Implementation of packaging delivery services in public parking garages

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IMPLEMENTATION OF PACKAGING DELIVERY SERVICES IN PUBLIC PARKING GARAGES

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Summary

This thesis is about two subjects that are causing several problems in western world cities. The first subject concerns online shopping delivery problems. The second subject is about the problem of a vacant parking garage in inner-city areas. Thereby, we would like to investigate the connection between those two subjects through a study of the possibility to offer Packaging Delivery Services (hereafter PDS) in a Public Parking Garage (hereafter PPG).

Worldwide online shopping is growing rapidly which leads to a growth in packaging delivery orders. Package delivery companies have difficulties to deliver packages to the customers at home. In addition, to this, it appears to be one of the most expansive delivery methods. One of the obstacles is that often there is no one at home when a package arrives. Therefore, a package needs to be sent back to a distribution center, which causes the package a delay in delivery and often customer frustration. The more delivery orders there are, the more delivery vans enter residential streets and the growing amount of vans cause more and more congestion and pollution in cities.

Worldwide, cities are dealing with a growing population. This leads to overcrowded cities. Also, the attractiveness of the cities leads to more visitors and residents. This results in more traffic and more vehicles on the streets. The growing number of the vehicle causes more congestions and pollution in the cities and lowers the livability level for residents. Municipalities are trying to keep the livability in the center of cities comfortable. One of the goals is to have better environmental conditions in cities and to stop the increase in air pollution. Therefore, municipalities are using different measurements, such as not allowing vehicles in their center and directing cars to parking facilities at the fringe of the city. According to some literature and trends, it is possible to conclude in an increasing number of vacant parking garages in city centers. This is mainly because of those measurements. Therefore, additional research is needed to find possible solutions for the problems of increase package delivery and vacant garages.

The two mentioned subjects can be connected by looking at one solution: providing PDS in PPG. For this thesis, a literature research is done with respect to PDS and PPG. Due to a lack of reliable data and articles for this thesis, it is decided to carry out a survey. This survey is performed to investigate the possibilities of PDS in PPG, and to measure customers' willingness to make use of PPG as PDS. The survey was taken online. Thereby, respondents were asked a few questions about their experience with online shopping. For example, how often one orders something online and what type of goods it concerns. Additionally, some personal questions were asked, such as age, gender, and postcode. This information was needed to analyze the respondents and to know if they are representative of the Dutch population. Additionally, it was also important to analyze the possible differences in preferences between different groups of respondents. For example, to see if there is any difference between males and female, or younger and older respondents.

The third part of the survey was about the personal preferences of the respondents. This is the most important part of this research. In this part, respondents were asked to evaluate a

combination of package and parking garage represented by eight attributes. Four of the eight attributes are package related and four are parking garage related. The attributes were retrieved from the literature study. The package related attributes are the value, the shelf life, the size, and the weight of a package. The parking garage attributes are the travel time between home and PPG, opening hours of PPG, time of free parking, and presence of assistance at the parking garage. The attributes are put together in combinations of package and parking garages that are evaluated by respondents by indicating the likeliness of usage on a four-level scale: very unlikely, unlikely, likely, and very likely.

The survey gave for each attribute a clear view of estimated values. Those estimates represent the probability that people will choose for a packaging delivery service at parking garage instead of home delivery. In this case, it means to have their package delivered in PPG that can be considered as a delivery point. For this survey, a stated preference experiment is used as it is about personal preference and can include none existing services. The preferences are analyzed using ordinal regression analysis.

The result of this survey is that not all included attributes are significant. The significant attributes vary in the level of estimation value. The estimations also vary per different group. Finally, 5 out of 8 attributes were significant for the respondents. Four out five of those attributes have a negative effect on the decision of respondents to use the PPG as PDG. Package value, package size, and package shelf life are the negative effect attributes. Travel time to parking garage has also a negative effect on the decision. The attribute opening hours of the parking garage is the only significant attribute that has a positive effect on the decision to use a PPG as PDG. However, when the data set was cut into different groups of respondents, the results were slightly different. The biggest difference was found for people who live outside the Randstad and in less urban density area. For those groups the presence of personal assistance at parking garages is important. This attribute has a positive effect on their decision. In addition, the group of bachelors educated and lower find the weight of the package of 10 kilograms essential as it has a slightly negative value on the decision making.

Ordinal regression analysis revealed that people are more willing to make use of PDS in PPG (30%) instead of having package delivered at home. This seems not that much, however in compared with the current situation (only 10% of all people are making use of PDS), 30% seems to be very good value for the future perspective of PPG as a PDS. Additionally, with the found attributes of this research, it is possible to influence the willingness of the people to make more use of PDS in PPG instead of home delivery.

Implementation of PDS in PPG can lead to four positive effects. The first effect is that it avoids unnecessary customer's frustration of not (timely) delivered packages. The second effect concerns the time and money savings for PDS organizations by preventing delivery delay. The third effect concerns the decrease of traffic movements in (residential) roads by delivery service vans and so reducing pollution in cities. The fourth possible effect can be the multiple usages of a parking garage. In addition, making a PPG more attractive and functional place for everyone.

Abstract

Technological developments and a growing population in cities caused many positive and negative effects. This graduation study is based on two of those effects. The first effect is a growing packaging delivery service (PDS), because of online shopping that results in many delivery vans are on the streets. The second effect the measurements taken by the government in order to reduce the growing number of vehicles on the streets in the center of cities. These measurements lead to vacant public parking garages (PPG). Those two effects have an overlapping part. The overlapping part is to use PPG as an extra service point for packaging delivery. Since PPGs are not used for PDS (services), a survey was conducted to indicate the willingness of using this service. A stated preference (SP) method has been used. Traditionally, this method contains attributes where respondents are asked to indicate choose the willingness of use. In this survey, we have tested the attributes that can influence people's willingness to use PDS in PPG.

The eight attributes are included four PPG and four package attributes. The survey revealed that five of these attributes are significant, four of which have a negative effect. Those are package value, package shelf life, package size and travel time to the closest PPG. On the other hand, the attribute regarding the opening hours is the only significant one with a positive effect. Furthermore, the attributes of the package weight, free parking, and assistance are not significant in this study. Additionally, the respondent's data was divided to analyze the differences between groups and their preferences. There are some differences between the total model and the model that was estimated per groups. The biggest outlier is found in the group people that live in less density areas. This group finds the personal assistance significant and have a positive value on the willingness estimation to make use of PDS in PPG.

List of abbreviations/Glossary

PDS – Packaging delivery service

PPG – Public parking garages

CBS – Central Agency for Statistics in the Netherlands

SP – Stated preference experiment

RP – Revealed preference

DCA – Discrete choice analysis

SPSS – Statistical Package for the Social Sciences

GIS – Geographic information system

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1. Introduction

The goal of this research is to find out the willingness of the online shopping customers to make use of Packaging Delivery Services (hereafter referred to as PDS) that can be provided in a Public Parking Garage (hereafter referred to as PPG). The market of PDS in the Netherlands is described by Authority Consumer & Market 'Autoriteit Consument & Markt' in the report Market Scan Packages 'Marktscan Pakketten' (ACU, 2016). This report was written by an independent body that stands up for consumers and businesses in the Netherlands. The report is one of the few reports that present an independent research about the packaging delivery market from a commercial perspective including the four biggest packaging delivery companies in the Netherlands. Those are PostNL, DHL Parcel, DPD, and GLS. Additionally, those companies have been compared on many aspects like package delivery, service, market structure, and market behavior. However, the 'Marktscan Pakketten' (ACU, 2016) report did not mention the issues from the customers' point of view. The customers do have an opinion on this topic and they are also a very important part of the packet delivery circle chain. Therefore, it is also important to have a research done from the perspective of customers.

The research presented in this thesis is based on two subjects. The first subject concerns the increase in delivery vans in residential streets due to the growth of online shopping and home delivery. Those vans pollute the air in the cities and cause congestion (Moroz and Polkowski, 2016), (Visser, Nemoto and Browne, 2014). The second subject concerns the growing need for parking space for cars in inner cities due to the population growth and the unsure future of parking garages due to government regulations (Rijksoverheid, 2018), (Structuurvisie Infrastructuur en Ruimte, 2012). That leads to more vacant parking spaces in PPG of inner cities (Khreis et al., 2017). Those regulations aim to decrease car use and to make the center of cities more pedestrian and bicycle friendly. Therefore, this thesis researched the commonality of those two subjects and presents analysis on peoples' behavior and willingness to have delivered their package in the parking garage rather than at home.

The approach of this thesis has three positive effects. The first effect is that it avoids unnecessary customer's frustration of not (on time) delivered packages (CBS, 2016). The

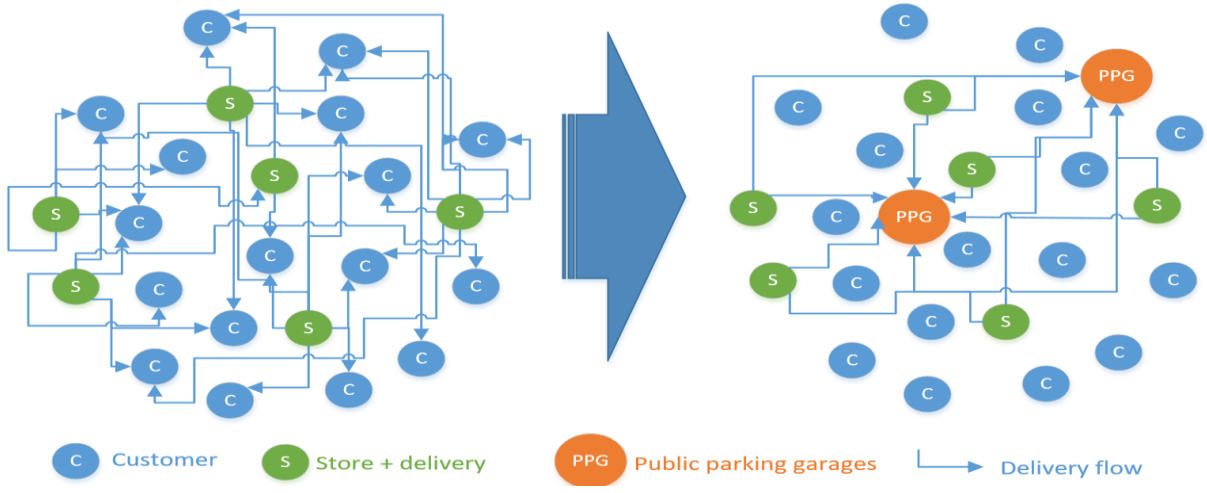


Figure 1. Decreased traffic flows as an effect of added extra service to PDS via PPG

second effect concerns the time and money savings for PDS organizations by preventing delivery delay, and the third effect concerns the decrease of traffic movements in (residential) roads by delivery service vans as present in Figure 1.

1.1. PROBLEM DEFINITION

To clarify the problems of the two subjects mentioned above is a literature research needed. However, much of the research up to now has been descriptive in nature of stimulation of customers delivery behavior. Therefore, an additional survey is done to analyze online shopping behavior, that is explained in next paragraph 1.3. As a small change in the current delivery chain can make a difference. In this case by adding an extra pickup/drop-off point into the packaging delivery chain, like a public parking garage (PPG), providing the last link between the packaging delivery service (PDS) and the customers. So, the customers can decide for themselves when and where they like to pick up the delivered package (Essen, 2013).

