residence, etc.), and their familiarity with car sharing. The final section presented the survey participants with a list of attributes related to various aspects of service delivery, selected on the basis of how the leading companies (DriveNow, Car2go, Autolib, Zipcar) operate in the market. These included the vehicle fleet (size, age, brands, cleaning), the reservation and payment system, vehicle accessibility, parking spots, and user benefits (see Table 1). The focus was on free-floating service as a more flexible and attractive rental concept. Respondents were asked to specify the four attributes they perceived as most important. At this point in the research, service price was not explicitly included because its significance was presumed.

Table 1: Ranking of attributes in the preliminary test

Attribute	Percentage of respondents	Rank
Distance to vehicle	59.57	1
Vehicle cleanliness	58.16	2
Number of spots to park the vehicle during or after use	55.32	3
Pricing scheme	53.52	4
Information about current availability of parking spaces (e. g., via mobile phone application)	51.77	5
Annual membership fee	48.59	6
Possibility of booking a vehicle in advance (e. g., for more hours or for more days)	46.48	7
Possibility of cancelling vehicle reservation free of charge	43.97	8
Payment options (mobile phone, payment card, etc.)	39.72	9
Size of the operating zone (where vehicle can be accessed and left)	37.59	10
Benefits for regular users (reward points, booking priority, etc.)	34.04	11
Age of the fleet	30.28	12
Vehicle size	17.61	13
Obligation to define the renting period in advance	12.77	14
Vehicle brand	12.68	15

The selected attributes were put into a choice-based survey/conjoint experiment. Each attribute was made up of levels, specified to correspond to levels of service either in car-sharing practice or based on previous research (Table 2). For example, based on empirical evidence, acceptable walking distance to a vehicle was established as 800 m (Schmöller/Weikl/Muller/Bogenberger 2015; Csonka/Csiszár 2016). Since predictive performance of CBC gets worse with higher numbers of attributes and attribute levels (Hein/Kurz/Steiner 2019), we did not create a large number of levels per attribute. Most attributes had two levels, except 'Renting rate', which purposely had three levels as we assumed that students would be sensitive to cost.

Table 2: Attributes and levels

Attribute		Levels
A.	Pricing scheme	A1. By-the-minute rate A2. Hourly rate only
B.	Cleanliness	B1. Vehicles are cleaned and washed daily B2. Vehicles are cleaned and washed twice a week

Attribute		Levels
C.	Distance to vehicle	C1. Up to 400 m C2. Up to 800 m
D.	Renting rate	D1. 1200 RSD per hour D2. 1400 RSD per hour D3. 1600 RSD per hour
E.	Parking spots	E1. Free of charge in any approved legal spot E2. Free of charge in any approved legal spot plus in the reserved/dedicated locations of the company.

The survey was carried out using the choice-based conjoint online platform Conjoint.ly (Samoylov/Kayande 2017). Respondents were repeatedly asked to choose one of three car-sharing options (encompassing previously stated attributes).

Research results

From the pre-test survey we were able to generate the most important car sharing attributes based on how frequently they were selected. These were distance to vehicle, pricing scheme, parking spots, and vehicle cleanliness (Table 1). Together with rental rate they formed the input for the choice-based conjoint (CBC) experiments.

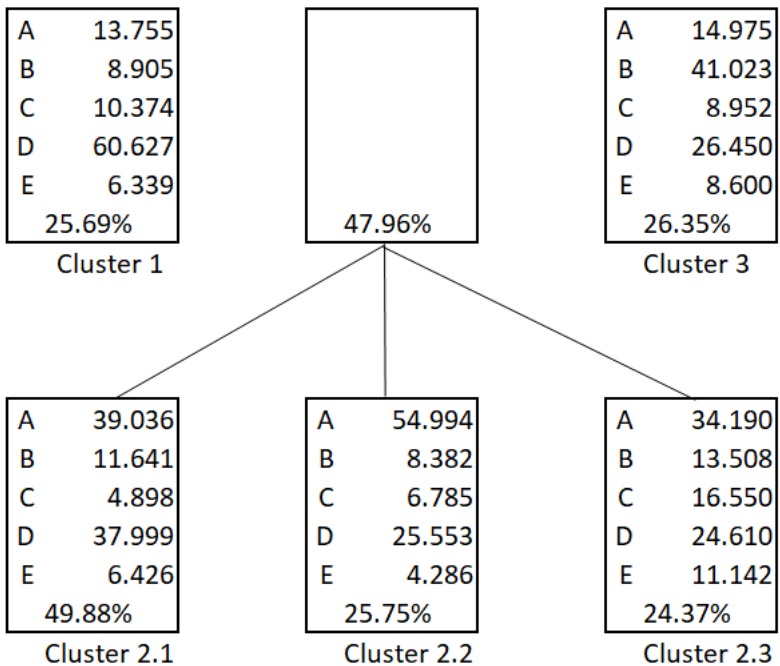
In total, 954 fully answered responses were collected. Of that number, 36 respondents were excluded from the analysis because CBC determined inconsistency in their responses and an additional 11 respondents were excluded because they were classified as outliers, giving a final dataset of 907 respondents.

