ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Bachelor's Thesis (Marketing)

Segmentation of O2O taxi platform users as the mobility industry changes

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Executive Summary

The mobility industry is changing rapidly. As a result, Hyundai Motor Group and Volkswagen have decided to invest in the mobility services of the future. However, since the industry has changed beyond recognition, there is a limited number of current research on consumers and market segmentation. To fill this gap, this thesis begins by providing an overview of the ride-hailing industry. Then, segmentation theory is used to discover the deficiencies of app-based ride-hailing and taxi services. Further, the previous research indicates that the majority of consumers in the sector are young (Soltani et al, 2021). Thus, the thesis focuses on the global youth. Interviews and surveys were conducted in order to discover key attributes and to find what is important for customers of the ride-hailing industry. The results are subjected to clustering analysis and conjoint analysis.

The most important factor for young consumers when looking for transport is, not surprisingly, price. The interviews indicated that many prefer public transportation because it is cheap and convenient. Starting from this important limitation, the survey has identified what this group is looking for when their first choice is not used. The study has found the main reasons for using app-based ride-hailing and taxi services. Convenience and superior transit options emerged as the most popular attributes. The results of the survey were also segmented based on survey results, exhibiting different ride-hailing requirements.

With many variables in the research, the thesis clusters the samples with the variables, specifically, reasons and attributes. In order to see the segmentations in detail, the clustered variables were examined and the results indicated that the reasons vary depending on the alternative transit options, economic considerations, and weathers. The attributes vary based on the conveniences, matching time, and prices.

Group 1 uses a ride-hailing service because it is quicker and cheaper. Group 2 uses transportation services when the travel distance exceeds 6 km. Since they travel over longer distances, they typically install three ride-hailing applications on their smartphones. Remarkably, 38% of the respondents, who are non-user of ride-hailing services, are

classified in Group 3. Group 4 respondents only used the services in question when alternatives were unavailable.

Since the surveys are mainly from the Netherlands and South Korea, the thesis further discusses the key consumer characteristics in these countries. The findings are as follows: mainly the consumers in the Netherlands use ride-hailing services when there are no alternative options and have a tendency to look for cheaper options relatively higher than their consumers in South Korea. However, South Korean consumers prefer to have a comfort relatively higher compared to those in the Netherlands.

Several marketing strategies are suggested on the basis of the findings. In comparison to Uber's current segmentation, Uber X can target all four groups. However, a specific strategy to promote the novel form of segmentation must be adopted. They must obtain more customer data. Strong pricing promotions, such as ridesharing options, are necessary to attract Group 3 consumers. Furthermore, 38% of consumers are identified in this research as not active users in the industry - signifying that there are rooms for new entrants to enter this market. Moreover, different promotion plans are needed based on the countries. For consumers in the Netherlands, on-time promotion plans for the cancellation of public transportation, and the weather conditions are needed. For consumers in South Korea, improving convenience while having price competencies will increase the overall competencies in the market.

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Chapter 1 Introduction

1.1 Origin of the study

Sales in the automotive industry have plateaued. Accordingly, manufacturers are seeking new opportunities and means to transition to new business models (Goodwin & Van Dender, 2013). Hyundai Motor Group are currently preparing to launch smart mobility devices and services by 2025 (Hyundai Motor Group, 2019). In China, the FAW Group and Volkswagen have set up a subsidiary for mobility services (Gasgoo, 2021). Likewise, a rapid shift is occurring in the mobility industry. However, the transition is not instantaneous. In 2018, Tilleman claimed that manufacturers may adopt alternative business models, such as mobility services, to replace car sales (Tillman, 2018). Ride-hailing has already shaped mobility by introducing on-demand transportation (Automotive World, 2021). Although rapid changes are unfolding, a meaningful search for clues about the future of ride-hailing services is still feasible.

Competition in the ride-hailing market is becoming more intensive. In 2012, Uber internationalized its services and started to offer its services globally. Uber excel in offering conveniences, with features such as single-tap rides, reliable pickups, clear pricing, cashless payments, and feedback. There is a tendency to Uberification in the market, that is, many companies have emerged that offer services that are similar to those of Uber (Khurana, 2019). Uberification has several key characteristics: a set list of providers, a standardized user experience, and local proximity (Khurana, 2019). Uberification has led to new businesses of similar services to enter the market. In result, ride-hailing services became more competitive in several countries. For example, Yandex have launched similar services in Russia (Reuters, 2018), and Kakao have done the same in South Korea (Herald, 2017).

Competition is intensifying. Therefore, it is important to understand consumers in order to design effective marketing strategies. Accordingly, the research aims to understand the consumer base of the ride-hailing service industry.

1.2 Purpose of the study

The thesis focuses on key consumer attributes in the ride-hailing market so as to describe the target consumer groups. To this end, the thesis examines current mobility platform services and their consumer bases. In brief, the thesis has two goals: to understand consumers and to identify target consumer groups in the ride-hailing market.

1.3 The ride-hailing industry and the knowledge gap

The ride-hailing industry is growing increasingly competitive. The extant research often compares ride-hailing services to conventional taxis on dimensions such as convenience, ease of use, and geographic coverage (Kim & Lee, 2018; Dredge & Gyimóthy 2015; Wallsten, 2015). However, there are important differences. Notably, ride-hailing services are cheaper than traditional taxis. Such has been the growth of the market that, in 2025, ride-hailing services are projected to compound growth annual of 17.5% all travel market globally. Still, scholars compare ride-hailing consumers with those who use other forms of transportation. Given the growth trajectory of the industry, the time is ripe to examine the underlying segments in detail.

Ride-hailing services are always open to adopting new technological solutions, including the use of data. In other online-to-offline (O2O) industries, it is a trite proposition that dynamic pricing improves profitability. In the study of Tong et al.(2020), the wide use of dynamic pricing strategy is identified in Chinese O2O food platform sector. Similarly, In 2020, Kakao Mobility decided to use data to change prices dynamically (Kakao Mobility, 2020). The resultant model calculates on-demand prices that reflect considerations of time and range (Kakao Mobility, 2020). With this said, current promotions are seldom based on pricing. Market segmentation can drive the development of promotion strategies.

In summary, a clear understanding of the consumer base can benefit the ride-hailing industry in two important ways. Firstly, given the recent emergence of the industry, previous research have sought to understand its consumers as a whole. However, it is time to segment that group into sub-groups: as noted, it already accounts for 20% of U.S. travel.

Secondly, a sound analysis of the consumer base is necessary to devise strategies such as dynamic pricing models. Therefore, this research attempts to segment the market into consumer groups. The following research question drives the research:

Given the current state of the mobility industry, how can ride-hailing consumers be segmented and targeted?

Several sub-questions were also formulated. They are discussed length in Chapter 2, which reviews the literature, and in Chapter 5, which contains the conclusions and the recommendations that emerge from the findings.

- What do ride-hailing services entail?
- What are the key characteristics of their consumers?
- What is segmentation?
- What kinds of attributes are consumers interested in?
- To what extent are consumers aware of different types of taxi services?
- What drives decisions to use taxi services?
- Is the current market structurally segmented, and is there room for implementation?

1.4 Outline of the research

Chapter 1 describes the purpose of the study and its direction.

Chapter 2 reviews segmentation theory and the literature on ride-hailing services.

Chapter 3 presents the research method and explains the use of quantitative analysis

Chapter 4 discusses the selection of the interviewees and the respondents to the survey.

Chapter 5 discusses the result from the interview and the quantitative analyses.

Chapter 6 concludes. It outlines the research and its limitations, and it adumbrates avenues for future research.

Chapter 2 Literature Review

2.1 Research about segmentation theory

According to Sun, market segmentation was introduced by Wendell R Smith in the 1950s (Sun, 2009). According to Smith, "market segmentation is to divide a market into smaller groups of buyers with distinct needs, characteristics, or behaviors who might require separate products or marketing mixes" (Smith, 1956; Bonoma & Shapior, 1983; Söllner & Rese, 2001; Lamb, 2003; Sun, 2009). For the most part, market segmentation is used by marketers to identify customer needs and to design features accordingly (Sun, 2009). Moreover, market segmentation isolates distinct subsets of customers who behave in the same way or who have similar needs (Bonoma & Shapior, 1983; Söllner & Rese, 2001). According to Claykamp and Massy, market segmentation enables marketers to allocate marketing resources efficiently because separate market segments exhibit variations in elasticity (Claykamp & Massy**,** 1968; Lilien & Kotler, 1983).

Segmentation is a major component of and an essential step in marketing strategy. Its strategic significance for the ride-hailing market derives from two considerations. Firstly, marketing resources are scarce. Secondly, the traditional taxi industry has ceased to grow. Nowadays, consumers use mobility services that offer various options to cater for different needs.

There are several criteria to choose the key variables of segmentation. Kotler divides them into four categories: geographic, demographic, psychological. Follow-up research from Kotler et al. (2002) refers to five categories that have organisational characteristics (Kotler et al., 2002). The implication is that market segmentation standards may vary in the same way as product and service characteristics. Accordingly, various standards may be employed in the context of the mobility industry.

According to Sun (2009), the literature shows that segmentation proceeds in four steps. The first step is to select a market. The second is to choose a segmentation basis. The third is to identify segmentation descriptors, and the fourth step is to profile and analyse

the resultant segments (Lamb & McDaniel, 2003; Sun, 2009). There are many approaches to segmentation, such as cross-classification analysis, automatic interaction detection (AID), regression analysis, and clustering analysis. The need to select a base variable, however, is a point of commonality.

Segmentation entails analysing a market to identify smaller sub-markets. This section attempted to explain why segmentation is necessary in the ride-hailing industry. The next step is to identify the knowledge gaps that hinder segmentation.

2.2 Research about the ride-hailing industry

In order to examine consumer characteristics and analyse market segmentation, it is essential to understand the ride-hailing industry. Uber is the most prominent example. It is an online ride-hailing application. It is attractive because of its flexibility, ease of use, and transparency (Dredge & Gyimóthy 2015; Wallsten, 2015). Although ride-hailing services share some key characteristics with traditional taxis, there are a few differences. According to Kim and Lee (2018), who studied a similar service called Kakao, the users of ride-hailing services focus on the convenience of setting up pick-ups and drop-off locations, the trustworthiness of the driver, and the availability of real-time updates on driver's location.

In 2016, Rayle et al. (2016) showed that 67% of consumers used ride-hailing services for leisure, that 16% used them for commuting, that 4% used them to reach airports, and that 5% used them for other purposes. Unlike taxis, ride-hailing services have seen their share of the market to grow continuously and are expected to reach $108.15 billion in 2025 with compound annual growth rate by 17.5% (Research and Markets, 2021). Importantly, in 2017, research by US NHTS found that ride-hailing services are relatively cheaper than all taxis.

Several attempts have been made to understand the consumers of ride-hailing services. A study from 2016 found that those services are used for transit trips (Rayle et al, 2016). Literature reviews on consumer behaviours and their key characteristics will be examined in the following chapter.

2.3 Research about consumer behaviour in the ride-hailing industry

Discovering the key variables for market segmentation necessitates understanding consumer behaviour in the ride-hailing industry. According to Dredge & Gyimothy (2015), the ride-hailing service shares many characteristics with traditional taxi services (Dredge & Gyimóthy 2015; Wallsten, 2015). This section examines previous researches on the characteristics of consumers and segmentation criterion in ride-hailing industry.

In 1981, research was conducted to identify a segmentation rule for the ridesharing sector. That research suggested that identifying the individuals who wish to switch away from personal automobiles is of the essence (Gensch, 1981). The methodology was statistically sound, and it was based on the logit model. However, the research is outdated. Compared to 1981, ridesharing has become cheaper and more convenient. Nowadays, there are more public transportations available in the many cities, enabled by improved information technology. Nowadays, people can easily plan the route with the related technologies such as smartphones and wireless connections. While, older studies can be still useful as their methodologies remain relevant to contemporary problems.

Recent studies on ride-hailing services have sought to identify the reasons for their popularity. Ridesharing emerged in Australia later than it did in North America and Europe (Soltani et al., 2021). Therefore, Australian studies are more recent. Uber X has spread to more than 37 cities, including Adelaide (Soltani et al., 2021). According to the literature, consumers appreciate the efficiency, comfort, and reasonable expense of ride-hailing, especially in comparison to public transportation (Soltani et al., 2021). The typical user is youth, male, received higher education, and employed on a full-time basis (Soltani et al., 2021). Furthermore, the research also identifies smaller groups which are lower-income individuals, parents, and people with disabilities as users of ridesharing services. Usage patterns resemble those observed in the conventional taxi market, but the lower prices attract younger customers (Soltani et al., 2021). In Australia, those who live in urban areas are likely to be accustomed to ride-hailing services (Soltani et al., 2021). However, individuals in rural areas are more likely to walk or bike (Alemi et al., 2019). Soltani et al. (2021) hinted at the possibility of demographic and geographic segmentation. However,

since the industry is changing rapidly, new features are introduced continuously. Therefore, studying the reasons for switching and behavioural segmentation may be more fruitful for developing an understanding of the psychology of the market.