Photo 2. Overcrowded helpdesk with packages at a Post office in Eindhoven (own work, 2018)

Customers can choose if they like to have the package delivered at home, which results in waiting home until the package will arrive. It might also be that the package will not arrive that day or it might arrive at a time that the customer is not home. So, they are taking a delivery risk not being home, that can result in a delivery delay (Essen, 2013). The packages that are not received by the customers directly need to be sent back to a distribution center and the last delivery step needs to be done over again. The efficiency of packaging delivery causes the biggest frustration of customers (Iwan et al., 2016).

Additionally, this development results in more vans driving in and out of the cities creating more unwanted traffic in cities (Allen et al., 2017). Based on the previous researches and literature, more research needs to be done to find the factors that cause those problems and the possible solutions to those problems. As there are many factors that can influence the causes this research is delineated, this is furthermore explained in the next paragraph 1.2.

1.2. RESEARCH FOCUS

The focus of this thesis is to research literature studies related to parking garages and online shopping and a possible overlapping between those two subjects. Those two subjects are analyzed in five different perspectives with a focus on potential customers, as mentioned in Figure 2.

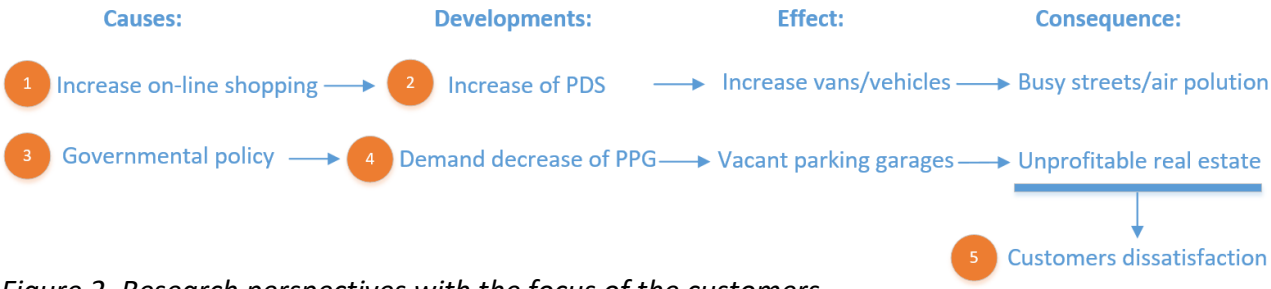


Figure 2. Research perspectives with the focus of the customers

1. The first perspective concerns fast-growing online retailers like Zalando, Amazone, BOL.com, Alibaba, and Wehkamp. All of these companies are growing rapidly, due to the fast increase in online shopping in the Netherlands (CBS, 2017). The increase in online shopping in all countries of the EU is even higher than in the Netherlands (CBS, 2017). For example, Wehkamp started the construction of a second distribution center at the business park Hessenpoort in Zwolle in early 2018. It will be an extension of the existing distribution center. This will increase the package process capacity by more than 200,000 customer orders per day (Bayraktaroglu, 2018). A second example is related to UPS in Eindhoven that is realizing an automated sorting center with an area of approximately 31,500 m² (Blauw, 2017). Companies do not want to lose their customers; therefore, they deliver their packages themselves, which reduces the pressure on delivery companies, which in turn may increase the traffic flow in (residential) streets even more.
2. The second perspective is related to the Packaging Delivery Services (PDS) companies. In more detail, attention will be paid to the problems they are facing now and in the near future. Some companies in this field are PostNL, GLS, DHL, DAS, PNR, and UPC. For PostNL, packaging delivery continues to grow in the Netherlands and abroad (ANP, 2017). DHL delivered 75 million packages in 2017, 40% more than a year before. Overall the packaging delivery is increasing very fast in the last decennia due to online shopping (NOS, 2015). This development is causing many problems. Former post offices are fully booked with packages and this causes a need for a huge amount of space and time to hold packages until the customers come to pick them up. Due to the frustration of customers that packages are wrongly delivered, long waiting for a package, or that packages are not delivered at all. Many retail companies are starting their own delivery service to satisfy customer needs and to meet the growing demand for packaging delivery services, to provide better service (Brandsema, 2017). This causes even more traffic.
3. The third perspective relates to government institutions because they are involved in both developments as well. The government of the Netherlands is responsible for national, regional, and local spatial interests by looking at, for example, the development of economically important areas, safety, livability, and the quality of the environment (Rijksoverheid, 2018). The government's priorities on this matter are to invest in spatially

connected developments and infrastructure. One of the priorities is stimulating the reduction of car use in the cities (Structuurvisie Infrastructuur en Ruimte, 2012). That causes a direct effect on livability and mobility in the cities. Therefore, the government is an important influential factor in this issue. The solution that is described in this report, using PPG for PDS purpose, can decrease the traffic flows in a city and in addition, can have a positive effect on livability ranking occupancy. Therefore, it is important to know what the point of view is of the government about those developments, wherefore the research could have a positive outcome for improvement.

4. The fourth perspective is looking at administrators and owners of the public parking garages (PPG). The PPG usually faces an average of 20-30% of vacant parking spaces (Molen, 2010). Over the period 2008-2012, the average number of parking hours that were sold has decreased by 10% per year (Bekkers, 2013). Additionally, according to Deloitte (2017) 'Smart mobility' is also a trend that may decrease parking demand, due to development of smart mobility, like car share and self-driving cars (Van den Berg et al., 2017). This trend is briefly described in the thesis, as mentioned in paragraph 2.3.
5. The fifth and the last perspective includes the potential customers and their social environment (neighbors). The increase in online shopping leads to high packaging delivery logistics that many delivery companies have difficulties to maintain, which leads to customers dissatisfaction (LogistiekProfs, 2016). In 2010 90 million packages were delivered. That number grew to 190 million in 2014, the trend of 8% growth per year continues. Consumer Advice calculated that British consumers experienced around 4.8 million 'delivery problems' in 2015 and 2016. Solving a problem took in an average of 2.5 hours per customer (Citizens Advice, 2016). Four out of the ten customers in the Netherlands (42%), had a delivery problem. The main problem was the late delivery of a product or a package, this covers 23% of all the cases in 2015 and in 2016 (CBS, 2016). In 2013, the number of packages that package deliverers should deliver to consumers grows to 120 million. Counting all the delivery companies in the Netherlands, more than 90% of all packages are delivered home and the rest at a service point (Marktscan, 2016). Only 35% of the customers are at home at a moment that package is delivered, sometimes a package can be left at the neighbors. However, often is not the case, so the package needs to be sent back (Essen, 2013).

Additionally, emissions of CO2 are 44 grams per consumer trip to a local depot to collect a missed delivery (Edwards et al., 2009). This trip has a negative effect on the increasing pollution level. The World Health Organization (WHO) has pointed out that polluting emissions from engines are responsible for 75,000 premature deaths in Europe every year (Edwards et al., 2009). This problem is taken very seriously by the government, therefore, there are measures taken to reduce that effect. Below are a few examples of European projects that implemented developers and governance programs that led to decrease car usage (Gavaldón, 2018), moreover are more examples described in paragraph 2.3.2.

In Amsterdam, there are some projects where car use is limited to 'De Vrije Kade' (De Vrije Kade, 2018). The goal of this project is to create neighborhoods where cars are not allowed. Also, in Eindhoven, there is a neighborhood 'Strijp S' that limits car use, the inhabitants have very limited to no space for a car (Strijp S, 2018). Paris wants to ban all cars with traditional

combustion engines from its streets by 2030, rue de Rivoli by 2024. Antwerp and Brussels have introduced a low emission zone (LEZ) started from 1 February 2017. From 2020 these standards will become increasingly higher. London has The Congestion Charge to enter a city by a car that costs £11.50 per day per vehicle. Nottingham a major UK city implemented a workplace parking levy (WPL) to constrain congestion and to improve public transport (Frost and Ison, 2009).

1.3. RESEARCH QUESTIONS

The two developments of increasing packaging delivery and decreasing parking space that is mentioned before causes problems that are closely related to citizens' choices and their packages delivery behavior. Therefore is important to find out the attributes that influence their choice behavior. Those attributes can be for example time or place related. It is important to analyze the attributes that are related choice behavior and analyze wherever it makes sense to provide PDS in a PPG. The focus of this research is on the end-users of PDS who also the customers of PPG can be. The main research question is:

What are the attributes of Package Delivery Services (PDS) and Public Parking Garages (PPG) that stimulate customers to use PDS provision in PPD?

To organize and to have a good scope about problems and the possible solutions, it is important to know where those problems are coming from. Therefore, some background information is needed. This can be found through a review of the literature and customers preferences choice behavior survey. To have a visible and structural scope for this, there are some sub-questions defined:

1. *What is packaging delivery service (PDS)?*
2. *Which attributes are related to customers behavior?*
3. *What are public parking garages (PPG)?*
4. *Which attributes of PPG are related to customers behavior?*
5. *How to collect, organize the respondent's preferences related to PDS and PPG?*
6. *How to analyze the survey data?*

The first four sub-questions are answered in chapter 2. The sub-question 3 and 4 are answered in chapter 3 together with the survey output that answers the main research question. After answering those questions there are some conclusions and discussion is made in chapter 4.

1.4. RESEARCH DESIGN

This section describes the research approach that is used by a mixture of qualitative and quantitative methods. To answer the above-mentioned research questions, a research approach method is made and used as explained below. The research approach is presented in a framework and visualized in Figure 3. Thereby is it very important to consider that the focus of this research is respondents preferences; this step is included in phase 4 'Survey'.

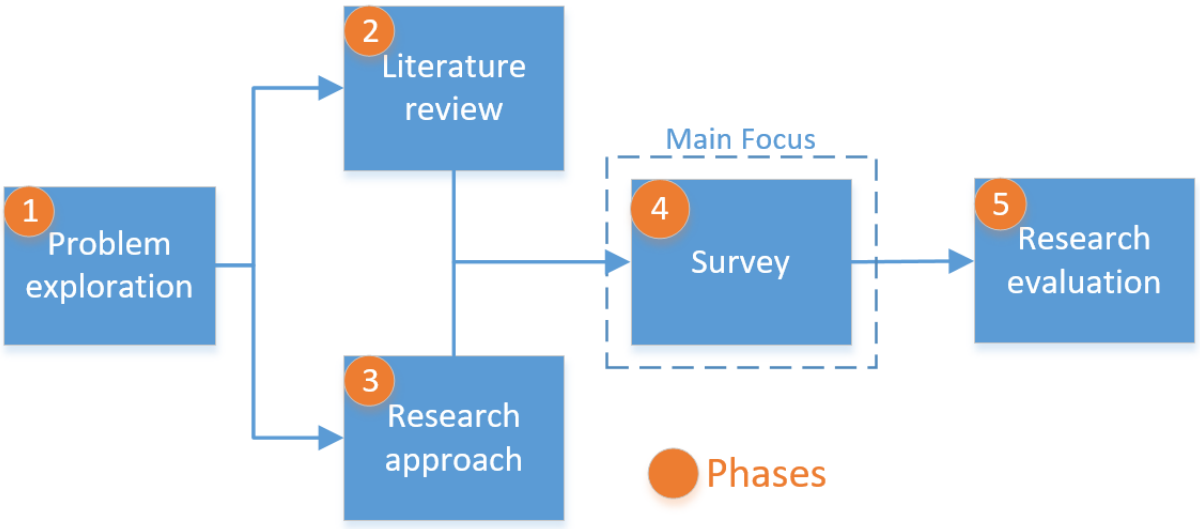


Figure 3. The research design

The following steps are considered:

1. Problem exploration

The first phase of the research concerns problem exploration. This step is partly described in paragraphs 1, 2 and 3 of this chapter: describing the research purpose, problem, goal, and the research question.