With the principle objective of revealing and structuring user preferences, we further analysed the attribute importance scores by clustering the sample respondents into several market segments. Both the silhouette score and the Calinski-Harabasz index proposed three clusters, as depicted in Figure 1.

In the first cluster, *StudentsOnABudget*, with 25.69 % of respondents, the attribute 'Renting rate' had the highest score (60.627), meaning that for them this was the most important aspect of car-share service. On the other hand, in the third cluster, *CleannessComesFirst*, with 26.35 % of respondents, the attribute 'Cleanliness' had the highest score (41.023). The second cluster, not only because of its size (47.96 % of sample) but also because it exhibited a variety of individuals' preferences, lead to a further clustering approach. Both the silhouette score and the Calinski-Harabasz index determined three sub-clusters, with Cluster 2.1 and Cluster 2.2 being more cost-oriented (attributes 'Pricing scheme'

and 'Rental rate') while Cluster 2.3 encompassed cost and other attributes, which we named 'amenity-oriented'.

Figure 1: Segmentation of the respondents based on their car sharing preferences



As we can see from Table 3, cost-oriented attributes dominate our sample, with only Cluster 3 representing students who prefer amenities over cost in car-sharing services.

Table 3: Cost vs. Amenity clusters

Group of attributes	Cluster1	Cluster2.1	Cluster2.2	Cluster2.3	Cluster3
Cost-oriented (A+D)	74.382	77.035	80.547	58.800	41.425
Amenity-oriented (B+C+E)	25.618	22.965	19.453	41.200	58.575

Discussion

Key findings

The study distinguished two user groups among Belgrade students. The first and unsurprisingly dominant group comprised those whose participation in car sharing would depend heavily on purchasing cost. However, the second group expressed an almost equal interest in price and amenity-oriented attributes. When

comparing our results with similar studies, the first impression is that students in an emerging car-share market have a lot in common with their counterparts in more-developed markets: they share the same concerns regarding high costs and vehicle accessibility.

As the student population heavily relies on public transport, often with subsidized travel, it is not surprising that they are generally very sensitive to car-sharing rental rates. Less expected was their strong homogeneity with regard to the importance of vehicle access. Our study shows a low tolerance of walking distance, thus matching previous findings where this attribute ranked equal to rental rates (Zheng et al. 2009; Zhou and Kockelman 2011; Danielis et al. 2015, Guirao et al. 2018). It seems that students from many parts of the world are either unwilling to walk very far or unwilling to spend time reaching the vehicle. In addition to these features, parking convenience has also been found to be of great importance (Lerro 2015, Paundra et al. 2017), and the same is found for the emerging market in our study.

The clusters we have obtained suggest that a large fraction of cost-oriented respondents (Clusters 2.1. and 2.2) prefer not only low rates but also a more flexible, per-minute payment system. Although the pricing scheme is an issue of interest (see for example Perboli/Ferrero/ Musso/Vesco 2018), it has not yet been addressed in a university environment. A possible explanation for this is that pricing scheme has not been subject to testing as it is already part of the business model.

A rather unexpected finding is the relevance of keeping vehicles clean, which was detected after the preliminary test and confirmed through conjoint and cluster analysis. Although considered in previous research (Sopjani 2015), cleanliness is usually not considered to be a critical aspect. The respectable proportion of respondents (Cluster 3) who expressed high interest in this attribute reflects the peculiarity of the market in our study, which needs to be accounted for.

Additionally, we analysed clusters in terms of socio-demographic and travel characteristics. Chi-square test results indicated that there were no significant differences between clusters. Each cluster was evenly distributed between males and females and between those who were renting/living in a dorm and those living with parents. A majority of the members of each cluster had a driving license but hardly ever drove a car. Regardless of the cluster membership, public transport was by far the most-used travel option, while taxis were rarely used. The only significant finding refers to public transport use. Fisher's Exact Test ($p<0.05$) revealed that most of those using more than one bus/tram to reach the faculty fell into Cluster 3. Their willingness to pay more for a more convenient travel option can perhaps be explained by the lack of comfort posed by this kind of public transport use.

Practical implications

In order to understand the practical contribution of our study, two car-sharing specificities should be emphasized. First, as a service business, car sharing is not necessarily straightforwardly profit-oriented, but can be established for strategic reasons. Major international car-sharing operators are owned or co-owned by car manufacturers who use this business to promote car brands. Public transport operators, interested in enhancing first/last mile connections, may also become parent companies or car-sharing shareholders. Where the price of the service has such a dominant impact, as found in our study, it is more likely that big players with strategic interests will unlock the market. Self-reliant start-up companies that need large investments will be more dependent on rental rates, and will probably have less chance of becoming viable businesses. The second specificity is the diversity of car-sharing business practices. Although there are distinctive theoretical business models with associated features (for the typology see, for example, Münzel/Boon/Frenken/Vaskelainen 2018; Remane/Nickerson/Hanelt/Tesch/Kolbe 2016), in practice the lines are blurred. There is a wide variety of service design and it is not uncommon for the same international company to operate in quite different ways in different cities. The current state of play in developing markets is that operators do not simply transfer existing business practice but very much strive to adapt to the local context (WRI 2015). In this respect, the division of user preferences into distinct customer segments is a first indicator of how future car-sharing businesses could establish operational priorities. Even though priorities are partly a matter of own-organization capability, current practice shows that partnership with municipalities and/or other stakeholders can be crucial for business.