According to Babar and Burch (2017), since Uber entered the market, the use of rail transportation has increased, and the use of buses has decreased. These tendencies were less pronounced in cities with high-quality transit networks. The density of transit stops is correlated to the use of ride-hailing services (Babar & Burch, 2017). Another study argues that the use of ride-hailing service is less frequent in cities with fewer transit options (Brown, 2018). However, according to Soltani et al. (2021), most researches indicate that those who live in more densely populated areas are more likely to be ridesharing users (Sarriera et al., 2017; Alemi et al., 2018; Gerte et al., 2018; Yu and Peng, 2019; Mitra et al., 2019; Brown, 2020; Sabouri et al., 2020; Bansal et al., 2020; Soltani et al, 2021).

There are several findings related to ride-hailing industry. First, regardless of the regions, most of the consumers are young and educated. Secondly, consumers appreciate 'comfortable feature' and 'reasonable prices of the ride-hailing services'. Thirdly, people who live in densely populated areas are more likely to be ridesharing users.

2.4 Knowledge gap between segmentation and its implications for industry

Market segmentation is important for marketing strategy. The previous section examined the key market segmentation theories in order to isolate significant consumer characteristics in the ride-hailing sector. The four steps involve choosing a market, a segmentation basis, and segmentation descriptors as well as profiling and analysing the resultant segments. According to the literature review, the methods that can be used to assess segmentation include cross-classification analysis, AID, regression analysis, and clustering analysis. Kotler identified the key criteria for selecting the variables. If the correct procedure is followed, there should be a clear basis for segmenting the market. However, the key variables in the ride-hailing industry are unknown, and the market faces certain limitations. Accordingly, the following hypotheses were formulated:

H_1: The key attributes of the app-based ride-hailing and taxi industry resemble those of the traditional taxi industry.

The operative assumption is that the market functions well without segmentation. This thesis examines the extent to which the key attributes are affected by the consumer. Accordingly, the following hypothesis was derived:

H_2: The importance of key attributes in the app-based ride-hailing and taxi industry varies based on consumer's willingness to pay

Chapter 3 Research methodology

3.1 Research justification

This research concerns the application of segmentation theory to ride-hailing services. Given the intensification of competitive rivalry in the sector, marketing is growing in importance. In this respect, the research has three obvious benefits. First, it can indicate how marketing theory can be implemented in the ridesharing industry. Secondly, it provides reasoned insights on the consumer base. Finally, it indicates how attributes can be identified in a rapidly changing business environment.

3.2 Research objectives

Since the research focuses primarily on segmentation, it proceeds from segmentation theory. Once that theory has been described, the thesis turns to the specificities of the ride-hailing industry, including consumer characteristics. Therefore, the thesis incorporates various sources of information on ride-hailing and previous research on consumer behaviours.

Interviews are used to verify the findings from the literature review and to discover additional attributes. The literature review and the interviews thus drive the conjoint analysis. The latter circles on younger individuals, and its results refer back to the literature

review and the interviews. Its use in conjunction with qualitative and quantitative techniques enables conclusions to be drawn about the research questions.

3.3 Benefits of interviews

Although the literature on ride-hailing is developed, it is not free of gaps. The previous section of the thesis examined the key characteristics of ride-hailing services, namely ease of use, speed, convenience, and range. However, segmentation can only proceed if the characteristics of specific consumer groups are identified. Previous research does identify the key characteristics, but it does not provide sufficient reasons.

Given the goal of this study, the identification of switching reasons is of paramount importance. Since public research is scarce, the use of qualitative methods seems justified. The thesis focuses on interviews, an effective qualitative study method. Its advantages include the direct participation of the researcher, which yields a higher response rate (Beatly, 1995). Simultaneously, unclear answers can be clarified through follow-up questions (Beatly, 1995). However, interviews take longer to complete than survey (Barriball & While, 1994). Moreover, anonymity cannot be guaranteed, which may cause distortion or subjectivity to intrude into the answers. Despite these disadvantages, interviews are still useful as they improve participation attitude and allow follow-up questions such as to inquire switching reasons.

3.4 Interview design

The interviews were designed with a view to acquire important and relevant information about consumer behaviours in the ride-hailing industry. As mentioned previously, interviews are used to verify the findings from the literature review and to identify additional consumer attributes. It is critical to avoid misrepresentation and bias. For this reason, the length of the interview questions was kept to a minimum, and the conversations were led by the interviewer.

The purpose of the interview is to verify the findings from the literature. According to the literature review, prices, convenience, and travel times matter the most to consumers. Thus, interviews are only focused on the consumer side of the industry. The interviews were also used to identify additional segmentation attributes. The following questions were asked during the interviews:

1. What are the main differences between app-based taxi or ride-hailing services and public transportation?
2. What are the main differences between traditional taxi services and public transportation?
3. Is there any specific reason why you chose the platform?

3.5 Methodology of conjoint analysis

The conjoint analysis was formulated to answer the empirical sub-questions. Conjoint analysis concerns average importance values and the average utility of each attribute. The questions that are examined in this way include “To what extent are consumers aware of different types of taxi services?” and “What drives decisions to use taxi services?”.

Attributes need to be identified clearly for the conjoint analysis to proceed. Using the exploratory results on the ride-hailing industry and O2O platforms, the attributes for the survey questions were selected on clear grounds. Since conjoint analysis can explain the value of the attributes, not their selection, the results complement those from the interviews.

Although several attributes affect the industry, conjoint analysis must be based on three or four to produce adequate results. The interviews were used to achieve this simplification. Furthermore, the characteristics of the survey made it difficult to answer all the questions. Since full factorial designs cannot be implemented in the real world, the survey is designed to minimise choice sets. SPSS suggested that nine choice sets are sufficient for conjoint analysis. Orthogonality can be checked through the orthogonality of

the choice sets. Once the orthogonal choice sets are in place, conjoint analysis yields the benefits of each attribute and identifies the relevant segments. However, conjoint analysis has a limitation. It describes information within the group set, but it does not produce further details about segmentation.

There are several methods to execute a conjoint analysis. The most widely used method is the main effect model, which is based on ordinary least square estimation. In this research, relative importance and average expected utility are calculated through the model presented below.

$$U_i = \beta_0 + \sum_{t=0}^{p_1} \beta_{1t} X_{1t_i} + \ldots + \sum_{t=0}^{p_a} \beta_{at} X_{at_i} + \varepsilon_i$$

$$(P_j = 2, i = 1, \ldots, n, j = 1,2,..,a)\ ,$$

$$U_i : average\ utility;$$

$$\beta_0 : constant\ term;$$

$$X_{1t} : indicate\ attribute;$$

$$\varepsilon_i : error\ term,$$

Equation 1: Models for estimating average utility of key attributes

where a is number of attributes and n is number of profiles. $X_{1t}, \ldots, X_{at}$ is the variable for indicating attributes. P_j indicates the levels assigned to the attributes. P_j is assumed to be 2 because the survey is conducted on the basis of three equal attributes.

3.6 Survey design

The survey is designed to elicit general data on the ride-hailing industry and to examine the attributes that were identified in the exploratory interviews and the literature review. The survey consists of two parts. The first is designed to understand the market in general and the behaviour of young consumers. Both parts of the survey consist of 12 questions. The results from the first part are used to verify the interview results and, later, to understand the target group.

The following key variables, which reflect the literature review, were selected for analysis: pricing, convenience, and speed. The selection of the sample was driven by the considerations outlined in the previous chapter, and it was intended to ensure that the behaviour of young customers could be observed. The questions were designed carefully to guarantee that the results would be valid both externally and internally. Since it is difficult to execute a full factorial design, an orthogonal choice set is used for the conjoint analysis.

Most of the results have been collected in the Netherlands and South Korea. In this thesis, the cross-cultural survey is conducted for the following reasons. First, Uber aims to provide globally homogeneous services. Thus, it seemed to be realistic to merge the survey results of several countries. Second, key attributes are mutually considered as important. For example, matching time, and conveniences are both important attributes that are shared unanimously in several countries. A multitude of respondents gives validity to the study. However, due to the COVID-19 pandemic during the period in which this thesis took place, it was difficult to collect the surveys throughout different regions.

The survey includes “nationality” and basic background of the interviewee to enable a verification of the effects of different “transport-cultures”.

Chapter 4 Data

4.1 Sample selections for in-depth interviews

The interview questions were designed to elicit information about the industry and consumer behaviour. The similarities and differences between taxi businesses and the ride-hailing industry were examined previously.

Key consumer behaviour was described previously. NHTS research from 2017 indicates that younger, educated individuals tend to use ride-hailing services more frequently (NHTS, 2017). The result was confirmed in a 2018 follow-up study. Research

from Australia also identified younger, educated customers as the most frequent ride-hailing users (Soltani et al., 2021). The interviewees were therefore selected to enable observations of the behaviour of the young. The three interviewees were Byunghyun Park from the Port of Busan Authority, Wooyoung Chae from LS-IS Europe, and Can Pekdemir from VCA Zuid Holland.

In-depth interviews were conducted with the interviewees mentioned above. The in-depth interview is designed to collect the general information and perceptions about the ride-hailing industry in the Netherlands and South Korea.

4.2 Sample selection for survey

The selections of survey respondents reflect similar considerations. Previous researches suggested that ride-hailing users are younger than the general population (Clewlow & Mishra, 2017; Rayle et al., 2016). The point is reaffirmed in an Australian research (Soltani et al., 2021). Moreover, ride-hailing requires a firm grasp of smartphone and information technology systems. Young people are typically more open to adopting new technologies.

Since the thesis aims to identify the key attributes of ride-hailing service industry's main consumers, sampling broad age groups could dilute the results. However, within the chosen age group, the online surveys were conducted at several universities in the Netherlands, including Erasmus University Rotterdam, and with employees of several companies. As a result, the samples are diverse, and bias within the age group is minimised.

Chapter 5 Results and conclusion

5.1 Result from the interviews

Interviewees for in-depth interviews are selected based on the findings in the literature review. Previous research suggested that most users are young people. Accordingly, the interviewees were selected based on the criteria as follows; recent graduates, working in the industry, and having exposed to the services in several countries.

In summary, people generally prefer to use the public transportation, because of the traveling time and timing accuracy. On the other hand, people prefer to use the taxi when there is no available alternative public transportation, and possibility of sharing prices. In these cases, matching times are important. However, the importance of the convenience factor is varying on the interviewees.

The interviews were conducted to identify the key attributes of the ride-hailing industry. While O2O platforms are often characterised by two sides, suppliers, and consumers, this thesis aims to look at the consumer side and has interviewed the potential consumer in the industry. Different themes were identified and analysed. The three main themes revolved around these attributes “price”, “convenience”, and “matching time”. Several ride-hailing applications were examined to identify those themes.

Theme	Respondent	Position
Reasons for preferring taxis over ride-hailing services	Can Pekdemir	Prefers ride-hailing because it is cheaper than taxis
	Byunghyun Park	Prefers to use the application because it is cheaper in several countries
	Wooyoung Chae	Always prefers to use ride-hailing services because they are convenient and because the use of maps makes them more trustworthy
Reasons for preferring ride-hailing over public transportation	Can Pekdemir	Ride-hailing services are cheaper or as expensive as public transportation when the price is shared between several individuals
	Byunghyun Park	Prefers public transportation because it is usually faster than ride-hailing services in South Korea and the Netherlands
	Wooyoung Chae	Prefers public transportation because of its price

Table 1: Comparing ride-hailing services to other transportation services

According to the interviewees, there are several reasons why individuals prefer ride-hailing over taxis, of which the price is the foremost. This verifies the NHTS (2017)'s findings: expense seems to be a critical factor in several continents.

Consumers often consider public transportation as a cheaper alternative to other transportation services. Remarkably, public transportation is sometimes faster than ride-hailing and taxi services. Traffic is the most likely cause. Moreover, ride-hailing services are highly dependent on the condition of the public transportation system. The use of public transportation entails a trade-off between matching time and convenience.

Theme	Respondents	Illustrative excerpts
Car types and the conditions	Can Pekdemir	"Car types are sometimes important. Since I have a car, I only need specific car types."
	Byunghyun Park	"Car types are not an important criterion for me. However, I always prefer the better car."
	Wooyoung Chae	"Car condition is important, but I cannot choose when I request a service."
Luxury segmentation	Can Pekdemir	"Luxurious cars are always better. However, it depends on the price."
	Byunghyun Park	"I do not actively look for luxurious cars, but I prefer to choose a better car."
	Wooyoung Chae	"I do not actively look for a luxury car. Budget is more important."

Table 2: Key attributes of service expectations

Ride-hailing services are akin to traditional taxi services. Firstly, in both cases, customers care about satisfaction. Secondly, ride-hailing services are needed only for specific occasions, just like taxis. At present, the public still believe that ride-hailing is more expensive than public transportation.

Theme	Respondents	Illustrative excerpts
Satisfaction with ride-hailing services	Can Pekdemir	"Since I have a car, I require only a specific type of service."
	Byunghyun Park	"Trustworthiness is quite an important factor. It can be checked through the driver's ratings in the app. However, I have not seen driver's ratings below four yet."
	Wooyoung Chae	"When I was in South Korea, sometimes I was annoyed by conversations with taxi drivers."

Table 3: Service type segmentation

Taxis offer fewer services than ride-hailing businesses. Uber enables users to select between more options. The interviewees indicated that they used Uber services in line with their specific needs.

Theme	Respondents	Illustrative excerpts
Fast matching	Can Pekdemir	"Fast matching is important. It depends on the situation."
	Byunghyun Park	"Fast matching is always better than slow matching. However, I do not want to pay extra for fast matching."
	Wooyoung Chae	"Fast matching is often required when I use ride-hailing services."
Ideal time to match	Can Pekdemir	"Maximum of 30 minutes, considering the waiting times for alternatives."
	Byunghyun Park	"Maximum of 15 minutes; it depends on the alternatives."
	Wooyoung Chae	"Depends on the price. I do not want to pay extra for fast matching services."