2. Literature review

To find the answers to the research question, the research approach contains a 6 phases method. The literature study implies the use of PDS and PPG that needs to be captured to get the maximum insight into the problem and the solutions that already exist or will be applied in near future.

3. Research approach

After doing the literature research, a survey will be set up and distributed. The focus of the research is the customer willingness and the added value of PDS in PPG. According to the book by Hensher et al. (2005), there are eight stages that need to be followed by setting up a stated choice experiment. Those stages are most beneficial for this research. The stages after the fifth stage are aimed at finalizing the SP experiment and to make a questionnaire for potential users. The last three stages are not within the scope of this research. The used five stages are Stage 1: Problem definition refinement, Stage 2: Stimuli refinement, Stage 3: Experimental design considerations, Stage 4: Generating experimental designs, Stage 5: Allocating attributes to design columns, Stage 6: Generate choice set, Stage 7: Randomize choice set, and Stage 8: Construct a survey instrument. All those stages and the significance of those are comprehensively mentioned in paragraph 3.3.2.

The eight stages mentioned above will be used during the thesis research and filled in with the information that is collected from the literature research and the interviews that are held.

After the data are collected with the questionnaires, the data can be analyzed. The data will give the needed information for the next step, which is to apply the gathered data into the GIS software for visualization of the possible solution on a map. The final step is to base conclusions on the analysis and to write the discussion.

Revealed preference (RP) data represent preferences that are based on actual situations. *''Revealed preference data represents data collected on choices that are made''* (Hensher et al., 2005). Stated preference (SP) is an imaginative preference that is derived from hypothetical/imaginary situations that are based on a selected set of attributes.

The next difference between the two methods concerns the number of observations obtained from the data collection. "*With SP data, respondents are usually shown multiple choice sets, each of which has different attribute levels (and possibly even different alternatives present, depending on the design). Thus for each respondent, we gain multiple observations over the number of choices sets completed. RP data, however, usually provide the analyst with information about the single choice that was made."* (Hensher et al., 2005,).

Since the approach presented in the research problem does not commonly exist yet, the choice in this research is the SP method. This allows creating a link between what people prefer and what are the things that directly influence their preference.

The chosen method is based on the product/service that does not exist yet. Based on the SP, it is possible to make suggestions about the characteristics that make a PPG attractive for PDS use. By defining dependent and independent attributes and vary them in the research which will be investigated during interviews and questionnaire. Based on the attributes and attribute levels, the alternatives are defined. This resulted in several alternatives that respondents need to evaluate. Based on the answers of the respondents, the necessary attributes are analyzed that later could be used in a GIS-based study case.

4. Survey

For this research, there is a survey conducted. This is described in the fourth phase of the research method, as mentioned in paragraph 3.5.1 'Survey'. This survey will give an insight into the current situation of the market from a professional perspective of the stakeholders and a personal perspective of the potential customers. That perspective is needed for additional information on relevant attributes that can be used in the stated choice experiment later. Originally the idea of this research was to make a visual in a GIS model based on the founded attributes. Unfortunately, due to a time constraint, it was impossible to implement it. However, the findings of the needed and significant attributes can still be used for further research.

5. Research evaluation

Finally, having the main research question answered and all the needed information collected, the conclusions and the discussion will be held at the end of the research. Additionally, this research has some limitations that need to be addressed and taken into account in further investigation on literature. The next paragraph captures those limitations.

1.5. LIMITATIONS

The objective of this research is to find out if customers are willing to make use of PDS provided in a PPD and to identify what makes it attractive to make use of it. In order to reach this objective, a clear scope needs to be defined to not lose focus. Therefore, the following limitations are applied:

- The research only focuses on public accessible parking garages that are near inner-cities.

- The research will not provide detailed information about the organization of packaging delivery companies because of the given circumstances of oligopoly and competition between packaging delivery companies.

- The research does not focus on packages that should be delivered at home, like food packages. The same holds for packages that are bigger than 176 x 78 x 58 cm (those are general package rules of PostNL) and heavier than 15 kg, packages like furniture. Also, packages that can fit into a mailbox and do not have to be personally accepted by the customer (with signature), also are not considered.

Additionally, there are more things that could be researched for this problem, like the efficiency of PDS (PDS related problems) and technical opportunities of PPG (PPG related problems). Those are the problems that the research will **not** be focusing on. The only market-related problem from the customer's point of view (Customer related problems), examples are shown in Table 1.

Table 1. Examples of insights problems

PPG problems	PDS problems	Customer problem
Are the PPG suitable to save packages?	Is it efficient to use parking garages for PDS?	What are the things that make PDS possible in PPG?
What are the right entry and exit for customers?	What are the things that PDS expect from distribution point?	How long should the packages be saved before the customer will pick it up?
What are the delivery possibilities of packages?	Do they willing to pay for the service?	Are the potential customers willing to pay for the service?

This research is not focusing on the technical and efficiency problems, but a step ahead. Are there any needs from the customer's perspective? Is it practical for customers and are they willing to make use of it, and if so, what are the attributes that make PPG attractive and what are the circumstances would the customer make use of it? So, before filling in the technical and efficiency problem, it is important to know if there is a market.

1.6. SCIENTIFIC IMPORTANCE

The scientific contribution of this thesis is to gain insight into customer willingness to use public parking garage that provides packaging delivery service as storage. Additionally, some attributes have analyzed that influence the customer's preferences through decision making. Based on those preferences it should be possible to predict and to manage customers

behavior by using those attributes. This gives a deeper understanding of the preferences people are having regards PPG and PDS. More data information would help to establish a greater degree of accuracy on this matter. Therefore, companies or governance can use these attributes to use it in their decision making.

1.7. READING GUIDE

This research thesis is divided into four chapters. The first chapter presents the introduction, the problem and the limitations of this study. In the second chapter, the literature review is presented and discussed to get a better perspective on the problem and the research that has already been performed on this matter. The third chapter presents the research approach and the methodology used in this research, clothing with the survey analyses results. The fourth chapter presents conclusions based on all previous chapters, enclosing with the discussion, recommendation, and scientific relevance.

2. Literature review

In this chapter, the relevant literature and previous studies are described for both subjects, PDS and PPG. Each subject is studied independently and divided into two paragraphs. In paragraph 2.2 all the relevant literature is summarized about packaging delivery service in the Netherlands and what are the trends concerning this subject. Additionally, in paragraph 2.3 the relevant literature studies about the PPG in the Netherlands are described.

2.1. INTRODUCTION

This thesis we consider to research two subjects. The first subject is packaging delivery service (PDS) in the Netherlands and the second subject is public parking garages (PPG). Both subjects are actual, relevant, and are international topics. Worldwide governments and companies are trying to find solutions and approach for those subjects (Amador et al., 2014). Solutions and approaches for fast-growing online shopping that leads to some negative sequel like congestions and delivery delay (Iwan et al., 2016). Likewise, solutions and approaches for pretending vacant parking garages in the cities and encourage better living conditions for residents (Ison and Mulley, 2014).

2.2. PACKAGING DELIVERY SERVICE (PDS)

There are many types of research done regarding the different types of packaging and the delivery options for the customer, e.g. (Moroz and Polkowski, 2016), (Ballin, 2018), (Visser, Nemoto and Browne, 2014). Those studies are describing the actual problems in delivery systems and packaging delivery methods in the western world. There are studies done to have a scope of the problems and the complicated processes behind it. Therefore, there are only a few methods that make the packaging delivery a bit easier, or environmental and customer friendly. In existing sources like journals and researches, there is some vagueness about different kinds of posts delivery. Figure 4 shows a summation of the delivery methods to overcome the problem of the *last mile delivery*: classical solutions versus collecting points made by Maroz and Polkowski (2016). The last mile delivery is the last step in the packaging delivery process to the customer.

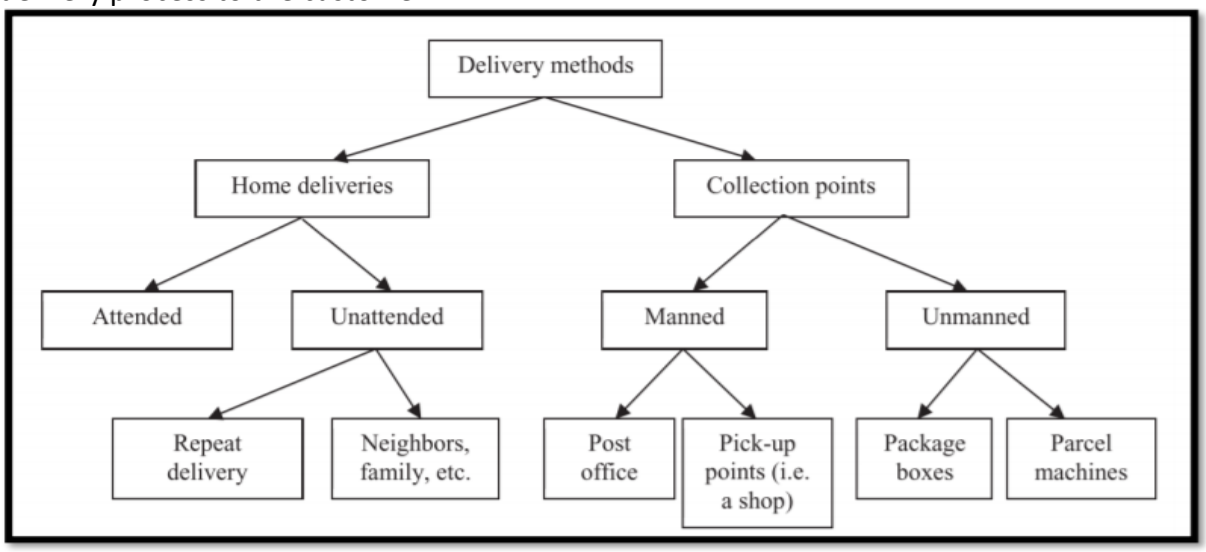


Figure 4. Classical solutions versus collecting points (Moroz and Polkowski, 2016)

There is limited scientific research done about the packaging delivery and the preference that customers have to this respect. Therefore, there are some estimations made based on the CBS existing data and from some journals and papers. One of the biggest differences that the post-market is addressed is the difference between packaging and letter post.

The Dutch post-market makes a difference between a package/parcel post and a letter post. This difference is defined in 'Het Postbesluit 2009' as a package post contains different goods than letters and there are also different rules for the size the and the weight of the package (Ballin, 2018). This topic is more in detail explained in the next paragraph 2.2.1.