The outcomes of our study show that there are several issues that entrants into undeveloped car-sharing markets should work on. Because of the substantial proportion of amenity-oriented customers, it would be advisable to start with the size, placement, and maintenance of the vehicle fleet. More designated parking places would address both the preference for reserved parking spots and the preference for better vehicle access. To achieve this, managerial activities should include negotiation with local authorities, universities, and dormitories. Management should also engage with fleet allocation to ensure a balanced distribution of vehicles. Regarding the importance of maintaining cleanliness, marketing strategies can be utilized to encourage the return of clean vehicles. The dominance of cost-oriented clusters indicates that renting rates can be a decisive factor for customers must be taken into account. The ‘pay as you drive’ principle would address the needs of Clusters 2.1 and 2.2 where the pricing scheme is important, and could possibly be traded off against higher rates. It seems unlikely that a single type of service will match the requirements of all target segments. Hence, car-sharing providers should consider more service packages and try to compromise between service attributes in a way that corresponds to the obtained

preference structures. It should be noted that the results would be more reliable if prior to the survey the students had been given the opportunity to try car sharing (using, for example, gift cards for students, as in the study of Zhou 2012).

Limitations and future prospects

During our research we have identified limitations, some of which could be the subject of future work. Understanding user preferences regarding service attributes before implementing them would certainly be beneficial to operators. However, hypothetical interpretations may hinder other meaningful explanations, specifically regarding credible translation of preferences into behavioural patterns, which might differ from the preferences stated in the survey (Godelnik 2017). Surveys with repeated measures might remedy the issue and track changes in student behaviour (Klemenčič/Chirikov 2015). Furthermore, issues with surveys such as a rising trend of nonresponse rate (Meyer/Mok/Sullivan 2015) or survey fatigue (Van Mol 2017), represent an additional challenge. There is also a so-called 'status quo bias', as pointed out by Krueger et al. (2016), resulting not only from the hypothetical nature of the problem but also from the fact that attitudes may change by the time the service appears on the market.

Another drawback of the study stems from methodological constraints. One of the limitations of conjoint analysis is that the attribute levels must be discrete (Arora 2006). Also, conjoint experiments are carried out with a limited number of attributes that can be handled by respondents (Bakken/Frazier 2006; Njite/ Schaffer 2017). When it is difficult to select the most important service attributes this might be a problem and lead to the possibility that some attributes are omitted from the analysis (Lee/Won 2011). For instance, in our study a line had to be drawn between 'Pricing scheme' and 'Parking information'. Future directions of study might include different approaches to the process of CBC attribute selection, such as expert panels (De Brún/Flynn/Ternent/Price/Rodgers/ Ford.../Thomson 2018), the Delphi method (Muller/Holland/ Kay/Hytten 2018), one-on-one, in-depth interviews (Alberini/Riganti/Longo 2003; Mehta/Bhanja 2018), focus groups (Mathijssen/van Heuckelum/van Dijk/Vervloet/Zonnenberg/ Vrijezekolk/van den Bemt 2018; König/Bonus/Grippenkoven 2018; Ng-Mak/ Poon/Roberts/ Kleinman/Revicki/Rajagopalan 2018) or structural equation modelling (SEM) (Kubota/Sawano/Kono 2017). Integrating SEM into results obtained using conjoint and cluster analyses (Head/Ziolkowski 2012) also represents an interesting future direction of study.

The final question of interest relates to the sample composition. At that point in our research we were only able to reach undergraduate students. However, it would be of interest to observe the opinions and attitudes of postgraduate students as well. Although in Belgrade they comprise a minority of the general stu-

dent population, some postgraduates are employed, which means that they reflect the habits of both students and those in work.

Conclusions

Our article expands existing knowledge on car-sharing-service adoption, focusing on young people, who are of interest because they are used to new technologies and arrive with their own expectations. Besides illuminating students' car-sharing preferences, our work also provides impetus for similar research among other user groups. The value of our research is multifaceted. Theoretically, the study proposes distinctive customer clusters in respect to stated preference data. In so doing we combine discrete choice modelling with non-hierarchical cluster analysis, which enables us to shape user preferences. This framework can be applied to the initiation phase of many other service-oriented businesses. The study's practical contribution is that it delivers findings for cities where there is a noticeable lack of research on this topic. The user preferences structure should help future car-sharing organizations when configuring services and deciding on marketing activities.

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