Table 4: Fast matching

Fast matching is important for the consumers. Most of them also consider using public transportation. Much depends on local specificities. For example, in South Korea, it is easier to catch a taxi in the street; in the Netherlands, calling a taxi is common. Consumer perceptions differ accordingly.

Theme	Respondents	Illustrative excerpts
Sharing with others	Can Pekdemir	"Matching time is an important factor for me when I use taxi services. However, on some specific occasions, I actively look for someone with whom I can split the cost."
	Byunghyun Park	"Depends on the price. Only if it is more than 100 euro."
	Wooyoung Chae	"I do not mind sharing a car with others. I sometimes actively look for someone to split the cost."

Table 5: Sharing rides

Having reviewed the current research in ride-hailing industry, in chapter 2, previous research has found when the ride-hailing services are used. For example, ride-hailing services are mainly used to go for a leisure in the United States. Several key attributes of the customers of app-based ride-hailing and taxi emerge. Matching times matter to them, and they are open to ridesharing, depending on prices.

On the other hand, the interviews do not indicate unanimous of these motivations. For example, while Can and Wooyoung responded that they would actively consider ride-sharing at any distance, Byunghyun indicated that he will consider ride-sharing only when the distance is far, thus, only at a high price. In addition, some wanted better cars but did not necessarily want to pay a premium. The information obtained through the interviews is thus limited. In result, survey was formulated and subjected to conjoint analysis to discover the frequency and the intensity of the motivations.

5.2 Results from the survey

The data collection process yielded 64 responses. All respondents have lived in a metropolitan area with more than four transit systems, and they have experience with app-based ride-hailing or taxi services. Responses were mainly collected from the Netherlands and South Korea. All respondents were aged between 20 and 35, which ensured the internal validity of the results.

Reasons	Respondents
No available transit	14.67% (28 respondents)
Weather	14.13% (26 respondents)
Cannot drive	13.04% (24 respondents)
Quicker than transit	20.65% (38 respondents)
Multi-tasking option	13.59% (25 respondents)
Cheaper than expected	10.33% (19 respondents)
Cost sharing	11.96% (22 respondents)

Table 6: Main reasons for considering app-based ride-hailing or taxi services

According to the Table 7, Most respondents considered using transportation if they needed to cover a distance in excess of 2 km. There might be intercultural differences between perceptions of hardship.

Distance	Respondents
More than 1 km	20.31% (13 respondents)
More than 2 km	40.63% (26 respondents)
More than 4 km	28.13% (18 respondents)
More than 6 km	6.25% (4 respondents)
More than 8 km	4.69% (3 respondents)
Total	100% (64 respondents)

Table 7: Distance and transportation

Most of the respondents had installed more than one ride-hailing or taxi app. The table below shows the number of applications installed.

Number of Applications	Respondents
0	10.94% (7 respondents)
1	48.44% (31 respondents)
2	32.81% (21 respondents)
3	6.25% (4 respondents)
4	1.56% (1 respondents)
Total	100% (64 respondents)

Table 8: Number of ride-hailing application installed

Most respondents were not interested in installing additional applications because they were satisfied with the ones that they had at their disposal. However, there was still room for improvement: 30% were interested in discovering cheaper applications.

Additional Application	Respondents
Yes	37.50% (24 respondents)
No	62.50% (40 respondents)

Table 9: Willingness to install additional ride-hailing applications

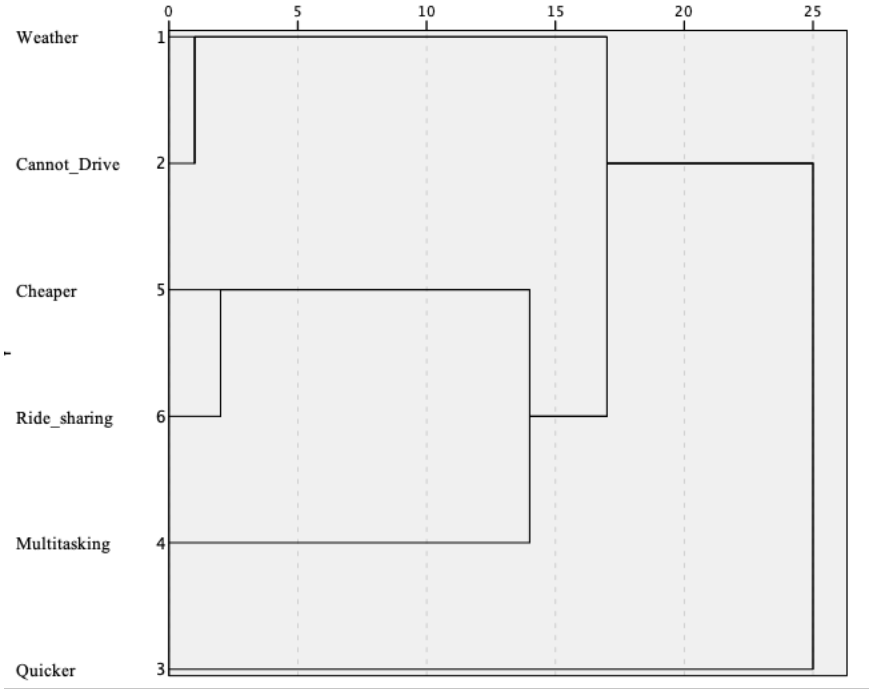
The survey was designed to elicit reasons. For the most part, consumers were looking for cheaper ride-hailing applications. Some of them were dissatisfied with current matching times.

Reasons	Respondents
Alternative app would be cheaper	46.67% (14 respondents)
Current app has longer matching time	20.00% (6 respondents)
More drivers in alternative app	13.33% (4 respondents)
Additional features in alternative app	10.00% (3 respondents)

Table 10: Reasons for installing additional application

Clustering analysis was used for segmentation. First, a dendrogram was derived to define the clusters. Thereafter, *k*-means clustering with Ward's method was used. According to the survey, there are 39 usage profiles. Considering that 64 respondents answered the survey, some respondents were reclassified through clustering analysis. A total of 39 profiles were classified on the basis of the dendrogram[1].

[1] If you are interested in detail, the further information can be found on the following thesis: Jolliffe, I. T., Allen, O. B., & Christie, B. R. (1989). Comparison of variety means using cluster analysis and dendrograms. *Experimental Agriculture*, *25*(2), 259-269.



Graph 1: Dendrogram used to cluster reasons for using ride-hailing or taxi services

The dendrogram shows the relationships of a certain group of entities' similarities displayed on a branching system. Since the research used the dendrogram to find out the best number of clusters, the algorithm starts on the left. The procedure starts with drawing a vertical line on the graph from the left. The points where the vertical lines meet the graphs yield the number of clusters. The first vertical line drawn from the beginning yielded 6 clusters. Likewise, a vertical line is drawn to determine that there are no sudden jumps in the graph. There was a sudden jump yielded on 3 clusters. Thus, 4 clusters were concluded to be best on the given dendrogram.

Reasons	**Groups**			
	Group Reason 1	**Group Reason 2**	**Group Reason 3**	**Group Reason 4**
Weather	0.06	0.81	0.83	0
Cannot drive	0.09	0.94	0	0.6
Quicker	0.53	0.63	0.33	0.9
Multi-tasking	0.34	0.31	0.17	0.8
Cheaper	0.03	0.31	0.5	1
Ride sharing	0.16	0.06	1	1
No option	0.22	0.69	0	0.9

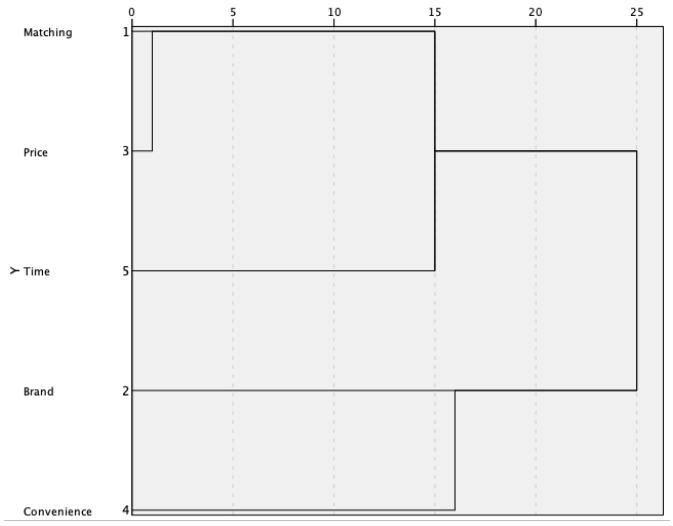
Table 11: Interpretation of results displayed via Reasons and Groups

Group Reason 1 respondents are characterised by a desire for quicker rides and multi-tasking. Group Reason 2 respondents only use taxi or ride-hailing services when public transit is unavailable, when weather conditions are poor, or because they cannot drive. Group Reason 3 respondents are animated by economic considerations. They also favour quicker trips and ridesharing options, and they are affected by the weather. Group Reason 4 uses ride-hailing services when no alternatives are available, when they are quicker, when the weather is poor, or because they cannot drive.

Group	Respondents	Share
Group Reason 1	32	50%
Group Reason 2	16	25%
Group Reason 3	6	9%
Group Reason 4	10	16%
Total	64	100%

Table 12: Shares of groups

Current market segmentation on the basis of this attribute indicates that many use the service because of its convenience. This said, the results for Group Attribute 2 show that a significant proportion use apps because of a lack of alternatives. Therefore, similarities remain between app-based services and conventional taxis. The attributes were classified through clustering so that their importance could be ascertained. The number of clusters was derived from dendrograms.



Graph 2: Result at the centre of the attributes cluster

Attributes	Groups			
	Group Attribute 1	Group Attribute 2	Group Attribute 3	Group Attribute 4
Matching	1	0	0	1
Brand	1	0	0	0
Price	1	0	1	1
Convenience	1	1	1	0
Time	1	0	1	0

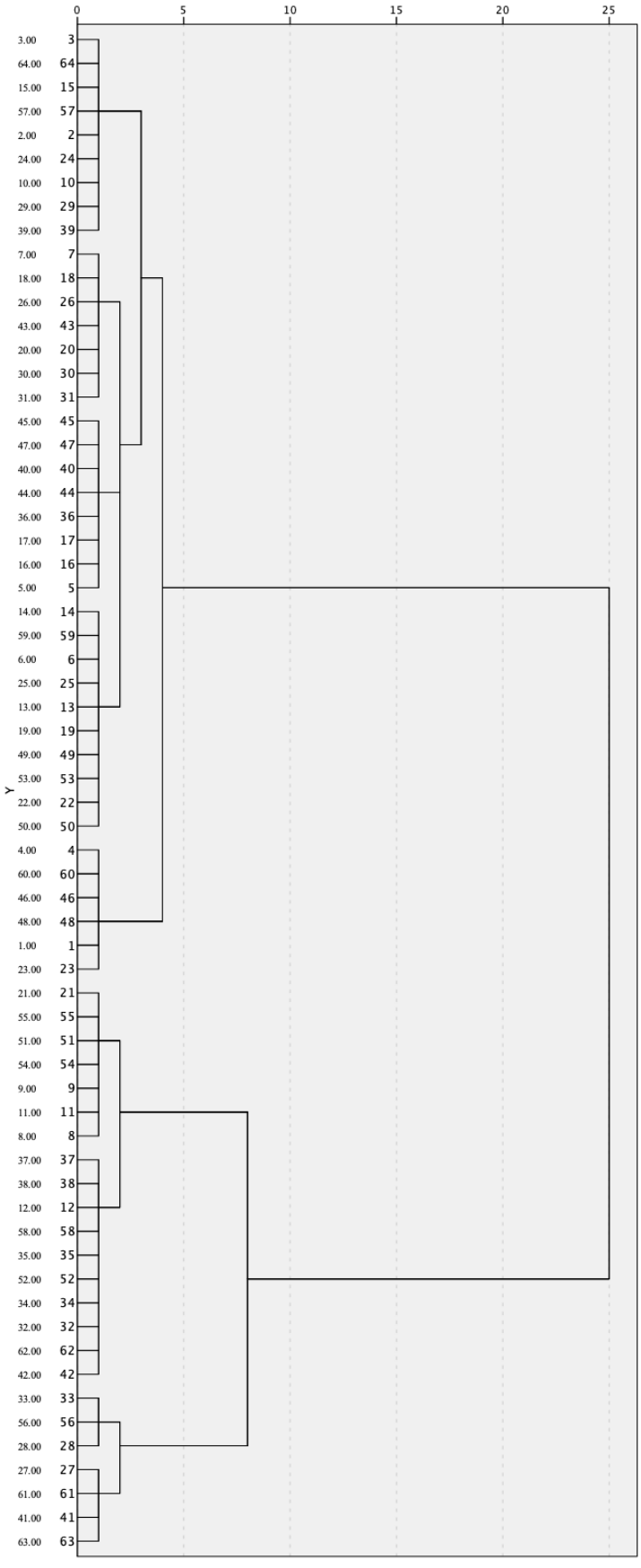
Table 13: Interpretation of results displayed via Attributes and Groups

The attributes that are important for Group Attribute 1 are matching time, brand, price, conveniences, and speed. Group Attribute 2, traditional taxi users, only attach importance to convenience. Group Attribute 3 are particularly sensitive to time, price, and convenience. Group Attribute 4 pay attention to matching times and prices. There are similarities with previous findings in the reasons.