2.2.1. PDS market

The Dutch post-market consists of several companies, ranging from big companies to small. PostNL is the largest post delivery service in the Netherlands with a market share that is about 58%. DHL Parcel is in the second place with a market share of about 27%. However, DHL Parcel is the biggest packaging delivery service in the Netherlands (Marktscan 2016). The remaining packages are transported by others like UPS, DPD, GLS, and TNT Express. According to CBS (2018), the package delivery market is growing rapidly due to an increase in online shopping. The main activity of those online shops is to sell their products via the Internet. Stores that do sell via the Internet as a side activity, their revenue is growing by at least 21 percent in one year. All the data and graphs that are used in this chapter are based on the market data from StatLine (2018) (Chatterjee P., 2010). Online shopping revenue is increased with 17.5 percent in one year, comparing to 2017. In comparison with other countries, the Netherlands has a very active online shopping consumers market. Last 5 years there was an increase from 55% to 69%. This is a big difference in comparison with other countries, the online shopping market worldwide was 21% and in Europe with 25% in 2017. The growth of the online shopping market has increased more than half in Europe, from 12% in 2012 to 25% in 2017. Likewise, worldwide online shopping is tripled the last 5 years, from 7% in 2012 to 23% in 2017, as mentioned in Figure 5. Next to the online market is it important to mention online purchase, that explained below.

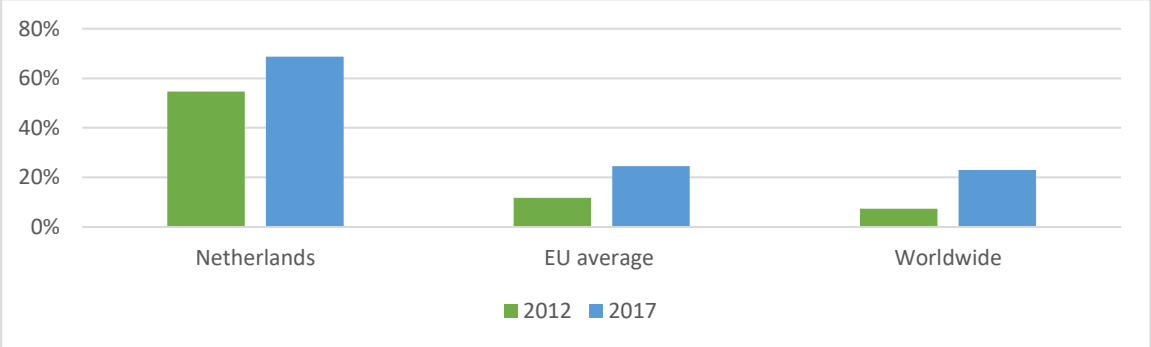


Figure 5. Online shopping growth

Online purchases

The total amount of online purchases is rising in the Netherlands. Each type of purchase is showing a rising trend over the last 5 years. The biggest growth is in the 'groceries' section. This section grew from 7.3% in 2012 to 26.1% in 2017, which is an increase of 257.53% in 5 years (StatLine CBS 2018). Additionally, not only online purchases have been increasing over the last years in every segment, likewise, the value of packaging is increasing, and the total ordered amount has increased as well.

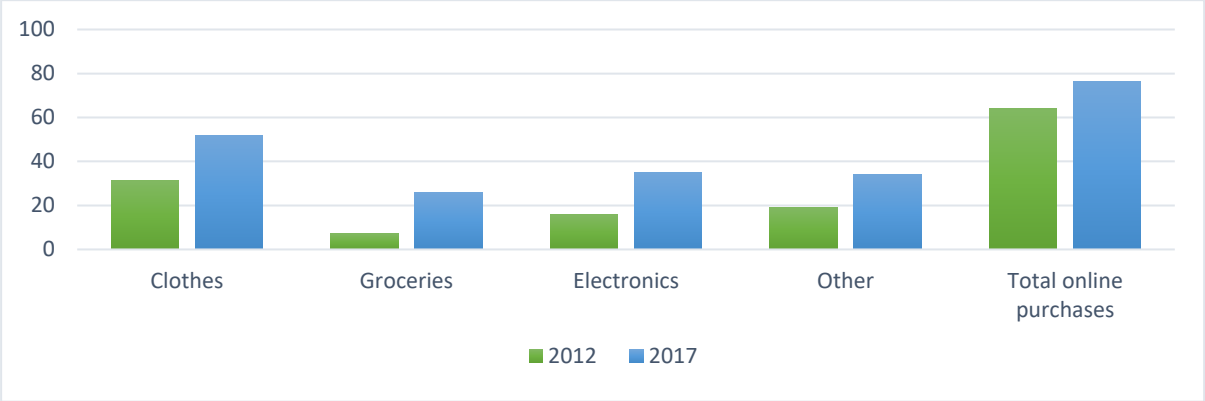


Figure 6. Online purchases between 2012 and 2017 in the Netherlands

Value of package

There is a difference in ordering packages online based on the value of a package. In 2012, 61.7% of the Dutch population made use of online shopping. This number has increased to 73.8% in 2017. The most placed online orders cover a value between 100 and 500 euro. In 2017 there were 25.2% online orders, in comparison with 2012 an increase of 36% (StatLine CBS 2018). Least common orders are the higher value orders of €500 and more. However, those orders are almost doubled in five years; between 2012 and 2017 is increased with an average of 83%.

Figure 7. Value of package

Gender difference

According to CBS statistics (2018), the amount of money one spends online increases every year. There is also a difference between genders. Men and women spend more money online every year. There is a difference in the amount of money one spends based on gender. Women shop more often online for cheaper things than men do (StatLine CBS 2018). However, gender-based differences are reducing in last years. Men and women are both shops online more frequently. The biggest difference between men and women is between the amounts of money that one is spending online. In five years, women spent 50% more on more expensive purchases between €100 and €500, and men spent 37% more in the middle segment between €50 and €100. Therefore, the difference in this latter segment between genders is minimal. The smallest difference is that men buy less cheap products online than women do. This is due to the products that women buy. For example, women buy more cosmetics, food, clothes, and cleaning products than men and those products are usually cheaper. Therefore, men are more likely to buy games, films, and computer soft/hardware online.

Figure 8. Gender difference in online behavior

Packaging delivery satisfaction

The Dutch online shopping consumers choose massively for home delivery of packages. More than 80% of all packages are delivered at home. The remaining part is delivered at a service point or a locker wall. More than 80% of the consumers choose to return packages via service points, sometimes with an opportunity to pick up the package at home (Pape, 2015).

The delivery quality is based on different aspects and there are different opinions about it. Mainly, the customer focus is on how often packages are delivered, how many delivery attempts there are, and how many packages return without worry. This is an important aspect in the choice for a package carrier, in addition to the price. However, several customers indicate that the quality of the parcel carriers has improved in recent years (ACU, 2016).

The consumers prefer to get the package delivered at home, which is a method that has some issues. According to Thuiswinkel.org package delivery at home is not optimal. That is why they focus on optimization and are searching for possible solutions (Pape, 2015). Thuiswinkel.org is a non-profit organization that helps private customers and businesses to know what web

shops are reliable. Additionally, they do their own research on customer and online shopping behavior. Therefore, the Thuiswinkel.org is focusing on the next three points:

- Package safes/walls accessible to all carriers.
- Collection of packages at locations that are easily (free) accessible by car.
- Aim to increase the chance of meeting consumers at the door.

In 2016, around 23% of the customer find the delivery time as the biggest dissatisfaction of the online bought product (CBS, 2016). Unfortunately, there are no scientific studies found about the satisfaction of online customers packaging delivery. In contrast, there are many articles in newspapers and blogs about delivery problems that most of the Dutch customers have. The 5 most common complains are delivery at the neighbors, long delivery time, secret hiding places for packages, damaged packages, and lost packages (Smink, 2018).

2.2.2 PDS delivery

This paragraph is describing the basic principles of packaging delivery together with several segments like costs, time, and competition. Packaging delivering is changing rapidly because of the high amount of packaging delivery that has increased due to the growing trend of online shopping. To provide packaging delivery service in the best possible way, it is important to plot the framework of packaging delivery. Companies are struggling with high costs of delivery and at the same time, they are trying to compete with competitors. Therefore, companies are trying to keep the delivery costs low to satisfy the customers' needs and to provide better service.

Delivery segments

The packaging has three different segments, B2B, B2C, and C2X[1], that is used by most of the packaging delivery companies. The first segment is B2B and is only delivered during the day. The chance that B2B is delivered on the first try is very high because most companies are open during office opening hours, which is the time that most businesses are open. The second segment is B2C. This segment needs a very large network delivery system with delivery service points (Weltevreden, 2008). The segment is growing and facilitates various delivery options to facilitate the receiving of a package and to reduce the number of delivery attempts. For examples, delivery in the evenings, at the weekends, through a package locker system, or through a delivery point. According to Marktscan (ACU, 2016), the B2B and B2C are some and more alike, due to companies are more demand for option B2C segment. In both segments, most parts of the B2B and B2C are using the same infrastructure. The packaging delivery companies that have a foothold in the B2B segment are more and more making use of the B2C segment, and trying to increase it (ACU, 2016). The C2X segment is a delicate network of packaging collecting points. This segment is getting increasingly important because customers can not only pick up their package but also bring it which in turn can be sent back to webshop if needed. According to Marktscan (ACU, 2016), the difference between B2B, B2C and C2X segments are not relevant anymore, due to strong closure between those segments in

[1] Business-to-Business (B2B), Business-to-Client (B2C), and Client-to-Client or Business C2X

packaging delivery service (ACU, 2016). Because of this trend, this research makes no difference between those segments.

Competition segment

PostNL has the largest market share in the domestic parcel transport market, followed by DHL Parcel. The market share of the package delivery sector has remained stable over the period from 2012 to 2015. The C2X segment is almost entirely owned by PostNL. PostNL and DHL Parcel have the strongest position in the B2C segment. The B2B segment seems to be more divided between the four parcel carriers. For cross-border parcel transport, relations between parties are different. This market has more players and is less concentrated than that of domestic parcel transport. According to Marktscan (ACU, 2016), several packaging delivery companies indicate that they are experiencing unfair competition on the market because PostNL would have cost advantages due to the use of 'false self-employed'. Labor costs form an important part of the total business costs. Most of the delivery companies have their own trained staff employed. However, PostNL has hired subcontractors, and costs for a subcontractor are about 40% lower than the costs for a salaried employee. This means that PostNL could save about 30% on labor costs of package carriers on an annual basis (ACU, 2016). Therefore, there were some legal lawsuits against PostNL that they may take advantage of those subcontractors by paying too little. PostNL announced in April 2016 that all new parcel deliverers will receive a fixed contract and that no more agreements will be concluded with independent parcel deliverers. However, PostNL is not the only player in the field that competed unfairly against other delivery companies. For example, DHL Parcel works with permanent postal workers, but they are only paid based on piece wages, making it difficult to monitor whether this is not below the minimum wage.

Costs segment

Labor costs are an important part of the total costs of package delivery. The deployment of independent parcel deliverers by PostNL is a hot topic in the sector. To tackle this problem, a law "*Wet Deregulering Beoordeling Arbeidsrelaties"* (DBA) is being introduced that addresses the problems surrounding bogus subcontractors in this field (ACU, 2016).

In addition, parcel operators indicate in conversations that due to price competition, saving on labor costs is a very important segment (ACU, 2016). There are different costs segments and based on the type of last mile delivery the costs differ. The most expensive delivery is attended delivery, the mid-segment is reception box or controlled access system delivery (Iwan et al., 2016), and the lowest delivery costs are by locker-bank or collection point (ACU, 2016).

Time segment

Delivery time of packages varies from one delivery agency to another. There are no strict rules for delivery times. Some of the delivery companies prefer to deliver on weekdays and during work hours. This because of the work hour payment of delivery staff is lower than for example at weekends. However, the consumer prefers to receive the package in the evening and on

the weekend that results in higher delivery costs. Often this option is possible, however, usually, this type of delivery cost extra, like the package delivered express (Moroz and Polkowski, 2016).

