

IT'S ALL ABOUT THE PRICE TAG EXPLORATIVE EVIDENCE OF ADOPTION OF MULTIMODAL MOBILITY PACKAGES FROM A CHOISE-BASED CONJOINT STUDY IN AUSTRIA

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Overview

Electrification, automatization, connectivity and sharing represent the major trends in the transport sector (European Commission, 2019), which is the greatest contributor to climate change with almost a quarter of all global energy-related greenhouse gas (GHG) emissions (IEA, 2016a, 2016b). Despite all the attention and measures regarding clean technologies, e.g. electric vehicles (EVs), the current transport system is still inefficient and unsustainable as private cars are still the core of day-to-day mobility. One promising concept promoting more sustainable transport behaviour is Mobility-as-a-Service (MaaS). Till now, numerous MaaS-related pilot programs have been implemented across Europe and beyond. So far, most of the work has been done by practitioners and there is still lack of scientific research, especially regarding the configuration of multimodal mobility packages. Building on the work by Matyas and Kamargianni (2018) we conducted a choice-based conjoint experiment representative for Austrian citizens (N = 590). The aim of the present study is to investigate the effect of different attributes of multimodal mobility bundles/packages on purchase intention. Our key findings can be summarized as follows: the most important attribute is price (monthly payment), followed by transport modes (transport modes that are included in the package), transfer time (between the different transport modes on a trip) and reachability (of the first transport mode). The last two attributes (transferability and allotment expiration) seem to be "nice-to-have", rather than "must-have". Attribute preference, however, varies among different segments of potential customers, underlining the need for individualisation and customised packages. We discuss implications of our findings for future research as well as practitioners and policymakers.

Methods

The present study follows a two-step methodological approach: qualitative interviews and a questionnaire including a conjoint experiment. First, after a thorough literature review, a dozen of qualitative interviews with experts from different fields (e.g. academia, public transport, firms active in the MaaS sector etc.) and potential customers were conducted from November 2018 to February 2019 in order to gather insights on current MaaS initiatives and offerings as well as criteria and preferences related to the decision to use multimodal mobility packages. This was the basis for the development of the questionnaire and the conjoint experiment. We conducted an online survey with Austrian citizens (N = 590; 18-70 years) in order to identify preferences related to features of multimodal mobility packages and the respondents' willingness to pay (WTP). The data was collected during May and June 2019. The first part of this survey included questions to evaluate respondents' travel preferences and behaviour. The second part included the conjoint experiment. Choice-Based Conjoint (CBC) is a well-established research method to study decision-making processes and criteria (Green & Srinivasan, 1978, 1990). The conjoint study conducted included 12 choice tasks, which is a common practice in other conjoint studies (e.g. Hampl and Loock, 2013; Kubli et al., 2018). Each choice task comprised three options of hypothetical multimodal mobility packages, which are described along six pre-defined attributes. Each of the attributes consisted of four to five levels. Furthermore, a "none option" (if the respondent would not prefer any of the presented options) was included as a fourth option to better reflect real purchase behaviour. Sawtooth Software products were used for both the questionnaire design and setup as well as the statistical analysis of the choice data. In contrast to a traditional mixed-logit model, where only aggregated data is included, we applied a hierarchical Bayes (HB) model where individual part-worth

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utilities can be estimated (Rossi & Allenby, 2003; Huber & Train, 2001). Besides HB for the analysis of the conjoint data we used latent class analysis (LCA) to identify different segments among the respondents (Sawtooth Software, 2004).

Results

Related to the relative importance of the attributes in our conjoint experiment (e.g. transport modes, transfer time, reachability, transferability, allotment expiration and price (per month)) we can report the following results. As assumed, price was the most important attribute with 39.51%. The attributes transport modes (18.63%), transfer time (12.43%) and reachability (12.16%) had a similar relative importance score. Finally, transferability (8.44%) and allotment expiration (8.44%) seem to play only a minor role in the purchase decision and can be seen more as “nice-to-have” services of the mobility package. The results of the HB analysis revealed that potential users of mobility packages most prefer lower prices (on a monthly basis), packages that include all offered transport modes (public transport (PT) + bike sharing + car sharing), a maximum waiting or transfer time between the different transport modes on a trip of 5 minutes and a maximum distance to the first transport mode of 200 meters. Another benefit of the conjoint analysis is the possibility to convert part-worth utilities into aggregated monetary WTP scores (Green & Srinivansa, 1990). In the present study, WTP relative to a default option (i.e. PT + bike sharing, 25 min, 1000 m (approx. 15 min), non-transferable package and unused allotment expires monthly) was calculated. Finally, in order to identify heterogeneity in user preferences regarding the mobility packages we conducted an LCA. We chose a 3-group solution: convenience adopters, price-sensitive adopters and likely non-adopters. Based on the preferences for the mobility packages the findings indicate that two of the three customer segments are potential adopters. The third segment with the part-worth utility of the none option as the highest score was labelled as likely non-adopters.

Conclusions

Multiple trends like urbanization, digitalization, demographic and societal changes as well as increased awareness of environmental issues are drivers that transform the mobility sector (Hoppe et al., 2009). Further, shifting norms and attitudes towards transportation change how people travel. Especially the younger generation – the millennials – own fewer cars, drive less and are less likely to own a driver’s license compared to older generations (Klein & Smart, 2017; Kuhnimhof et al., 2011; Raimond & Milthorpe, 2010; Sivak & Schoettle, 2011, 2012). Combining this with the fact that the average car is parked 92% of the time so that its capacity is not nearly optimally used (MacArthur et al., 2015) it becomes evident that new business models such as MaaS are in demand (Ambrosino et al., 2016). In recent years, a growing body of literature has shown interest in the MaaS concept, especially in the context of services and technological developments (Kamargianni et al., 2016; Jittrapirom, Caiati, Feneri, Ebrahimigharehbaghi, Gonzalez & Narayan, 2017). Consequently, to promote the diffusion of such mobility packages the preferences and characteristics of future users are of high relevance. The present study shows that the most important feature of such offerings is price, followed by the transport modes included in the package, transfer time and reachability. Furthermore, our findings from latent class analysis reveal that the preferences for package features differ between different groups of potential users underlining the need for individualisation and customisation. These findings represent important insights for marketers and policymakers to better identify and understand potential adopters of multimodal mobility packages. Considering the high impact of the transportation sector on climate change further research is of high relevance. Thus, the implementation and evaluation of MaaS concepts will shape future of mobility discourse and the further development of mobility services.