Group	Respondents	Share
Group Attribute 1	17	27%
Group Attribute 2	12	19%
Group Attribute 3	10	16%
Group Attribute 4	25	39%
Total	64	100%

Table 14: Shares of groups

Group Attribute 1 comprises traditional luxury taxi service consumers. They expect the best possible experience, and their expectations circle on matching time, car brand, convenience, and travel times. Group Attribute 2 only consider convenience. Group Attribute 3 do not place much emphasis on luxury, but they care about travel time and convenience. One interpretation is that they only use taxis at budget prices and on special occasions, such as job interviews, when they must conserve energy. Group Attribute 4 are sensitive to price and matching times. These groups use ride-hailing services in emergencies, but not in quotidian situations.



Graph 3: Dendrograms using Ward's method

Graph 3 is the dendrogram that reflects the findings described on the preceding pages. Consequently, four clusters were selected. They are described below[2].

Features	Groups			
	1	**2**	**3**	**4**
Distance	1	6	2	8
Installed	4	3	0	1
Group Reason 1	0	0	1	1
Group Reason 2	0	1	0	0
Group Reason 3	1	0	0	0
Group Reason 4	0	0	0	0
Group Attributes 1	0	0	0	0
Group Attributes 2	0	0	0	1
Group Attributes 3	1	0	0	0
Group Attributes 4	0	1	1	0

Table 15: Segmentation based on survey findings

Once the customers are clustered into groups, the features are used to derive their characteristics. The variables mentioned in the tables are from the previous clustering of each sub-group. The findings from the previous sections are used to summarise the results for the four groups, and they will be used for segmentation.

Group 1 use transportation services when they must travel a distance of more than 1 km. They typically install four applications because they use transportation frequently. They aim to identify cheaper options, and they emphasise travel time and convenience over luxury.

Group 2 use transportation services when travel distance exceeds 6 km. Since they travel over longer distances, they typically install three ride-hailing applications on their smartphones. Since they travel for longer periods of time, it is possible that Group 2 consumers use the taxi or ride-hailing services only when public transit is unavailable. Their emphasis on price and matching times also points to this conclusion. They use the service in emergencies.

[2] Detailed description of the attributes and the reasons can be checked on the previous findings at page 25, and 26.

Group 3 use transportation when they must travel more than 2 km. They strive to select the cheapest option. Remarkably, they are clustered, and they have installed 0 ride-hailing applications on average. They use ride-hailing services because they are cheaper and quicker, because rides can be shared, and because the weather sometimes prevents them from walking.

Group 4 consumers use ride-hailing because they are quicker and because they enable them to multi-task. They only use ride-hailing services for distances of more than 8 km and installed only 1 application. The findings indicate that Group 4 might be suffering from the limited availability of public transit options.

Segment	Respondents	Share
Group 1	16	25%
Group 2	21	33%
Group 3	24	38%
Group 4	3	5%
Total	64	100%

Table 16: Segmentation and shares

Remarkably, Group 3 account for 38% of the sample, and they have installed 0 applications. Evidently, a marketing promotion plan is required to target this group.

The thesis selected two nations to compare, which are the Netherlands and South Korea. Both countries are densely populated, and taxi services are perceived to be comfortable transportation. Most importantly, Uber is active in both countries as an app-based ride-hailing service. Since the surveys are mainly collected in those two countries, the thesis further examined whether the assumption was valid in this research. There were 29 observations collected from South Korea, and 22 observations were collected in The Netherlands. There were 13 respondents were from other countries. However, since the other countries had small observations and varied over countries, the 13 samples were exempted from the research. Thus, T-tests were executed between survey results from Dutch and South Korean respondents to compare whether responses had similarities.

Considering that the respondents are not enough, these results only can be used to get a brief picture of the industry.

Reason	Mean		Standard Deviations		t-value	p-value
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
No option	0.2069	0.7727	0.41225	0.42893	-4.771	<.001
Weather	0.3103	0.6818	0.47082	0.47673	-2.776	0.008
Cannot drive	0.3103	0.5909	0.47082	0.50324	-2.046	0.046
Quicker	0.6552	0.5909	0.48373	0.50324	0.462	0.646
Multitasking	0.4483	0.3182	0.50612	0.47673	0.932	0.356
Cheaper	0.069	0.5909	0.25788	0.50324	-4.442	<.001
Ride sharing	0.1724	0.5	0.38443	0.51177	-2.512	0.016

Table 17: Comparison with the reasons

Under the confidence level of 95 percent, the people in the Netherlands and South Korea ride a taxi because it is quicker and has a multi-tasking option. However, there are differences on no option, weather, cannot drive, cheaper than expected, and ride-sharing options. Consumers in the Netherlands value more in price reasons, for example, cheaper than expected, and ride sharing options. Conversely, South Korean consumers do not value much on the no alternative options and weathers. In summary, consumers in the Netherlands consider the services when the alternative option is not available, thus consider the prices relatively higher than South Korean consumers. Since there are more public transportation available in the metropolitan area, people use the service because of the comfort options, which verifies the findings in the interview.

Thus, the thesis further examined whether the reason attributes were same over the countries.

Classified Reasons	Mean		Standard Deviations		t-value	p-value
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
Group Reason 1	0.59	0.18	0.501	0.395	3.223	0.002
Group Reason 2	0.2759	0.2727	0.4549	0.45584	0.024	0.981
Group Reason 3	0.1034	0.3636	0.3099	0.49237	-2.173	0.037
Group Reason4	0.0345	0.1818	0.1857	0.39477	-1.62	0.116

Table 18: Comparison with classified reason classifications

There were significant differences on Group Reason 1, and Group Reason 3. In proof, P-value suggested that there are remarkable differences between these two groups. Group Reason 1 was significantly higher in South Korea while Group Reason 3 was significantly higher in the Netherlands. As described earlier, Group Reason 3 people do not place much emphasis on luxury. However, they care about travel time and convenience which is in line with the previous findings. Additionally, South Korean respondents answered in Group Reason 3 that they put more preference on quicker and multi-tasking.

Likewise, similar t-test has been conducted for the attributes. Based on the findings, matching time is important in both countries. However, prices are considerably important in the Netherlands. Moreover, travel time is more important in the Netherlands. Probably it is due to the available public transportation in the cities. Interview results suggested that people in South Korea do not really consider the taxi as the faster transportation compared to the others. The t-test results verify the findings in the interviews.

Attributes	**Mean**		**Standard Deviations**		**t-value**	**p-value**
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
Matching	0.7586	0.7273	0.43549	0.45584	0.25	0.804
Brand	0.0345	0.1364	0.1857	0.35125	-1.338	0.187
Price	0.6207	0.9091	0.4938	0.29424	-2.596	0.019
Convenience	0.3793	0.6364	0.4938	0.49237	-1.843	0.071
Time	0.2414	0.9091	0.43549	0.29424	-6.524	<.001

Table 19: Comparison with attributes

Considering, the limited number of respondents in the survey, the attributes are also classified by using the segmentation. Based on the findings below, the considered attributes are different over the countries. While South Korean respondents are mainly grouped in Group Attribute 4, the consumers in the Netherlands are grouped in Group Attribute 1**.** As described earlier, Group Attribute 1 comprises the traditional taxi service consumers. Matching time, car brand, convenience, and travel times are important for Group Attribute 1. Group Attribute 4 comprises the pricings. This does not mean that South Korean

consumers do not put value on other features. This rather needs to be interpreted as the consumer expectations are higher in the Netherlands, due to the higher prices.

Classified Attributes	Mean		Standard Deviations		t-value	p-value
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
Group Attribute 1	0.1724	0.4545	0.38443	0.50965	-2.17	0.036
Group Attribute 2	0.2414	0.0455	0.43549	0.2132	2.112	0.041
Group Attribute 3	0	0.2273	0	0.42893	-2.49	0.021
Group Attribute 4	0.5862	0.2727	0.50123	0.45584	2.33	0.024

Table 20: Comparison with classified attributes

Similarly, the t-test is also conducted to check whether there are significant differences in both countries. The characterizations of Group 2, and Group 3 were similar in both countries. However, South Korean respondents were mainly classified in the Group 1 while the consumers in the Netherlands were classified the Group 4. As described earlier, Group 1 consumers are characterized by the traditional taxi services users. Group 4 consumers are considered as the people who use the taxi services in only necessary occasions.

Segment	Mean		Standard Deviations		t-value	p-value
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
Group 1	0.6207	0.1818	0.4938	0.39477	3.526	<.001
Group 2	0.2759	0.3636	0.45486	0.49237	-0.66	0.513
Group 3	0.069	0.1364	0.25788	0.35125	-0.79	0.433
Group 4	0.0345	0.3182	0.1857	0.47673	-2.64	0.014

Table 21: Comparison with segmentation

This research was designed to collect the survey response globally. During the study, the survey was mainly collected from the Erasmus University Rotterdam student population, thus the respondents are mainly collected from South Korea and the Netherlands. The previous study tells that the populations might be homogeneous over the continent, as Australia and United States showed similarities by Solitani et al (2020). However, the findings in this research suggest that the consumer attributes are perceived differently over countries, despite Uber serves the homogeneity service in these countries.

The main differences arise from the level of public transportation infrastructure. In general, consumers in the Netherlands tend to consider price as more important while the consumers in South Korea consider more the comfort

5.3 Results of conjoint analysis

There are several conditions for performing a conjoint analysis. First, attributes need to be explained well during the survey. Clear explanations were accordingly provided in the introductory section of the survey. Moreover, conjoint analysis yields a precise answer when equal levels are selected for each attribute. Therefore, each attribute is designed to have three levels. Some attributes, such as sharing a car with strangers, matching time, car conditions, and car type, were added.

Attribute	Level
Car types	Luxurious car
	Sedan
	Ordinary car
Car condition	Good condition
	Normal condition
	Bad condition
Matching time	15 mins
	30 mins
	45 mins
Ridesharing	0 additional strangers
	1 additional stranger
	2 additional strangers

Table 22: Conjoint attributes and levels

The findings from the literature review and the interviews enabled 12 variables to be selected on the basis of the key attributes. Those variables are used to probe marginal utility. A function was created for specific consumer needs. For example, vehicles that can transport pets and vans are only used on specific occasions. Therefore, they are not characteristic of the standard use of ride-hailing services. Such specificities could not be assessed through the survey because they might have biased the results. Therefore, these

attributes were excluded from the research. Kendall's tau and Pearson's R showed that the orthogonal choice set of the conjoint analysis satisfies the reliability criterion.

Test	Value
Pearson's R	< 0.001
Kendall's tau	< 0.001

Table 23: Reliability of the orthogonal choice sets

The conjoint analysis shows that matching and car condition affect consumer decisions. However, their effect is not as pronounced as expected. The table below shows that the consumer values that were used to calculate the importance levels of the attributes.

Attribute	Average Importance Value
Type	9.549
Condition	19.832
Matching	58.578
Sharing	11.962

Table 24: Average importance value

The table below shows estimated utilities. Provided that the price of a luxury car and an ordinary car is the same, customers always prefer the luxury car. The use of an ordinary sedan decreases utility. More recent car models are always preferred. However, the use of a more recent model does not affect the utility of the ride significantly. Customers care more about car condition than about car type.

Attribute	Importance	Level	Estimated Utility
Car type	10%	Luxurious car	0.231
		Sedan	0.019
		Ordinary car	-0.250
Car condition	20%	Good condition	0.295
		Normal condition	0.353
		Bad condition	-0.647
Matching time	59%	15 mins	1.443
		30 mins	0.072
		45 mins	-1.515
Ridesharing	12%	0 additional strangers	0.173
		1 additional stranger	-0.388
		2 additional strangers	0.215

Table 25: Conjoint analysis

Since ride-hailing services share characteristics with the taxi industry, carsharing consumers are segmented in extremes: they either favour comfort or they strongly prefer economy. According to the conjoint analysis, the ability to share rides with strangers does not provide any value to consumers.

The survey respondents were located in various countries due to COVID-19 restrictions. Most surveys were completed by respondents who lived in South Korea or the Netherlands.

Attribute	Level	Est. Utility KR	Est. Utility NL
Car type	Luxurious car	0.374	-0.015
	Sedan	0.053	-0.030
	Ordinary car	-0.428	0.045
Car condition	Good condition	0.399	0.106
	Normal condition	0.350	0.273
	Bad condition	-0.749	-0.397
Matching time	15 mins	1.597	1.167
	30 mins	-0.107	0.394
	45 mins	-1.490	-1.561
Ridesharing	0 additional strangers	0.263	-0.015
	1 additional strangers	-0.453	-0.318
	2 additional strangers	0.189	0.333

Table 26: Comparison of results from the Netherlands and South Korea

The results do not differ considerably from the generalised ones presented earlier, although some small differences can be observed. Dutch customers are less interested in car types and prefer ordinary vehicles. Therefore, differentiation is not significant when a luxury car is expensive.

5.4 Segmentation and marketing implications

5.4.1 Segmentation in the current industry

The current segments are based primarily on car condition and type as well as rates. As noted, there are many similarities with the segmentation of the conventional taxi industry: Uber Comfort is similar to ordinary taxis, and Uber Black is similar to luxury taxis.