Likewise, the delivery point of packages makes a big difference in delivery time. According to findings that are provided in the research realized in October 2013, of Department of Robotics and Mechatronics at the AGH University of Science and Technology in Krakow (Poland), the parcel lockers delivery is much more efficient and faster than a traditional delivery system. In just one day it is possible to deliver 600 packages within 70 km in comparison to 60 packages in 150 km a day (Iwan et al., 2016). With parcel lockers, consumers can take advantage of the 24-hour availability of the machine. Almost 60% of the parcels are collected between 8 am and 6 pm (Moroz and Polkowski, 2016). This might influence the packaging delivery segment.

Delivery vans segment

Another problem with van delivery is that the vans that are used for the packaging delivery are getting older; an average of 8 years old is driving around. Additionally, almost all of these are equipped with diesel engines, 95%. The delivery vans that are registered on the company name are on average the youngest with 4.1 and 5.9 years old. (Bestelauto's steeds ouder, 2018). In the center of the Netherlands, Randstad, the average age of the vans is younger in comparison with the rest of the country. Average of the 5 biggest cities are Amsterdam 8.2 years, Den Haag 8.5, Rotterdam 7.5 years, Utrecht 6.5, and Eindhoven 8.3 years. Those diesel engine vans are polluting the cities and are already banned to accede to the centers of cities. Eleven cities in the Netherlands have already some kind of restrictions for 'environmental zone', known as 'Milestone' to decrease the soot emissions in the cities due to air pollution (Locaties milieuzones, 2018). Since January 1st2018, diesel cars built before 2005 are restricted to enter the centers of the cities Rotterdam and Utrecht, due to pollution that they cause. Since the first of January 2018 also Amsterdam has a similar policy but for diesel vans with the building year of 2004 and before (Milieuzone bestelauto's, 2018). From 2019, Arnhem will do the same (Milieuzone Rotterdam en Utrecht: voorkom boetes in 2018!, 2018).

2.2.3 PDS approaches

Packaging delivery services (PDS) are provided worldwide and it is increasing in volume everywhere. Because cities were not built and adjusted to have so stressed logistical structure for packaging delivery, it leads to some logistical, financial, and environmental problems. The delivery problem is international, and it is an important topic in most big cities worldwide. Therefore, many parties are searching for the right alternatives and solutions (Iwan et al., 2016). Here below are a few of the current approaches summarized for packaging delivery service (PDS) in the cities worldwide.

Lockers

The first one is the home lockers that are built in front of an apartment or a house that has a key. Also, there are possible lockers that are put in supermarkets and stores where people can open the lockets with an app or a code. Those lockers can be used to pick up, to return, and

to send a package (Iwan et al., 2016). Next, to home lockers, there are also possibilities for automatic mailbox lockers that could be placed in an apartment building, an office, or a campus. 'Bringme' is a Belgium company that develops this type of lockers. The lockers can be used for picking up and sending a package back, independent from the shipper. That service can be provided through an app to provide everyone with access. Also, those lockers could be used as private, so one person's name, as shared with many other people. According to Bringme (2016) experience, around 80% of the packages are small (size of two shoe packages). That is why they have created a standard locker sized.

Those lockers can be extended by diver's sizes boxes. This type of lockers is not yet popular in the Netherlands. Research of Iwan, Kijewska & Lemke (2016) indicates that 43% of the parcel lockers users collect their parcel on their way from work or school to home. This could help to reduce the traffic efficiently and so minimalize the CO2 pollution (Iwan et al., 2016).

There is also a service that provides a possibility for couriers that collect all the packages from the shippers and at once deliver these to the lockers. This minimalizes the traffic flow in cities. Some of the real estate developers that are thinking ahead about developing a neighborhood, are already thinking about the minimalizing the traffic in those neighborhoods and therefore, they are also choosing to localize packaging delivery point, so the traffic flow will be minimalized (Iwan et al., 2016).

Additionally, it is also possible to have a locker somewhere else. According to Iwan et al. (2016), there are six most important localization factors that influence the use of lockers. The most important is that the locker should be close to homes. Secondly, it should be on the way from work to home, and thirdly, it should be close to a parking facility (Iwan et al., 2016). The best and most efficient locations for parcel lockers are within suburbs with high population density next to convenience stores, with high traffic pedestrian area in city centers, shopping centers, and supermarket car parking, petrol stations, service stations, and business centers (Iwan et al., 2016). According to the research of Iwan et al. (2016), most of the customers of internet shops are very satisfied with the utilization of parcel lockers. On the scale from 1 to 1o, customers overall rated the lockers with 8.2 points. The 4 most common reasons for parcel lockers utilization are time, price, availability 24hours, and localization. The 3 most common localization reasons are: close to home 33%, on the way to work 21%, and close to parking 19%.

Drones

Use of drone delivery could help on time and fast delivery, and thus saving delivery costs. Companies like Amazon and UPC are very interested in this approach. Therefore, they invest considerable amount of money in the development of those drones (Desjardins, 2018). However, this approach is not possible yet due to several reasons. The main reasons are related to security, privacy sensibility, and the safety of users and pedestrians in public places (Altawy et al., 2017).

Amazon Keys

Amazon has the following opportunity that helps customers to get the package at home even when they are not home. For this, a customer should install the 'Amazon home kit' that includes a webcam and several smart locks. Therefore, a webcam is recording and registering the delivery person, so the customer does feel save about his/her property. Additionally, since August 2018, it is also possible to receive a package in a car. Therefore, one only needs to download a Key app that can relate to a vehicle, and the package can be delivered in the vehicle when parked at home or other location near the costumer's address book (Amazon Key, 2018).

Neighbors

For those who still want to have the package delivered next to home can choose to make a use of a pickup point by using an app like Homerr, or other similar companies in other countries that provide the same service (Singapore - Park N Parcel's). Homerr is an app where you can choose a delivery to pick up point next to your home. Advantages are that everyone can sing up for this service. However, it is very postcode sensitive. So, the possibility of delivering and bringing the package to the delivery point is dependent on the postcode of a resident. This because if one lives in a remote location (rural area), it is very difficult to be reached by others as potential customers. So, it is easier when one lives in an urban area that has more potential users.

Al those possible and already existing approaches are still in progress on trial and need to be further researched and developed. All those approaches are in development and testing phase because none of them is the overall solution for the problem. However, in combination, they make customers life easier and delivery costs lower in combination with decreasing the transport costs.

Service points

Another possibility is to deliver a package at a service point like a store or a supermarket (Chatterjee, 2010). For this option extra space is needed and the possibility to pick up the package. Moreover, a collection of packages at locations needs to be easily (free) accessible by car and to have a possibility to park a car (Pape, 2015). Depending on the situation, it is possible to pick up the package at the selected address and take it out of a locker or there should be an assistant that can help you to do so.

Additionally, making service points more attractive to consumers rather than have delivered the package at home can have positive effects not only on infrastructure in the cities but also reduce the CO_2 emission per parcel by 83% (De Maere, 2018). Therefore, is important to make service points more available and easily reachable for everyone. That will increase the willingness to combine the accumulation the package with other activities such as shopping, going to work or school and other activities. Based on the study of Belet et al. (2009) only 62% of the consumers combine those activities, and almost 30% of the respondents never combine the activity of collecting their package with other activities.

2.3. PUBLIC PARKING GARAGES (PPG)

The population is growing worldwide, that leads to the growth of cities. Cities are an attractive place to live, visit, and work. The increase of population leads to growing work demand and supply in big cities. Therefore, more people are willing to travel to cities. Growing cities are getting more complicated to manage. The same city needs to deal with more people at the same time, more transport, more activities, and more vehicles.

Cities have a center where diverse activities take place. Therefore, the centers attract people all over to visit. To make a city accessible for everyone, it is important that some people have an option to visit the city by car. Therefore, cities urban planning was built to make sure that there are enough roads and parking spaces for cars. Because of the scarce space in the cities, and to spare some space, there were some parking garages built (Ison and Mulley, 2014). Parking garages are easy to reach by car and are easily accessible from the network around. Most of the parking garages are diffused established in the centers on the easy reached by main roads and surrounded by buildings and houses. Figure 9 shows an example of the City of Eindhoven with all the buildings in red, in between empty spaces for roads and public outside area. Additionally, public parking garages are indicated by blue squares.

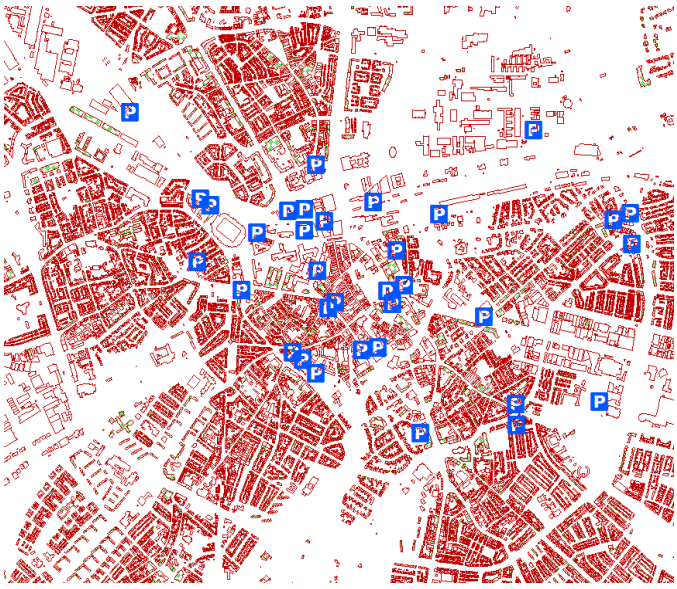


Figure 9. Public parking garages in Eindhoven (own work in TransCAD)

The survey of 'Trends binnenstad 2009' shows that 52% of the visitors use a car when visiting the city center, 13% choose for public transport, and the rest comes by bike or on foot (Prikken & Sengers, 2011). More than half of the people that travel to a city center are using a car, and therefore parking spaces are needed to make it possible to reach a city easily and also park a car nearby the required destination. It is important to have the possibility to park a car not far from the destination. Dependent on the purpose and destination there are two types of parking, long and short-stay parking. Short-term parking is, for instance, doing groceries one needs to park a car for only a few hours. Most of the parking is for long stay parking, due to that on average, a car is used for only one hour a day, the rest of the time a car is parked. Therefore, even if cars will be used, it does not matter because eventually, every car needs to be parked somewhere, as a car is only 5% of a day on the road and 95% not (Shoup, 2005). A car can be parked on-street or off-street. In the Netherlands, on-street parking is more expensive than off-street parking and has decreased by 15% (Ebbing, 2018). The different physical aspects of parking are mentioned in the next chapter, 2.3.1.

2.3.1. Physical aspects

Parking is divided into two categories, on-street parking and off-street parking. Both parking types can have public as private functionalities, paid parking, license parking, or free parking. Also, it could be short or long-term parking with traditional or automated parking system. The Netherlands has 7.8 million cars and 9 million public parking spaces, 2% of these spaces are in parking garages, 17% is car parks, and 81% is street parking, of which 6% is paid parking (Deloitte, 2017). This research only focuses on public off-street parking garages in inner cities.