Type	Features
Uber X	Low-budget, affordable rides
Uber Comfort	More recent car models with high-rated drivers
Uber Black	High-end cars with high-rated drivers

Table 27: Current segmentation of Uber in the Netherlands

The young and the educated, currently account for a majority of ride-hailing consumers. The survey and the conjoint analysis suggest that the segmentation which follows is appropriate.

	Travel Distance	Transportation	Key reason	Matched segment
Group 1	Shorter travel (1 km)	Frequent users	Efficiency	Uber X
Group 2	Longer travel (6 km)	Frequent users	Efficiency	Uber X
Group 3	Longer travel (2 km)	Frequent users	Cannot drive, weather	Uber X
Group 4	Longer travel (8 km)	Infrequent users	Need-based	Uber X/Uber Comfort/Uber Black

Table 28: Suggested segmentation

Briefly summarizing the findings in the previous chapter, after clustering, the consumers were divided into four groups. Remarkably, the groups exhibit significant travel-range differences. In general, all emphasise speed and convenience. The findings indicate that Groups 1-4 only match one or two of Uber's segments. Group 1 can be characterised as Uber X users, and they are the most difficult to satisfy because they

consider the widest array of attributes, including convenience, price, speed, and multi-tasking. Group 3 use alternative transportation methods for their usual routes. They share rides with others, and they pay particular attention to price. Ridesharing plans must be adopted if they are to be targeted. Group 4 have no other options and must use taxis.

5.4.2 Marketing implications

The design of an effective marketing strategy must refer back to consumers. Their key characteristics have been identified. A general strategy of decreasing prices would not necessarily improve quality. Moreover, travel time must match that of existing taxi services. All consumer groups consider price to be important, and they are interested in quicker transport. Time must be considered. Motion plans can increase the number of installations. No applications are installed. It would be beneficial to develop a mile-to-mile application to gather more information about consumers.

On-demand classification is needed. Data must be collected in order to refine the definitions of the sub-groups. The findings presented here indicate that consumer behaviour varies with distance travelled. Therefore, more data on travel distance would enable more effective strategies to be designed.

Group 3 can be targeted through promotion plans. They travel frequently, and many of them cannot drive. They use transportation for distances in excess of 2 km. Among the respondents, who were young, 38% had not been exposed to app-based taxi or ride-hailing services. Price and ridesharing plans, which are liable to decrease prices, are important to them. Promotions should reflect these values. The conjoint analysis and the clustering analysis confirm this result.

Based on the findings in the characteristics of each segmentation, the research further suggested the key criteria for the marketing implications. Following table describes the required actions based on the clustering analysis. The Table 29 is described by classification of new entrants and the current market player. In addition to that, the table suggests the marketing strategy for current and potential consumers in summary.

Although Uber is providing homogeneous services all over the world, different promotion plans are required in different countries. Though the price is both important for young population in both countries, there are differences on the attributes. For example, as verified in this research, South Korean consumers are more likely to value the comfort. On the other hand, the consumers in the Netherlands are more likely to value on the pricing options

Ride-hailing services need to look an eye on the deficit or cancelled public transportations to conduct on-time promotion to its potential consumers. As it suggested, the consumers in Netherlands is more likely to use the ride-hailing/app-based taxi services based on the possibility of alternative transit options. On the other hand, Uber needs to improve the comfort services within consumers budget in South Korea. At the same time, Uber needs to create the perceptions that Uber is providing homogeneous service all over the world.

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Levels	Description			
		New Entrants	Current Market Player	
Understanding consumer	Market Players	Automotive manufacturers	Current Ride-hailing services	Traditional Taxi services
	Example	FAW-Volkswagen	Uber	Current taxi services
	Current Consumers	**Not Applicable**	**Group 1, Group 2, Group 4**[3]	**Group 1, Group 4**
	Current Consumer Characteristic	Not Applicable	Need based, frequent travelers	Need based, mixed up with frequent travelers and infrequent travelers
	Potential Consumers	**Group 1, Group 2, Group 3, Group 4**	**Group 3**	**Group 3**
	Potential Consumers Characteristic	Need based, who are familiar with public transportation	Need based, price lovers	Need based
Current Consumer Strategy	Pricing	Reducing prices based on the new available features	Reducing prices based on collected data	Do not required to reduce the prices
	Promotion	Promotion plans to acquire both current consumers and targeting the Group 3 consumers	Promotion plans to keep the interest on the applications	Promotion plans to keep interest of the current consumers.
	Quality Improvement	Improve the ride-sharing feature and autonomous driving features	Develop mile to mile application	Needed to be stay as the top transportation method
Potential Consumer Strategy	Pricing	Reducing prices based on the additional possible features	Reducing the prices based on current data collection	Might need to reduce the prices to follow the trend
	Promotion	Promotions for the new users.	Suggesting based on the weather conditions	Promotions based on the additional feature
	Quality Improvement	Developing features that can be convenient based on the ride-sharing feature	Developing features about time accuracy, and estimations.	Focus on the current development to find additional conveniences to the its competitors

Table 29: Summary of marketing implication

[3] The details of the consumer characteristics are based on the findings in the segmentation in the previous chapter 5.2 "Result of the survey".

5.5 Conclusion

New applications are launched every day, and new generations are adapting to digital transformation quickly. The ride-hailing industry attracts scholarly attention because the market tends to change rapidly. This thesis began with a review of the relevant academic literature. It emerged that ride-hailing services are similar to taxis. The interviews focused on identifying the differences between the two and on comparing them to public transportation. Price and quality emerged as significant differences. A survey was then subjected to conjoint analysis to identify the key attributes of the industry.

The interviews suggest that price and matching times are essential. Some would like to share rides; others would not. It was also found that app-based ride-hailing or taxi services offer a more convenient means of reaching inaccessible locations. This said, the interviewees were not unanimous. Therefore, the question was investigated further through a survey.

The results of the survey suggest that most current users are willing to install additional applications if lower matching times and prices are on offer. Moreover, approximately 70% of respondents required transportation if they had to cover a distance in excess of 1 km. Speed was one of the main reasons for using app-based ride-hailing services and taxis.

Since there are many variables in the research, this thesis clusters the samples with the variables, specifically reasons and attributes. These clustered variables are examined to see the segmentations in detail. Remarkably, the reasons vary depending on the alternative transit options, economic considerations, and weathers. The attributes vary based on the conveniences, matching time, and prices.

Based on the reduced dimension, the thesis further examined for clustering. Ride-hailing services has been used by Group 1 due to its' quickness and cheaper prices. When travel distance exceeds 6km, it is also used by Group 2. Since the distance travelled is longer, three ride-hailing applications are typically installed on their smartphones. 38% of

the respondents, who are non-user of ride-hailing services, are classified in Group 3. When alternatives were unavailable, Group 4 respondents only used the services in question. Based on the characteristics of the defined 4 subsegments of the young urban consumer market for ridesharing taxis, the following conclusions and suggestions emerge for new participants in this market.

Since the survey turned out that respondents are mainly collected from South Korea and the Netherlands, the thesis further checked whether the attributes and the reasons are perceived differently between these two countries. The key finding is that consumers in the Netherlands value cheaper rides whilst Korean consumers portray higher value in comfort.

The findings from the literature review and the interviews were used to set attribute levels for the conjoint analysis. The respondents did not exhibit a strict preference for luxurious cars. Instead, affordability was paramount, as were matching times. The conjoint analysis revealed that ridesharing does not command widespread acceptance.

In summary, price matters. The young are price-sensitive because they have limited budgets. The survey indicates that prices are not compared in relation to each other; it is the budget line that matters. Based on the findings in this research, still, ride-hailing services are considered expensive in several markets. Though the service is relatively cheaper, it has not yet have been promoted to the consumer, which results in 38% of current consumers considered as not a user.

The conjoint analysis confirmed this finding. Luxury was relatively insignificant: consumers seem to be very pragmatic. Even the current taxi-like vehicle, not a general vehicle, emerged as a result. Combined with the clustering analysis results, there is a huge room exists for new entrants, as far as satisfying key conditions. For example, reducing the prices, while maintaining the convincing features as the taxi industry. These conclude that the current car manufacturer has room to enter this market with the additional features that can potentially reduce the prices. This means that Uber still needs to improve on current market share and making an extensive promotion to new consumer with the price reduction.

Chapter 6 Limitations and future research recommendations

6.1 Limitations of the research

Due to the COVID-19 pandemic, most members of the public now work virtually. As a result, the use of transportation has decreased significantly. This development may have skewed the responses of the interviewees. In addition, obtaining an interview with company CEOs is becoming increasingly difficult. Repeating the interviews and recruiting other interviewees might therefore present a promising avenue for future research. Since the survey only attracted 64 respondents, the clustering analysis and the conjoint analysis might lack external validity.

There are different behaviours between the countries. For example, in Korea, or Spain is easier to grab a taxi on the way. However, in the Netherlands, it is more typical to call a taxi on the application. To have the number of respondents, it has been assumed that the Netherlands and South Korea are both densely populated areas and show similar behaviour. However, as shown in the research, it needs to be further examined of the cross-cultural survey.

Trends among the young change constantly, and the same survey might yield different answers in a decade. New generations find it easy to adapt to new technologies, such as smartphones. Although this research aims to target young people, the perspectives of 20s populations vary. Due to COVID-19, the survey was conducted online and had to be circulated among young individuals around the globe. It is assumed that there has been no significant change in attitudes between 2018 and 2020. The results from the conjoint analysis suggest that culture may affect decisions to use ride-hailing surveys.

According to Hooley and Lynch (1981), a small sample cannot yield representative answers. Although the survey was circulated widely, relative to the population, the sample was small: there were only 64 respondents. Since samples were scattered around the globe, it is difficult to gauge the validity of the study. Moreover, the industry is changing rapidly. Current segmentation criteria may change upon the introduction of new features. For

example, fast matching was just introduced to the Kakao Mobility application in South Korea. Uber Pet was also launched recently. This said the industry is still evolving.

6.2 Recommendations for future research

Given the pace of change in the ride-hailing sector, continuous research is required. Here, it was possible to classify the characteristics of the 20s and to discover which attributes they consider important. Therefore, future research may focus on the identification of additional attributes of interest.

Although price is important to the design of the study, it was not subjected to conjoint analysis. The primary objective of the design of the conjoint study was to determine the importance of attributes. The price factor was excluded in the conjoint analysis. The more economically minded would prefer to share rides. Thus, it might cause multicollinearity problems within the analysis. Subsequently, the study established that price is important. Therefore, it is now feasible to study the trade-off between the lower quality of shared rides and the corresponding price reduction.

Since this thesis concerns consumers in the taxi industry, there might be room for studies of the supply side of the O2O market. Taxi drivers are seeking higher profits and a larger volume of matches. At the same time, given the rate at which the industry is expanding, new entrants must seek out means to recruit more drivers in a short term.

The aforementioned research suggested that there are similarities between consumers of ride-hailing services in Australia and the United States. Conversely, this research found that there are significant differences between the consumers in the Netherlands and South Korea. Therefore, it will be meaningful to verify whether these results can be adaptable over the continent. The suggested research will enable an easier and efficient way of conducting further research on this topic.

The same research with the diverse respondent population will give a clear answer about the segmentation of the homogeneity services. Furthermore, more respondents with

diverse populations will enable the execution of the same analysis in different countries. In this research, the marketing implications were mainly based on the two countries. However, there can be further and more diverse analyses that are implementable with diverse populations.

BIBLIOGRAPHY

Alemi, F., Circella, G., Handy, S., & Mokhtarian, P. (2018). What influences travelers to use Uber? Exploring the factors affecting the adoption of on-demand ride services in California. Travel Behaviour and Society, 13, 88-104.

Automotive World. (2021, 7 May). How is ride-hailing shaping the future of mobility? Automotive World. https://www.automotiveworld.com/special-reports/shared-mobility-special-reports/how-is-ride-hailing-shaping-the-future-of-mobility/

Babar, Y.; Burtch, G. Examining the Impact of Ridehailing Services on Public Transit Use. SSRN Electron. J. 2017, 1–54. [CrossRef]

Bansal, P., Sinha, A., Dua, R., & Daziano, R. A. (2020). Eliciting preferences of TNC users and drivers: evidence from the United States. Travel Behaviour and Society, 20, 225-236.

Barriball, K. L., & While, A. (1994). Collecting data using a semi-structured interview: a discussion paper. Journal of Advanced Nursing-Institutional Subscription.

Beatty, P. (1995). Understanding the standardized/non-standardized interviewing controversy. Journal of Official Statistics

Böcker, L., & Meelen, T. (2017). Sharing for people, planet or profit? Analysing motivations for intended sharing economy participation. Environmental Innovation and Societal Transitions, 23, 28–39.

Biljecki, F., Ledoux, H., & Van Oosterom, P. (2013). Transportation mode-based segmentation and classification of movement trajectories. International Journal of Geographical Information Science, 27(2), 385-407.

Bolton, R. N., & Myers, M. B. (2003). Price-based global market segmentation for services. Journal of Marketing, 67(3), 108-128.

Brown, A. E. (2018). Ridehail revolution: Ridehail travel and equity in Los Angeles. University of California, Los Angeles.

Brown, A. E. (2020). Who and where rideshares? Rideshare travel and use in Los Angeles. Transportation Research Part A: Policy and Practice, 136, 120-134.

Brown, A. Ridehail Revolution: Ridehail Travel and Equity in Los Angeles. Ph.D. Thesis, University of California, Los Angeles, CA, USA, 2018.

Claycamp, H. J., & Massy, W. F. (1968). A theory of market segmentation. Journal of Marketing Research, 5(4), 388-394.

Clewlow, R.R.; Mishra, G.S. Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States; Technical Report UCD-ITS-RR-17-07; Institute of Transportation Studies, University of California: Davis, CA, USA, 2017.

Conway, M. W., Salon, D., & King, D. A. (2018). Trends in taxi use and the advent of ridehailing, 1995–2017: Evidence from the US National Household Travel Survey. Urban Science, 2(3), 79.

Coppola, R., & Morisio, M. (2016). Connected car: technologies, issues, future trends. ACM Computing Surveys (CSUR), 49(3), 1-36.

FAW-Volkswagen sets up a wholly-owned subsidiary for mobility service. (2021, 5 July). Gasgoo. http://autonews.gasgoo.com/china_news/70018381.html

Gensch, D. H. (1981). A practical segmentation strategy to increase ride sharing. Transportation Research Part A: General, 15(4), 331-337.

Gerte, R., Konduri, K. C., & Eluru, N. (2018). Is there a limit to adoption of dynamic ridesharing systems? Evidence from analysis of Uber demand data from New York City. Transportation Research Record, 2672(42), 127-136.

Goodwin, P., & Van Dender, K. (2013). 'Peak car'—themes and issues. Transport Reviews, 33(3), 243-254.

Herald, The Korea (2017-10-25). "Kakao launches new collective mobility app Kakao T

Hooley, G. J., & Lynch, J. E. (1981). Modelling the student university choice process through the use of conjoint measurement techniques. European Research, 9(4), 158-170.

Hyundai Motor Group. (2019, 4 december). Hyundai Motor Unveils 'Strategy 2025' Roadmap. Hyundai Motor Group News Room. https://www.hyundai.news/eu/articles/press-releases/hyundai-motor-unveils-strategy-2025-roadmap.html

Ji, S. W., Sun, X. Y., & Liu, D. (2014). Research on core competitiveness of Chinese retail industry based on O2O. In Advanced materials research (Vol. 834, pp. 2017-2020). Trans Tech Publications Ltd.

Joo, J. H. (2017). Motives for participating in sharing economy: Intentions to use car sharing services. Journal of Distribution Science, 15(2), 21-26

Kakao Mobility. (2020). *2020 Kakao Mobility Report*. brunch.

https://brunch.co.kr/@kakaomobility/58

Kim, D., Kim, K., Choe, D., & Jung, J. Y. (2017). Service issues and policy directions for promoting the O2O industry in Korea. Journal of Society for e-Business Studies, 21(4).

Kotler, P., Hayes, T., & Bloom, P. N. (2002). Marketing professional services. Prentice Hall.

Lee, E. J., & Kim, S. I. (2018). A study on user experience of Kakao Taxi. Journal of Digital Convergence, 16(9), 359-364.

Lilien, G. L., & Kotler, P. (1983). Marketing decision making: A model-building approach. Harpercollins College Division

Natter, M., Mild, A., Wagner, U., & Taudes, A. (2008). Practice prize report—Planning new tariffs at tele. Ring: The application and impact of an integrated segmentation, targeting, and positioning tool. Marketing Science, 27(4), 600-609.

Mitra, S. K., Bae, Y., & Ritchie, S. G. (2019). Use of ride-hailing services among older adults in the United States. Transportation research record, 2673(3), 700-710.

Pei, Z., Paswan, A., & Camp, K. (2020). Valuable strategy and firm performance in the O2O competition. Industrial Marketing Management, 85, 167-179.

Rayle, L.; Dai, D.; Chan, N.; Cervero, R.; Shaheen, S. Just a Better Taxi? A Survey-Based Comparison of Taxis, Transit, and Ridesourcing Services in San Francisco. Transp. Policy 2016, 45, 168–178. [CrossRef] (Rayle et al., 2016)

Research And Markets.com. (2020, June 10). Global Ride Hailing Market Report 2021: COVID-19 Growth and Change to 2030 - ResearchAndMarkets.com. Business Wire. https://www.businesswire.com/news/home/20210610005383/en/Global-Ride-Hailing-Market-Report-2021-COVID-19-Growth-and-Change-to-2030---ResearchAndMarkets.com.

Reuters. (2018, 7 February). Uber, Yandex complete ride services merger. U.S. https://www.reuters.com/article/us-uber-yandex-jointventure/uber-yandex-complete-ride-services-merger-idUSKBN1FR2IR

Sabouri, S., Park, K., Smith, A., Tian, G., & Ewing, R. (2020). Exploring the influence of built environment on Uber demand. Transportation Research Part D: Transport and Environment, 81, 102296.

Sarriera, J. M., Álvarez, G. E., Blynn, K., Alesbury, A., Scully, T., & Zhao, J. (2017). To share or not to share: Investigating the social aspects of dynamic ridesharing. Transportation Research Record, 2605(1), 109-117.

Smith, W. R. (1956). Product differentiation and market segmentation as alternative marketing strategies. Journal of marketing, 21(1), 3-8.

Sodenkamp, M., Wenig, J., Thiesse, F., & Staake, T. (2019). Who can drive electric? Segmentation of car drivers based on longitudinal GPS travel data. Energy Policy, 130, 111-129.

Söllner, A., & Rese, M. (2001). Market segmentation and the structure of competition: applicability of the strategic group concept for an improved market segmentation on industrial markets. Journal of business Research, 51(1), 25-36.

Soltani, A., Allan, A., Khalaj, F., Pojani, D., & Mehdizadeh, M. (2021). Ridesharing in Adelaide: Segmentation of users. Journal of Transport Geography, 92, 103030.

Sun, S. (2009). An analysis on the conditions and methods of market segmentation. International Journal of Business and Management, 4(2), 63-70.

Tilleman, L. Remaking the Auto Industry. In Three Revolutions: Steering Automated, Shared and Electric Vehicles to a Better Future; Sperling, D., Ed.; Island Press: Washington, DC, USA, 2018; pp. 151–166.

Triandis, H. C. (1995). Individualism and collectivism. New directions in social psychology. Boulder, CO: Westview Press.

Tong, T., Dai, H., Xiao, Q., & Yan, N. (2020). Will dynamic pricing outperform? Theoretical analysis and empirical evidence from O2O on-demand food service market. International Journal of Production Economics, 219, 375-385.

T. V. Bonoma and B. P. Shapior, “Segmenting the industrial market,” Lexington, MA: Lexington Books, 1983

Yang, Y., Gong, Y., Land, L. P. W., & Chesney, T. (2020). Understanding the effects of physical experience and information integration on consumer use of online to offline commerce. International Journal of Information Management, 51, 102046.

Yu, H., & Peng, Z. R. (2019). Exploring the spatial variation of ridesourcing demand and its relationship to built environment and socioeconomic factors with the geographically weighted Poisson regression. Journal of Transport Geography, 75, 147-163.

Young, M., & Farber, S. (2019). The who, why, and when of Uber and other ride-hailing trips: An examination of a large sample household travel survey. Transportation Research Part A: Policy and Practice, 119, 383-392.

APPENDIX 1 – INTERVIEW TRANSCRIPT (TRANSLATED)

1. Questions for consumers

1.1 How many ride-hailing applications have you installed?

Byunghyun Park: One. I have only installed Uber. Since I have been in the Netherlands for a long time, I do not need to install additional software.
Wooyoung Chae: I think that I have one. Since I have a car in the Netherlands, I do not have to use taxis or ride-hailing services in the Netherlands. Kakao T is one of the most famous application in South Korea, and I think calling a taxi is comfortable enough in South Korea.

Can Pekdemir: I think I only have one, which is Uber. When I travel, I need an app-based taxi or ride-hailing service that I can trust. However, I sometimes use Uber in the Netherlands, due to the specific service request. Uber also offer vans and you can carry pets, so it is convenient enough to use.

1.2 Why did you install the application?

Byunghyun Park: Uber is promoted well over in South Korea. I have started using Uber. Although there are several taxi services in South Korea, I did not install any other services. It is just that I do not use taxi services often in South Korea.

Wooyoung Chae: As I mentioned earlier, Kakao is good enough as a ride-hailing or app-based taxi service. Moreover, as you may noticed, Kakao is one of the biggest players in the IT market in South Korea, which means that I can easily access Kakao's related services. Last but not least, I think it has a sufficient number of taxi drivers in South Korea.

Can Pekdemir: I sometimes require a van or have special requests, and Uber is the application that offers the widest range of services. Moreover, in my case, fast matching is one of the most important criteria for app-based taxi services. In addition, Uber has the most convenient features, including price sharing. I can easily split costs with my friends when I ride with Uber.

1.3 What are your complaints when you use ride-hailing services?

Byunghyun Park: I use Uber when I am traveling in other countries. Uber's pricing is trustworthy. However, I have some complaints over matching times, especially when I am traveling in a suburban area. Moreover, in the Netherlands, matching time is sometimes longer than expected.

Wooyoung Chae: I did not think of it when I was in South Korea. Sometimes, I was annoyed by the taxi drivers, but that was not a big issue.

Can Pekdemir: Fast matching is an important factor for me. Sometimes, ride-hailing services or app-based taxi services have longer matching times than expected, especially when I need the service urgently.

1.4 What do you prefer, public transportation or ride-hailing?

Byunghyun Park: I prefer to use public transportation. Since there are heavy traffic jams in South Korea, public transportation is usually faster than taxis or ride-hailing services. In the Netherlands, however, there are some areas that public transportation does not reach. In those cases, I must use Uber. I used Uber when I needed to travel to the amusement park in Limburg. In general, I like to travel with public transportation, for the following reasons: first, easier planning; second, no traffic jams, faster in city centres; third, price is important. For Uber, if prices were to fall to 60% of their current level, I would consider using ride-hailing services often. However, prices between one and 100 euro do not really make a difference. I start to feel that it is expensive as soon as the price exceeds 100 euro.

Wooyoung Chae: I prefer public transportation. I can easily plan something. However, I think taxi or ride-hailing services are more convenient than public transportation.

Can Pekdemir: I prefer to use public transportation. I can easily plan the route based on the public transport timetable. I feel some uncertainty when I use the Uber application. For example, when I made a reservation on the day before I was due to travel through the Uber application, it was still looking for a driver in the morning. Thus, fast matching is the most important factor when I use the application.

1.5 When did you decide to use ride-hailing services? What did you consider?

Byunghyun Park: Firstly, I considered matching times. When I was in Groningen, I was waiting for a Uber, but I could not find drivers in Groningen. I feel that if I must

wait for more than 15 minutes, I should start considering alternatives. I prefer better cars with better services, but I do not actively seek out better cars.

Wooyoung Chae: I prefer fast matching. However, it was not usually a problem in South Korea. There is a high number of drivers in the country.

Can Pekdemir: Fast matching and time are two of the most important factors when I use applications. The most frustrating situations are usually the result of time pressure. Saving time is the most important factor for me. I think I can wait for a maximum of 30 minutes. However, I do not want to pay extra for fast matching because I believe that many drivers are available.

1.6 Do you feel uncomfortable when you share a car with others?

Byunghyun Park: I feel uncomfortable. If the price that I would be charged is somewhere between one and 100 euro, I would not necessarily share a car with others. However, if it is more than 100 euro, I am willing to share the car with others.

Wooyoung Chae: I do not mind sharing a car with others. As I mentioned previously, I was actively looking to share costs when using taxi services in South Korea. Thus, it would be better to share with others if I could split fares.

Can Pekdemir: I do not mind sharing a car with others. I believe that using a taxi or ride-hailing service is already more convenient than other public transport. Usually, they have more spacious vehicles and better conditions. For example, air conditioning, audio, and so on. However, as I mentioned, I am actively looking for an additional person to share costs with me. Thus, I think that it would be better to share a car with others.

1.7 What do you consider, other than fast matching? For example, do you consider the type of the car or its luxuriousness?

Byunghyun Park: When I hail a taxi in the street, I always prefer to choose newer cars. I always prefer the better car. However, I do not actively look for better cars when I use ride-hailing applications. I also do not look for luxurious cars.

Wooyoung Chae: I always prefer to be in a better car, but it is definitely not a criterion for me when I choose. A luxury car would be better, but I do not actively look for luxury cars. Budget is more important than luxury.

Can Pekdemir: Since I do have a car, I always order a specific car type, for example a van. Thus, sometimes it is important for me, but not necessarily in ordinary situations. A luxury car or a newer car are always better if the price is the same.

APPENDIX 2 – QUESTIONAIRE & SURVEY

Q1 - What is your gender?

Gender	**Respondents**
Male	23% (15 respondents)
Female	73% (47 respondents)
Other	3% (2 respondents)

Q2 - What is your age?

Age	**Respondents**
25-35	100.00% (64 respondents)

Q3 - What is your current status?

Reasons	**Respondents**
Pursuing high school diploma	0.0% (0 respondents)
Pursuing university bachelor's diploma	47% (21 respondents)
Pursuing university master's diploma	20% (30 respondents)
Graduated/employed	33% (13 respondents)

Q4 - List of Countries

Countries	**Respondents**
Australia	2% (1 respondents)
Canada	2% (1 respondents)
China	3% (2 respondents)
Denmark	2% (1 respondents)

France	2% (1 respondents)
Germany	5% (2 respondents)
Malaysia	2% (1 respondents)
Montenegro	2% (1 respondents)
Netherlands	34% (22 respondents)
Serbia	2% (1 respondents)
South Korea	45% (29 respondents)
United States of America	2% (1 respondents)
Total	100% (64 respondents)

Q5 - Which city are you currently living in?