Due to the high density in the city centers and scarce space, the use of parking space should be efficient, and therefore many car parking buildings are built on multiple floor levels. This approach results in many of the parking spaces in inner cities. Some of the parking garages are highly occupied and some are dealing with a high grade of vacancy. Therefore, some businesses respond to this phenomenon to look for possible options and already existing solutions. Car park managers and owners are willing to find the best solutions to the vacancy problems, for example, rebuild to apartments or studios, storage or other alternatives (Loorbach, 2017). The more there need to be changed on a building, the more expensive it will be. Therefore, it is important to consider that there should be possibilities to use a parking garage for the maximum need for car park customers and use the remained space for alternative activities. The approach that suits the best is sensitive to several aspects, like the type of the building, location, and the current market. There exist various technologies and possibilities to fill in the (partly) empty vacant parking space. However, there is not much known about the possibilities of packaging in parking garages (Taapken, 2018).

An average parking garage is divided into four elements: general, external, technical, and design elements. General elements are for example functionality and architecturally of a building. External elements can be access to roads, zoning, and environmental requirements. Technical elements can be installations, lighting, and ventilation. Design elements can be a parking space, height, parking roads, columns, doors, elevators etc. All those aspects require high use costs and therefore also most of all the parking garages in cities are not free of charge (Shoup, 2005). Therefore, it is very important to know if people are interested in this approach and if they are willing to react to this additional option. Therefore, this possibility is researched in more detail.

2.3.2. Policy aspects

Worldwide all the big cities have increasing congestion, pollution, private car use and parking problems (Ison et al., 2014). Therefore. municipalities, urban planners, and companies take multiple actions to decrease the number of parking spaces and doing this to solve many problems. Every country and city are in some way comparable but in some way not. Therefore, their approaches differ from each other. However, the goal is the same, decrease (unnecessary) private car use in the cities. Considering that cars ending at a parking space, parking management becomes a key tool to reduce congestion and private car use (Gavaldón, 2018). From the governmental perspective, they try to find the legal forms to encourage the use of public transport and/or making car use less attractive by banning cars in the cities and

or by making a car use more expensive. Below are some international examples that are mentioned in the report by Gavaldón (2018).

All those approaches result in decreasing parking space and so also decreasing use of public parking garages. Although it has a positive effect on vehicle use in the cities, it has a negative effect on parking garages profitability as well. Fewer cars in the cities result in vacant parking garages and fewer revenues.

Some of the approaches are effective when looking at private car use, however not enough yet. Cities are encouraging this trend by applying differing methods, dependent on the situation in the city. The effect of decreased private car use results in less needed parking spaces in the cities. Many cities worldwide have a different approach to deal with the increasing vehicle use in the cities that has a negative effect on the cities, such as congestion, pollution, and livability. Therefore, municipalities take actions and try several approaches to decrease car use and to reduce parking spaces in the cities. Views of those international approaches to off-street parking in the cities are summarized below (Gavaldón, 2018).

Table 2. Cities that enacted policies reforming off-street parking, source Gavaldón (2018)

Strategy	Examples from cities
Elimination of minimum parking requirement	Denver, USA; Seoul, South Korea
Implementation of maximums	London, UK
Parking caps by areas	NYC; Boston; Portland, Oregon, USA; Zurich, Switzerland
Parking reductions based on distance to mass transit	Ottawa, Ontario, Canada; Paris, France
Shared parking	Antwerpen, Belgium; Hong Kong, China

Each strategy has its own result and strain amount of effort that needs to be put in. However, all those strategies and approaches have a similar goal, and that is to reduce (unnecessary) car use in the cities. The reduction of car use in the cities results in many positive effects on a city, economy, and residents (Ison et al., 2014).

Elimination of minimum parking requirement – is a strategy where the government uses very strict parking regulations. Usually, there are certain parking spaces required per building. So, the need for parking per user will be met, otherwise there will be less parking spaces built than required. This results in a larger number of spaces than those that the market would naturally provide (Amador et al., 2014).

Implementation of maximums – is the obligated maximum-built parking space in central areas. The main goal is to eliminate on-street parking in favor of off-street parking. Most of the urban management parking is based on the minimum parking regulation that is needed per certain urban zoning plan. However, the UK has a national document that invites cities to regulate the maximum parking space per area (Amador et al., 2014).

Parking caps by areas – is a regulation that is like the previous one with a small difference. Here the maximum regulation of parking space is not per building but is depending on the location (Amador et al., 2014).

Parking reductions based on distance to mass transit – here parking management wants to replace long-stay parking with short-stay parking. Thus, long-stay parkers can use transit like public transport or slow transport modes like walking/biking or sharing vehicles (Amador et al., 2014).

Shared parking – is usually owned by the local government that manages the shared part and makes sure that the parking space will be maximum used by several parties (Amador et al., 2014). A shared parking arrangement between the users and the management of parking space can lead to more use efficiency (Ison et al., 2016).

Reducing parking area to make space for a living has beneficial aspects for the inner cities. Therefore, it makes a more attractive city that leads to even higher city growth, that again results in higher parking demand (Amador et al., 2014). Therefore, in the city of Mexico growing every year, there are around 50 projects to develop new parking spaces. To illustrate the size, 42% of all building area and all projects in the city are required for parking space, and 37% of the total built area includes underground parking.

Another example of reducing parking space to minimalize congestion is presented in Cambridge, UK. Stephan Ison has written a paper in 1996 about 'road pricing' in Cambridge (Ison, 1996). He mentioned that back then Cambridge was suffering from increasing growth of congestion inner the city. Because of the growing economy, 40% of the employees were driving by car every day to the city to get to work. A workplace parking levy (WPL) introduces a charge for some businesses for employee parking. Helping to reduce congestion and generating a new fund that reinvests in local transport improvement and makes it more attractive to travel by alternative means to a car. The first workplace parking levy (WPL) scheme was introduced in Nottingham and was successfully applied in 2012, to fund the tram intentions. It is not designed that it will significantly change travel behavior, rather change funds to better public transport (HCCD, 2016). Hence Nottingham introduces the WPL there are some positive and negative effects. The WPL applies for employees that provide 11 or more parking places. The employee needs to pay for each parking space. If the employer has 10 or less than the other parking spaces will be a charge. This approach was electively for Nottingham. However, there is no proving that this will do in other cities and outside the UK.

2.3.3. User-based aspect

The parking demand is rising in the inner cities. However, inhabitants of the cities are having significantly less private cars per inhabitant than in the rural area. This is because of the higher density the distance to facilities that is very small and can be easily reached by the foot of the bicycle, for further destinations transfer is very easy and fast due to a good infrastructure, car sharing and public transport.

Cities are an attractive meeting place where people can work, recreate, and live. Those are the aspects that attract many not only to live in a city but also to visit. The increase of the parking demand is mainly because of the city visitors. Many are visiting cities for work and for leisure like shopping (Bijland et al, 2017). Those are two different types of parking users. The people that need to park their car for work are long-stay parking users and people who are visiting a city to shop are usually short-stay parking users (Amador et al., 2014). Most short-stay parking hours take place on Saturdays; twice as much as on Monday (Ebbing, 2018). The figure below is from the annual Spark Parkeren report about parking trends and data in the Netherlands.

There are slight some differences between the days in a week. The trend lines over the day hours are relatively the same. The businesses start in the morning around 8 am and it goes up until 3 pm, around 6 pm there is a snap. This snap is to explain that people are leaving their jobs and are switching with people that are visiting evening leisures like shopping in the evening, going out, or doing groceries after work hours. At the weekend, there is a higher peak than the rest of the midweek and it starts also a few hours later. Also, the parking use is higher if the shops are open until late hours. In overall, the trend of most used parking is from 9 am until 11 pm, as mentioned in Figure 10.

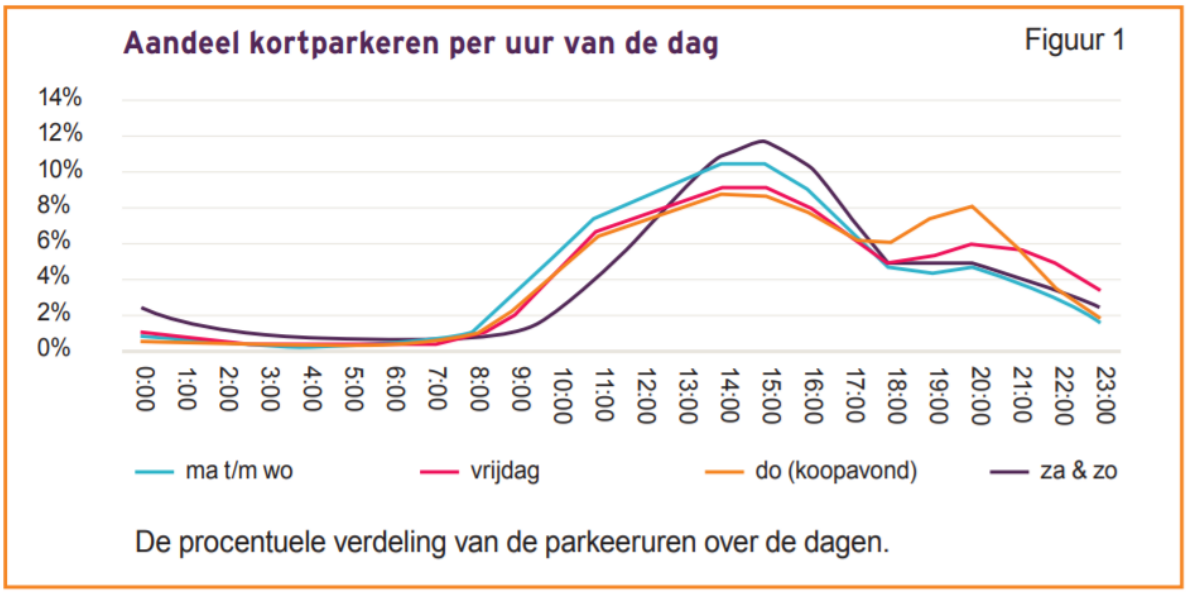


Figure 10. Total parking hours per day (Spark, 2018)

There are several studies done on parking behavior and parking garage attributes that influence the parking choice behavior of car drivers. Car park users have more value in various attributes regarding the ease of use, social safety, price level, amenity value, available services, and quality of the parking (Litman, 2006). According to ANWB (2013), Menda et al. (2003), Trendbox (2010), and Van der Waerden et al. (2012, 2015, 2016, 2017), there are many attributes that may influence the choice behavior of a customer. The most common attributes are price level (with the preference for free parking), the level of being able to find a free parking space, feeling of safety, and parking location followed by opening hours of a parking garage. The less relevant factors are attributes signposting and services. Additionally, it is

important to know who the customers of parking garages are and how often and why they are making use of parking facilities.

According to the master research of Agarad (2017), there are four main motives to visit a car park. The most common motives to visit a car park are shopping, recreation, and leisure. Half of the respondents rarely make use of car parks to pick up and drop off a certain person. More than half respondents 58% responded to never making use of car parks when they travel from home to work. This might be due to no existence of a car park next to home/work or no need to use a car park (Agarad, 2017). The frequency of visiting a car park was the biggest for the group of a few times a year 47%. The up following group occasionally visit car park that more like few times a month 30%, next group visit car parks weekly 16%, and the last group visit a car park almost daily 6% (Agarad, 2017). Those numbers are based on a research of 299 respondents in the Netherlands. Those numbers are based on limited data and the distribution between the respondents is not equal to the national level, as most of the respondents are men 69%, and the majority is middle aged 82%. These facts may influence the results of the user's willingness to use car parks and the frequency of it. According to ANWB research, parking on the street is the most used parking type (42%) due to the short walking distance to the destination. The second most used parking space is at a parking lot (35%). The parking garage is least often used (8%). However, the parking garage is clearly more often used in an urban area 22% than outside urban areas 5% (Van Ewijk, 2013).