City	**Respondents**
Amsterdam	8% (5 respondents)
Berlin	2% (1 respondent)
Busan	2% (1 respondent)
Chun Cheon	2% (1 respondent)
Copenhagen	2% (1 respondent)
Hamburg	2% (1 respondent)
Incheon	6% (4 respondents)
Jinju	2% (1 respondent)
Kuala Lumpur	2% (1 respondent)
Magdeburg	2% (1 respondent)
Montreal	2% (1 respondent)
New York	2% (1 respondent)
Nieuwegein	2% (1 respondent)
Paris	2% (1 respondent)
Podgorica	2% (1 respondent)
Rotterdam	17% (11 respondents)
Seoul	36% (23 respondent)
Shanghai	3% (2 respondent)
Sydney	2% (1 respondent)
The Hague	5% (3 respondents)
Tilburg	2% (1 respondent)
Utrecht	2% (1 respondent)
Total	100% (64 respondents)

Q6 - Have you lived in a metropolitan city? (i.e wide range of available public transportation)

Feature	Respondents
Yes	100.00% (64 respondents)
No	0% (0 respondents)

Q7 - How many transportations do you have in your city? (You can choose multiple options)

Transportation	Respondents
Bus, Metro, Taxi	9% (6 respondents)
Bus, Metro, Train	2% (1 respondent)
Bus, Metro, Train, Taxi	33% (21 respondents
Bus, Metro, Train, Tram	3% (2 respondents)
Bus, Metro, Tram, Taxi	3% (2 respondents)
Bus, Metro, Tram, Taxi, Other	6% (4 respondents)
Bus, Metro, Tram, Train, Taxi	27% (17 respondents)
Bus, Metro, Tram, Train, Taxi, other	3% (2 respondents)
Bus, Taxi	2% (1 respondent)
Bus, Train, Taxi	5% (3 respondents)
Bus, Train, Tram, Taxi	3% (2 respondents)
Bus, Tram	2% (1 respondent)
Taxi	2% (1 respondent)
Train	2% (1 respondent)
Total	100% (64 respondents)

Q8 - When do you start considering using transportation? (One-way trip)

Distance	Respondents
More than 1 km	20.31% (13 respondents)
More than 2 km	40.63% (26 respondents)
More than 4 km	28.13% (18 respondents)
More than 6 km	6.25% (4 respondents)
More than 8 km	4.69% (3 respondents)
Total	100% (64 respondents)

Q9 - Have you used ride-hailing/app-based taxi services? (i.e Uber)

Feature	Respondents
Yes	100.00% (64 respondents)
No	0% (0 respondents)

Q10 - What are the main reasons for considering ride-hailing/app-based taxi services? (You can choose multiple options)

Reasons	Respondents
No available transit	14.67% (28 respondents)
Weather	14.13% (26 respondents)
Cannot drive	13.04% (24 respondents)
Quicker than transit	20.65% (38 respondents)
Multi-tasking option	13.59% (25 respondents)
Cheaper than expected	10.33% (19 respondents)
Cost sharing	11.96% (22 respondents)

Q11 - What do you consider when you order a ride-hailing/app-based taxi services? (You can choose multiple options)

Feature	Respondents
Price	75% (48 respondents)
Matching Time	66% (42 respondents)
Convenience	58% (37 respondents)
Travel Time	56% (36 respondents)
Brand of the car	6% (4 respondents)
Others	2% (1 respondents)

Q12 - How many ride-hailing applications are installed on the smartphone?

Number of Applications	Respondents
0	10.94% (7 respondents)
1	48.44% (31 respondents)
2	32.81% (21 respondents)
3	6.25% (4 respondents)
4	1.56% (1 respondents)
Total	100% (64 respondents)

Q13 - Have you ever considered installing an additional ride-hailing application?

Additional Application	Respondents
Yes	37.50% (24 respondents)
No	62.50% (40 respondents)

Q13 – 1 - If you have said no, what are the reasons? (You can choose multiple options)

Reasons	Respondents
I am currently satisfied with the application	80% (32 respondents)
I do not think the app is cheaper than the current one that I use	10% (4 respondents)
I do not think the app has sufficient matching time	10% (4 respondents)
Others, namely,	2.5% (1 respondent)
Total	100% (40 respondents)

Q13 – 2 - If you have said yes, what are the reasons? (You can choose multiple options)

Reasons	Respondents
Alternative app would be cheaper	46.67% (14 respondents)
Current app has longer matching time	20.00% (6 respondents)
More drivers in alternative app	13.33% (4 respondents)
Additional features in alternative app	10.00% (3 respondents)

Q14 - Suppose you are going to order a ride-hailing service, how likely are you to buy it on a scale from 0 to 10?

Car type	Ordinary car
Car condition	Bad
Matching time	15 mins
Car sharing for price sharing	1 additional unknown person

Q15 - Suppose you are going to order a ride-hailing service, how likely are you to buy it on a scale from 0 to 10?

Car type	Luxurious
Car condition	Normal
Matching time	45 mins
Car sharing for price sharing	1 additional unknown person

Q16 - Suppose you are going to order a ride-hailing service, how likely are you to buy it on a scale from 0 to 10?

Car type	Ordinary car
Car condition	Good
Matching time	45 mins
Car sharing for price sharing	2 additional unknown person

Q17 - Suppose you are going to order a ride-hailing service, how likely are you to buy it on a scale from 0 to 10?

Car type	Sedan
Car condition	Good
Matching time	30 mins
Car sharing for price sharing	1 additional unknown person

Q18 - Suppose you are going to order a ride-hailing service, how likely are you to buy it on a scale from 0 to 10?

Car type	Sedan
Car condition	Bad
Matching time	45 mins
Car sharing for price sharing	0 additional unknown person

Q19 - Suppose you are going to order a ride-hailing service, how likely are you to buy it on a scale from 0 to 10?

Car type	Luxurious
Car condition	Good
Matching time	15 mins
Car sharing for price sharing	0 additional unknown person

Q20 - Suppose you are going to order a ride-hailing service, how likely are you to buy it on a scale from 0 to 10?

Car type	Luxurious
Car condition	Bad
Matching time	30 mins
Car sharing for price sharing	2 additional unknown person

Q21 - Suppose you are going to order a ride-hailing service, how likely are you to buy it on a scale from 0 to 10?

Car type	Sedan
Car condition	Normal
Matching time	15 mins
Car sharing for price sharing	2 additional unknown person

Q22 - Suppose you are going to order a ride-hailing service, how likely are you to buy it on a scale from 0 to 10?

Car type	Ordinary car
Car condition	Normal
Matching time	30 mins
Car sharing for price sharing	0 additional unknown person

Q14 – Q22 used to conduct conjoint analysis

APPENDIX 3 – TABLES & GRAPHS

Theme	Respondent	Position
Reasons for preferring taxis over ride-hailing services	Can Pekdemir	Prefers ride-hailing because it is cheaper than taxis
	Byunghyun Park	Prefers to use the application because it is cheaper in several countries
	Wooyoung Chae	Always prefers to use ride-hailing services because they are convenient and because the use of maps makes them more trustworthy
Reasons for preferring ride-hailing over public transportation	Can Pekdemir	Ride-hailing services are cheaper or as expensive as public transportation when the price is shared between several individuals
	Byunghyun Park	Prefers public transportation because it is usually faster than ride-hailing services in South Korea and the Netherlands
	Wooyoung Chae	Prefers public transportation because of its price

Table 1: Comparing ride-hailing services to other transportation services

Theme	Respondents	Illustrative excerpts
Car types and the conditions	Can Pekdemir	"Car types are sometimes important. Since I have a car, I only need specific car types."
	Byunghyun Park	"Car types are not an important criterion for me. However, I always prefer the better car."
	Wooyoung Chae	"Car condition is important, but I cannot choose when I request a service."
Luxury segmentation	Can Pekdemir	"Luxurious cars are always better. However, it depends on the price."
	Byunghyun Park	"I do not actively look for luxurious cars, but I prefer to choose a better car."
	Wooyoung Chae	"I do not actively look for a luxury car. Budget is more important."

Table 2: Key attributes of service expectations

Theme	Respondents	Illustrative excerpts
Satisfaction with ride-hailing services	Can Pekdemir	"Since I have a car, I require only a specific type of service."
	Byunghyun Park	"Trustworthiness is quite an important factor. It can be checked through the driver's ratings in the app. However, I have not seen driver's ratings below four yet."
	Wooyoung Chae	"When I was in South Korea, sometimes I was annoyed by conversations with taxi drivers."

Table 3: Service type segmentation

Theme	Respondents	Illustrative excerpts
Fast matching	Can Pekdemir	"Fast matching is important. It depends on the situation."
	Byunghyun Park	"Fast matching is always better than slow matching. However, I do not want to pay extra for fast matching."
	Wooyoung Chae	"Fast matching is often required when I use ride-hailing services."
Ideal time to match	Can Pekdemir	"Maximum of 30 minutes, considering the waiting times for alternatives."
	Byunghyun Park	"Maximum of 15 minutes; it depends on the alternatives."
	Wooyoung Chae	"Depends on the price. I do not want to pay extra for fast matching services."

Table 4: Fast matching

Theme	Respondents	Illustrative excerpts
Sharing with others	Can Pekdemir	"Matching time is an important factor for me when I use taxi services. However, on some specific occasions, I actively look for someone with whom I can split the cost."
	Byunghyun Park	"Depends on the price. Only if it is more than 100 euro."
	Wooyoung Chae	"I do not mind sharing a car with others. I sometimes actively look for someone to split the cost."

Table 5: Sharing rides

Reasons	Respondents
No available transit	14.67% (28 respondents)
Weather	14.13% (26 respondents)
Cannot drive	13.04% (24 respondents)
Quicker than transit	20.65% (38 respondents)
Multi-tasking option	13.59% (25 respondents)
Cheaper than expected	10.33% (19 respondents)
Cost sharing	11.96% (22 respondents)

Table 6: Main reasons for considering app-based ride-hailing or taxi services

Distance	Respondents
More than 1 km	20.31% (13 respondents)
More than 2 km	40.63% (26 respondents)
More than 4 km	28.13% (18 respondents)
More than 6 km	6.25% (4 respondents)
More than 8 km	4.69% (3 respondents)
Total	100% (64 respondents)

Table 7: Distance and transportation

Number of Applications	Respondents
0	10.94% (7 respondents)
1	48.44% (31 respondents)
2	32.81% (21 respondents)
3	6.25% (4 respondents)
4	1.56% (1 respondents)
Total	100% (64 respondents)

Table 8: Number of ride-hailing application installed

Additional Application	Respondents
Yes	37.50% (24 respondents)
No	62.50% (40 respondents)

Table 9: Willingness to install additional ride-hailing applications

Reasons	Respondents
Alternative app would be cheaper	46.67% (14 respondents)
Current app has longer matching time	20.00% (6 respondents)
More drivers in alternative app	13.33% (4 respondents)
Additional features in alternative app	10.00% (3 respondents)

Table 10: Reasons for installing additional application

Reasons	Groups			
	Group Reason 1	Group Reason 2	Group Reason 3	Group Reason 4
Weather	0.06	0.81	0.83	0
Cannot drive	0.09	0.94	0	0.6
Quicker	0.53	0.63	0.33	0.9
Multi-tasking	0.34	0.31	0.17	0.8
Cheaper	0.03	0.31	0.5	1
Ride sharing	0.16	0.06	1	1
No option	0.22	0.69	0	0.9

Table 11: Interpretation of results displayed via Reasons and Groups

Group	Respondents	Share
Group Reason 1	32	50%
Group Reason 2	16	25%
Group Reason 3	6	9%
Group Reason 4	10	16%
Total	64	100%

Table 12: Shares of groups.

Attributes	Groups			
	Group Attribute 1	Group Attribute 2	Group Attribute 3	Group Attribute 4
Matching	1	0	0	1
Brand	1	0	0	0
Price	1	0	1	1
Convenience	1	1	1	0
Time	1	0	1	0

Table 13: : Interpretation of results displayed via Attributes and Groups

Group	Respondents	Share
Group Attribute 1	17	27%
Group Attribute 2	12	19%
Group Attribute 3	10	16%
Group Attribute 4	25	39%
Total	64	100%

Table 14: Shares of groups

Features	Groups			
	1	2	3	4
Distance	1	6	2	8
Installed	4	3	0	1
Group Reason 1	0	0	1	1
Group Reason 2	0	1	0	0
Group Reason 3	1	0	0	0
Group Reason 4	0	0	0	0
Group Attributes 1	0	0	0	0
Group Attributes 2	0	0	0	1
Group Attributes 3	1	0	0	0
Group Attributes 4	0	1	1	0

Table 15: Segmentation based on survey findings

Segment	Respondents	Share
Group 1	16	25%
Group 2	21	33%
Group 3	24	38%
Group 4	3	5%
Total	64	100%

Table 16: Segmentation and shares

Reason	Mean		Standard Deviations		t-value	p-value
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
No option	0.2069	0.7727	0.41225	0.42893	-4.771	<.001
Weather	0.3103	0.6818	0.47082	0.47673	-2.776	0.008
Cannot drive	0.3103	0.5909	0.47082	0.50324	-2.046	0.046
Quicker	0.6552	0.5909	0.48373	0.50324	0.462	0.646
Multitasking	0.4483	0.3182	0.50612	0.47673	0.932	0.356
Cheaper	0.069	0.5909	0.25788	0.50324	-4.442	<.001
Ride sharing	0.1724	0.5	0.38443	0.51177	-2.512	0.016

Table 17: Comparison with the reasons

Classified Reasons	Mean		Standard Deviations		t-value	p-value
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
Group Reason 1	0.59	0.18	0.501	0.395	3.223	0.002
Group Reason 2	0.2759	0.2727	0.4549	0.45584	0.024	0.981
Group Reason 3	0.1034	0.3636	0.3099	0.49237	-2.173	0.037
Group Reason 4	0.0345	0.1818	0.1857	0.39477	-1.62	0.116

Table 18: Comparison with classified reason classifications

Attributes	Mean		Standard Deviations		t-value	p-value
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
Matching	0.7586	0.7273	0.43549	0.45584	0.25	0.804
Brand	0.0345	0.1364	0.1857	0.35125	-1.338	0.187
Price	0.6207	0.9091	0.4938	0.29424	-2.596	0.019
Convenience	0.3793	0.6364	0.4938	0.49237	-1.843	0.071
Time	0.2414	0.9091	0.43549	0.29424	-6.524	<.001

Table 19: Comparison with attributes

Classified Attributes	Mean		Standard Deviations		t-value	p-value
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
Group Attribute 1	0.1724	0.4545	0.38443	0.50965	-2.17	0.036
Group Attribute 2	0.2414	0.0455	0.43549	0.2132	2.112	0.041
Group Attribute 3	0	0.2273	0	0.42893	-2.49	0.021
Group Attribute 4	0.5862	0.2727	0.50123	0.45584	2.33	0.024

Table 20: Comparison with classified attributes

Segment	Mean		Standard Deviations		t-value	p-value
	South Korea (n=29)	The Netherlands (n=22)	South Korea (n=29)	The Netherlands (n=22)		
Group 1	0.6207	0.1818	0.4938	0.39477	3.526	<.001
Group 2	0.2759	0.3636	0.45486	0.49237	-0.66	0.513
Group 3	0.069	0.1364	0.25788	0.35125	-0.79	0.433
Group 4	0.0345	0.3182	0.1857	0.47673	-2.64	0.014

Table 21: Comparison with segmentation

Attribute	Level
Car types	Luxurious car
	Sedan
	Ordinary car
Car condition	Good condition
	Normal condition
	Bad condition
Matching time	15 mins
	30 mins
	45 mins
Ridesharing	0 additional strangers
	1 additional stranger
	2 additional strangers

Table 22: Conjoint attributes and levels

Test	Value
Pearson's R	< 0.001
Kendall's tau	< 0.001

Table 23: Reliability of the orthogonal choice sets

Attribute	Average Importance Value
Type	9.549
Condition	19.832
Matching	58.578
Sharing	11.962

Table 24: Average importance value

Attribute	Importance	Level	Estimated Utility
Car type	10%	Luxurious car	0.231
		Sedan	0.019
		Ordinary car	-0.250
Car condition	20%	Good condition	0.295
		Normal condition	0.353
		Bad condition	-0.647
Matching time	59%	15 mins	1.443
		30 mins	0.072
		45 mins	-1.515
Ridesharing	12%	0 additional strangers	0.173
		1 additional stranger	-0.388
		2 additional strangers	0.215

Table 25: Conjoint analysis

Attribute	Level	Est. Utility KR	Est. Utility NL
Car type	Luxurious car	0.374	-0.015
	Sedan	0.053	-0.030
	Ordinary car	-0.428	0.045
Car condition	Good condition	0.399	0.106
	Normal condition	0.350	0.273
	Bad condition	-0.749	-0.397
Matching time	15 mins	1.597	1.167
	30 mins	-0.107	0.394
	45 mins	-1.490	-1.561
Ridesharing	0 additional strangers	0.263	-0.015
	1 additional strangers	-0.453	-0.318
	2 additional strangers	0.189	0.333

Table 26: Comparison of results from the Netherlands and South Korea

Type	Features
Uber X	Low-budget, affordable rides
Uber Comfort	More recent car models with high-rated drivers
Uber Black	High-end cars with high-rated drivers

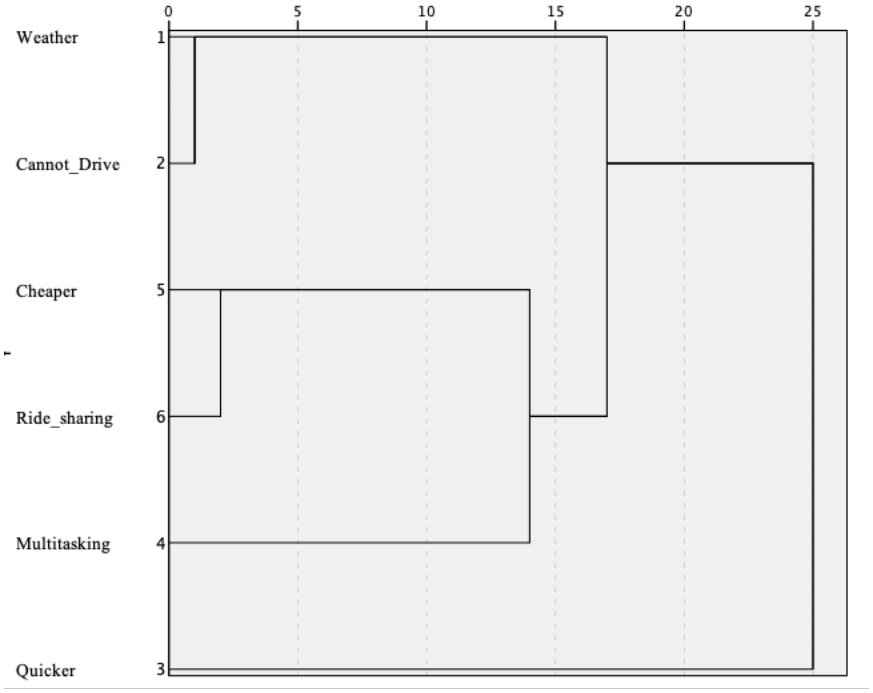
Table 27: Current segmentation of Uber in the Netherlands

	Travel Distance	Transportation	Key reason	Matched segment
Group 1	Shorter travel (1 km)	Frequent users	Efficiency	Uber X
Group 2	Longer travel (6 km)	Frequent users	Efficiency	Uber X
Group 3	Longer travel (2 km)	Frequent users	Cannot drive, weather	Uber X
Group 4	Longer travel (8 km)	Infrequent users	Need-based	Uber X/Uber Comfort/Uber Black

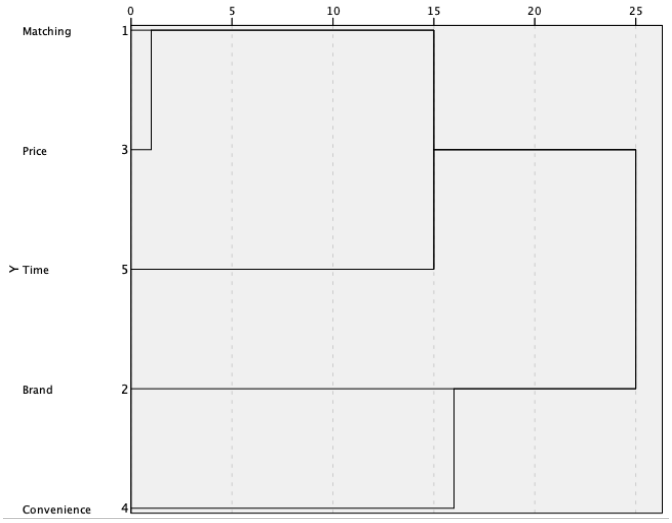
Table 28: Suggested segmentation

Levels	Description			
		New Entrants	Current Market Player	
Understanding consumer	Market Players	Automotive manufacturers	Current Ride-hailing services	Traditional Taxi services
	Example	FAW-Volkswagen	Uber	Current taxi services
	Current Consumers	Not Applicable	Group 1, Group 2, Group 4[4]	Group 1, Group 4
	Current Consumer Characteristic	Not Applicable	Need based, frequent travelers	Need based, mixed up with frequent travelers and infrequent travelers
	Potential Consumers	Group 1, Group 2, Group 3, Group 4	Group 3	Group 3
	Potential Consumers Characteristic	Need based, who are familiar with public transportation	Need based, price lovers	Need based
Current Consumer Strategy	Pricing	Reducing prices based on the new available features	Reducing prices based on collected data	Do not required to reduce the prices
	Promotion	Promotion plans to acquire both current consumers and targeting the Group 3 consumers	Promotion plans to keep the interest on the applications	Promotion plans to keep interest of the current consumers.
	Quality Improvement	Improve the ride-sharing feature and autonomous driving features	Develop mile to mile application	Needed to be stay as the top transportation method
Potential Consumer Strategy	Pricing	Reducing prices based on the additional possible features	Reducing the prices based on current data collection	Might need to reduce the prices to follow the trend
	Promotion	Promotions for the new users.	Suggesting based on the weather conditions	Promotions based on the additional feature
	Quality Improvement	Developing features that can be convenient based on the ride-sharing feature	Developing features about time accuracy, and estimations.	Focus on the current development to find additional conveniences to the its competitors

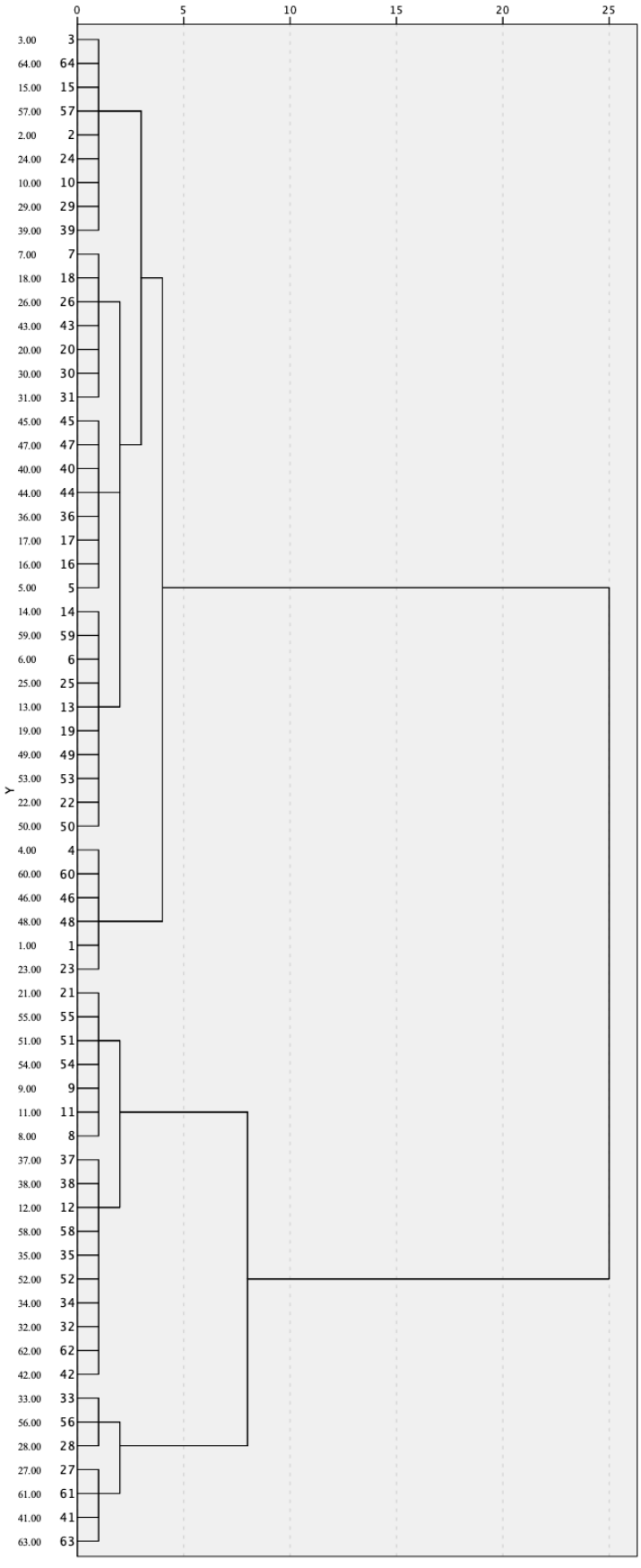
Table 29: Summary of marketing implication



Graph 1: Dendrogram used to cluster reasons for using ride-hailing or taxi services



Graph 2: Result at the centre of the attributes cluster



Graph 3: Dendrograms using Ward's method

$$U_i = \beta_0 + \sum_{t=0}^{p_1} \beta_{1t} X_{1t_i} + \ldots + \sum_{t=0}^{p_a} \beta_{at} X_{at_i} + \varepsilon_i$$

$$(P_j = 2, i = 1, \ldots, n, j = 1,2,.., a)\ ,$$

U_i : $average\ utility$;

β_0 : $constant\ term$;

X_{1t} : $indicate\ attribute$;

ε_i : $error\ term$,

Equation 1 : Models for estimating average utility of key attributes