Younger people are shifting from a rural area to the cities for their studies. After the study, most of those young professionals are willing to move to the rural area because of the limited space and tense real estate market in the city. This trend is still the same in Amsterdam and Utrecht. However, in the rest of the Netherlands young professionals are willing to stay in the city and have their children there (Bijland et al., 2017). Therefore, they are more adapted and are more willing to use public transport and slow mode in the city. People in rural areas are more dependent on private car usage, as the facilities are more away than in a city and public transport is usually not that flexible.

As young people are deciding to stay and to live in a city, they adapt to the circumstances and are not seeing the need of having a car and so less need to get the driving license. Therefore, less young people are getting their driver license (Bijland et al., 2017). This results in the difference in car ownership. As it is shown in figure 10 below, there is a big difference in car ownership per age category in the Netherlands. Since 2007, there is a decreasing amount of car owners in the age category between 18 and 20 years with 3% and 30 and 40 years with -13%. Other categories are rising. This can be explained by the demographical changes as people getting older. People in the age 65 and older have the biggest change, an increase of 41% in 6-year time. (CBS, 2018).

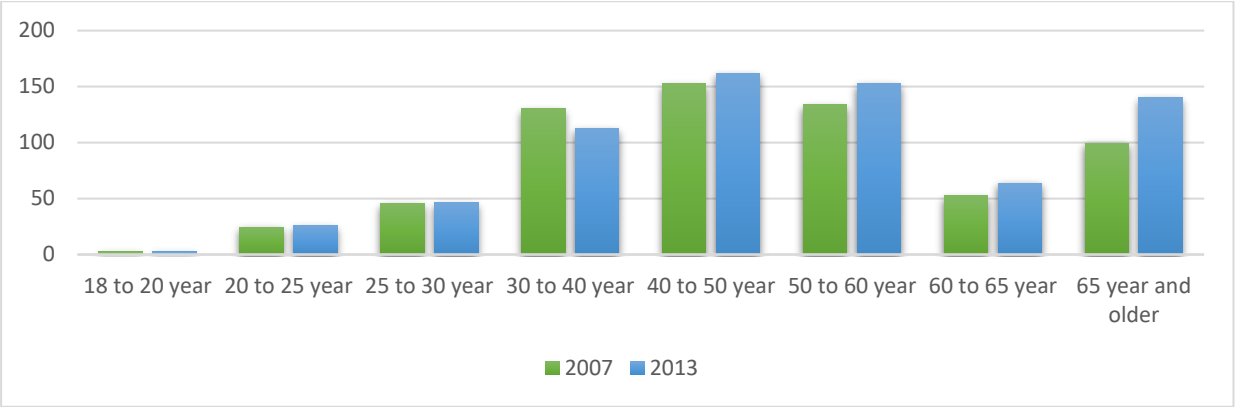


Figure 11. Car ownership per age category N x 10,000 (CBS, 2013)

Past 28 years, a car growth was increasing on average with 1% each year. The total increase was 42%. Since 2008 until 2018, the growth was only 6%. The increase is still there but last decennia are becoming more stable than in previous years.

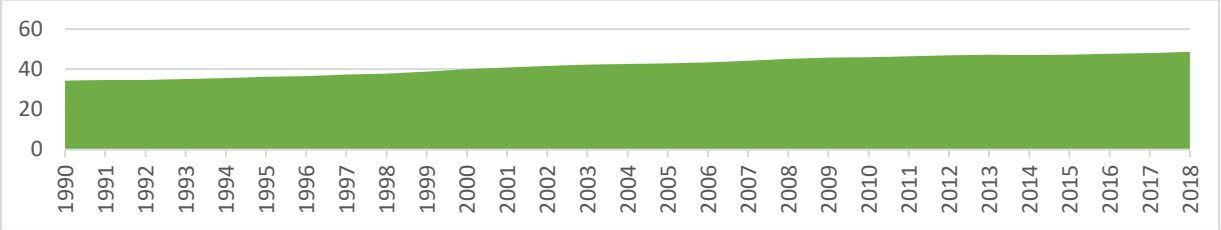


Figure 12. Total personal car ownership per 10.000 persons (CBS, 2018)

Concluding, car ownership has increased over the last three decades. Some of the articles address that the ownership increase per individual shall lead to more parking space demand. According to Spark Parkeren, there is a rising trend of parking sold hours in center cities sins 2013 (Ebbing, 2018). However, it has to be noted that de demand went down after the economic crisis of 2008. This trend was negative for 5 years in a row. In 2013, 5 years after the economic crisis is the economy and so the sold parking hours are increased. Last year there is a lower increase than a few years before. Here below is an illustration from Spark Parkeren analysis of the sold parking hours over the last 10 years in the Netherlands.

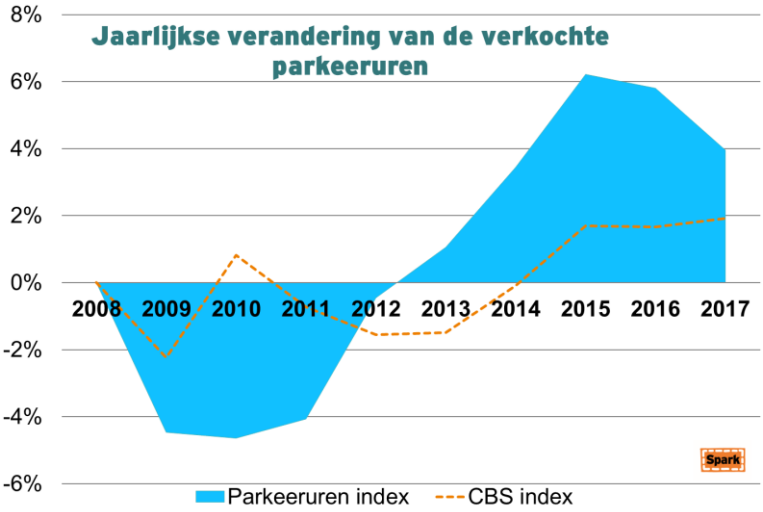


Figure 13. Over years changing the trend of sold parking hours in the Netherlands (Ebbing, 2018)

According to the Spark Parkeren research, the use of parking garages has increased by 39% since 2008, while parking on-street has decreased by 15% (Ebbing, 2018). From 2010 to 2015 car parks are increased by 5%, mostly due to the increase in population (Kuhl et al., 2015). In the same year, the population growth increased by 3.5%. The increase of grownups leads to

more drive license. This growth is bigger for women than for men. The half of the household has at least one car; a quarter has two or more cars. According to the Parking Fund Nederland IV report, the parking demand will increase due to growing car ownership and an increase of mobility in a combination of space scarcity in the inner cities (Kuhl et al., 2015).

However, comparing figure 11 and figure 12, here above, those two trends are contradicting. In figure 7 there is no decrease in car ownership analyzed, however, due to figure 8 the total sold parking hours decreased from 2008 to 2013. In those 5 years, the total car ownership increased by 6% in total, and at the same time, the total sold parking hours decreased by over 4% per year. From 2013 the total sold parking hours started increasing positively. In 2015 the increase reached over 6%, after that it dropped to 4% in two years. In the same period from 2013 to 2016, there was no change in ownership; it was stable at 0%.

Additionally, it is not simple to link car ownership directly to parking demand. Therefore, there could be other reasons for an explanation that could be a topic for another research. Additionally, it is important to know what reasons people consider when willing or not willing to park. Therefore, a research is needed to measure the satisfaction of car users around the parking possibilities and their opinion on it.

The Royal Dutch Touring Club ANWB included their members (4.4 million) as participants in their research on parking satisfaction in the Netherlands. According to ANWB research 'Onderzoek Parkeren' (2013), the results show the most common annoyance among the parking users (Van Ewijk, 2013). The top three from most unsatisfied to less unsatisfied is the parking fees (71%), the small parking spaces (45%), and paying for parking in advance (30%). The respondents are satisfied with the logistical aspects, the safety, and the sense of security in parking garages. People are most satisfied with the findability of their car (77%), user-friendliness of the ticket machines (65%), and the number of free parking spaces (62%) (Van Ewijk, 2013).

Concluding, that users are satisfied with the provided parking services like a wide range of space, safety, and user-friendliness. However, users do not like to pay much for the parking. This is the counterpart of what people are saying that they are willing to do as shown in a thesis research done by Bukers (2014) and Soest (2014). The findings of their research are mentioned in the article of Van der Waerden (2016). The respondents in the research were willing to pay more for provided parking space, as they also got some extra service (Van der Waerden, 2016).

2.3.4. Future developments

According to Deloitte, it is expected that 40% less parking space will be needed in the cities by 2040, mainly due to the smart mobility (Deloitte, 2017). Deloitte calculated that the current total parking capacity in 2017 is 14.4 million parking spots. Due to cities expansion, the total parking capacity will grow with 1.5 million. However, Deloitte assumes that the total parking need will be reduced to 6.9 million by 2040. That result in only 9 million parking spots needed and makes room for 45,000 home houses plus 11.7 million trees (Deloitte, 2017). Some researchers say that parking garages are getting vacant in the future due to car sharing,

autonomous cars, and governments measurements to make cities car-free (Khreis, Nieuwenhuijsen & Bastiaanssen,2017). However, some researches are not getting into this, because they predict the growth of parking need, due to economic growth and increase car ownership per person.

Car-free cities

Worldwide many cities are trying to reduce car use in the cities by implementing many divers' activities as explained above. Many journals and newspapers are talking about those changes (Khreis et al., 2017). There are also some papers that address the struggles cities are facing when creating car-free zones within the city, Pecha Kucha Abstracts / Journal of Transport & Health 5 (2017). However, there is limited scientific literature about a car-free cities and the consequences of these. Small/compact cities are easier to change. However, it is still a big challenge to do so, due to the transformation that cities need to make. The cities are designed for car use and the existing infrastructure is not simply to change. Additionally, not only the urban design but also people attitude, and behavior need to be changing to make it possible. Furthermore, retail interest and the car industry may be some of the biggest barriers (Khreis, 2017).

Car sharing

Car sharing is a trend that is growing very rapidly last years. Increasingly more people are aware of the option of car sharing. In big cities, carsharing is most popular. The more urban and crowded cities are, the more growth is seen. In rural areas, the growth is significantly less. The increase in car sharing leads to less car use and decreasing car ownership (KpVV, 2017). The people that make use of car sharing are making fewer car trips than car owners. Instead, they are making more use of public transport, bicycle and walking (Shaheen et al., 2015). This trend is also resulting in less need op car parks.

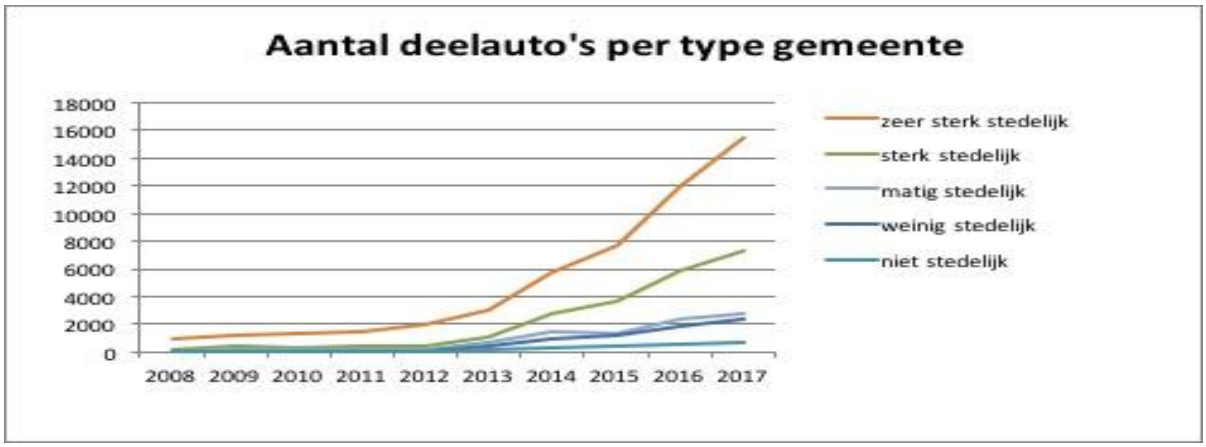


Figure 14. Total carsharing growth per municipality type (source: CROW-KpVV, 2017)

Self-driving vehicles

From the companies' perspective, they are trying to solve and to improve Self-driving vehicles (SDV). This could be very important in decreasing congestion, parking need, and safety of

people. SDV is considered safer than human driving. However, the issue with the SDV is the legal framework around it, which is still not solved properly (Daily, 2017).

There are various ways to present cars in the cities. Sampson (2012) pointed one of the solutions to prevent car use by not bounding them in the cities but to provide other alternatives that make movement through the cities easier, faster, cheaper, and environmentally friendly. The alternative could be Pod *"A pod is an individual person mover - a covered chair on wheels that can be driven. A pod is transport on a human scale; small enough to fit through a doorway, drive into a lift or do a U-turn in a parking bay; light enough to travel all day on a car battery; slow enough to not endanger pedestrians and cyclists; safe enough that a child and the infirm can drive one; and cheap enough that anyone who can afford a monthly bus fare can buy one."* (Sampson J., 2012)

2.4. PDS & PPG GAPS

There are not many scientific studies done on this specific problem. Usually, the studies that are done on the same subject, like delivery satisfaction or online shopping, are only based on the trends and not from the perspective of the user and the willingness to change. The studies about parking garage users are considering the use of the empty parking garage spaces and alternatives for these spaces. The opportunities for the use of PDS in PPG is not described in these studies as an option.

Considering the growth of packaging delivery trend and decreasing parking demand in the inner cities, it is reasonable to assume that this trend will be growing in the future, therefore it is important to take this into account and adjust to it with possible scenarios and additional problem-solving.

Home delivery is getting more expensive and the government wants to have fewer vans driving on the streets of the cities, delivering the packages. Urban planning is also very interactive with the parking space in each city. Car ownership worldwide increases and therefore, the required parking space per car also. However, due to shifting transport mode to car sharing, autonomous cars, and governance stimulation of using slow mode transport as walking and bicycling, and legal changes to demotivate and decrease car use in the inner cities. This might influence the use of parking in the cities.

2.5. CONCLUSIONS

It is expensive to deliver packages at home. Storage at the neighbor's home is fine, but then people must be willing to do it. Will people have their packages delivered to a parking garage? This has two advantages that cannot be found in other pick-up locations such as shops. The main advantage is that there is enough space where packages could be kept (to serve as a warehouse). The second advantage concerns the ease of access as well as extended opening hours.

According to Iwan et al. (2016), the most important requirement for placing package lockers is the location. The location is based on the following aspects: close to home, on the way to

work, and close to parking. However, other studies have only shown that the aspects “close to home” and “on the way to work” are relevant (Moroz and Polkowski, 2016), (Visser, 2014), contradicting the “close to parking” aspect mentioned by Iwan et al. (2016). Since there are no other studies found for the close to parking aspect, incorporating the aspect in this study is worthwhile.

The existing parking garages in inner cities have all the facilities provided for the user to make use of it. All the parking garages are accessible by foot and by car. This can be used to easily adapt parking garages for an extra service such as packaging delivery. In this way, it is possible for a parking garage to have an additional service that may help the customer to have the package delivered to their parking spot, parking garages managers to distribute risk, and to a city to minimalize transport movement in favor of environmental aspects. The technical and legal part of the parking garage still need to be analyzed in subsequent research. However, before research and analysis of further technical and legal aspects of parking garages, it is important to analyze the customer willingness to use this extra service of a packaging delivery possibility in a parking garage. Additionally, finding the aspects that may have some positive or negative aspects of this approach. The method and findings of this research are explained in the next chapter 3.

3. Research approach

This chapter is about the research approach that has been used for this research. The individual choice behavior of the consumer is addressed in this research and therefore there has been chosen to do a stated preference analysis since this method fits well with behavioral preference research. Additionally, an ordinal regression analysis has been conducted to gain further insight, which will be enlightened at the end of this chapter. The research method is explained in stages in this chapter.

3.1. INTRODUCTION

Based on the previous chapter, it is concluded that there is not much research done on problems that are addressed in this research. Much of the research is done about online shopping behavior and the possibilities that are related to a vacancy in parking garages. However, there are a few articles that publish information about packaging delivery in public spaces and what kind of results this approach brings forth it has for the result. Most of the current published those articles do not cover scientific researches related to online shopping behavior variables as and the delivery aspects. Those researches do not contain enough relevant data to use for this research. Additionally, most of the current research related to the topic in these studies are done by companies in the field, which could question the reliability of the results that is not objective. Because the data is presented by companies that have own interests and cannot be used as a trustful resource. Hereby, the extent to which the current published research can be used in this study is limited. This limits our research to use information that is available in practice, that has not enough reliable information to use in this research scope. Keeping this in mind. Therefore, it is important to use trustful data and to have a research approach that is useful for this research. Additionally, there is no comparison possible with existing approaches as a basis to base that can help this research. Therefore, it is needed to simulate a possible approach and to test it in real life by a survey and is chosen to do a refined survey.

Expectations

This chapter is about the method, research design, and expected results. Based on the literature research it is expected that there are some attributes that have to be considered in this research. By using those attributes in the survey, it becomes possible to check if the attributes that are found in the literature are also significant in this context. It is also possible to see in what way attributes are relevant and for whom. For example, to measure the preferences of car drivers the method stated a preference (SP) is used. This method is explained in section 3.3. The conceptual model explains the expected relations that are included in this research.

Conceptual model

Based on the literature research and the gaps that are found in it, the following conceptual model is developed, as mentioned in Figure 14. The model includes 4 elements that are relevant to this research:

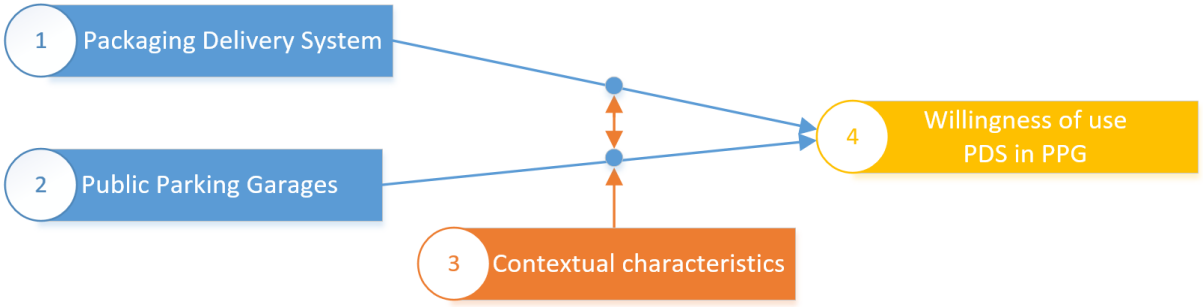


Figure 15. Conceptual model with four elements

1. Parking delivery service (PDS): this element summarizes attributes of PDS that may influence peoples' willingness.
2. Public Parking Garages (PPG): this element summarizes attributes of PPG that may influence peoples' willingness.
3. Contextual characteristics of respondents that may influence the decision making.
4. Willingness to use PDS in PPG. Here the preferences of individuals will be measured.

The attributes of packaging delivery and parking are combined into hypothetical situations. In addition, to find out if young people or women are less or more willing to make use of the parking garage for package delivery services several contextual characteristics are collected.

3.2. INDIVIDUAL CHOICE BEHAVIOR

To find out if the attributes that are found in the literature study are relevant for this study it is needed to do a survey. Therefore, this research makes use of a questionnaire, to find out what the characteristics and the attributes are that may influence the willingness of people to use parking garages as packaging delivery service points.

The decision making of individuals is a complicated process that needs a precise approach. Making choices is something all people do continuously during the day (Hensher, Rose, & Greene, 2005). To make a choice at least two or more alternatives are needed. Based on the value and benefit of each alternative, individuals calculate what the most preferable alternative is for them. This choice is made on the value an individual has based on his/her experience and knowledge (Simon, 1955). Therefore, this is very personal and may differ per person. By making those calculations between various alternatives, researchers are using utility theory. There are two types of utility, strict and random utility (Hensher et al., 2005). The strict utility is using all the alternatives and choices together not making a difference between individual preferences. The random alternative does make a difference between the

individuals and calculates what one needs to make a choice. That is needed for this research. Therefore, the random utility will be used in this research with the following formula (Hensher et al., 2005):

$$V_{qi} = \sum \beta_k \cdot X_{qik}$$

V_{qi} is the systematic utility of alternative i^k of individual *q;*
X_{qik} represents the value of attribute *k* of alternative *i* for individual *q*
β_k is a parameter indicating the contribution of attribute *k* to the total utility of each alternative.

3.3. MEASURING PREFERENCES

This paragraph is about preferences and the stages that need to be done to measure those preferences. Therefore, a theory from the book of Hensher, Rose & Greene (2005) is used to support the theoretical scope of this research.

3.3.1. Introduction

The methods for measuring preferences and to use the outcomes in this research is the stated preference experiment (SP). It is used with discrete choice analysis (DCA) and a survey as result by using questionnaires for collecting the data.

The revealed preference (RP) data represent data that actually have been occurred. *''Revealed preference data (RP data) represents data collected on choices that are made''* (Hensher et al., 2005). Stated preference is an imaginative preference that is derived from hypothetical/ imaginary behavior that is based on attributes of alternatives. Additionally, the next difference in the number of observations obtained from those two methods. "*With SP data, respondents are usually shown multiple choice sets, each of which has different attribute levels (and possibly even different alternatives present, depending on the design). Thus for each respondent, we gain multiple observations over the number of choices sets completed. RP data, however, usually provide the analyst with information about the single choice that was made."* (Hensher et al., 2005,).

Table 3. Advantages and disadvantages of revealed and stated preference (Hensher et al., 2005)

	Revealed Preference	Stated Preference
Advantages	- RP data choices collection is only based on "real-life" existing alternatives. - The approach is about real choices in real markets. - Choices are made in the real market environment. - Data are often quickly available and in large quantities.	- SP data gives the possibility to represent choices in hypothetical situations. - New facilities or products that do not currently exist can be researched easily. - Low/No correlation between the attributes of an alternative. - Multiple observations are possible per respondent.
Disadvantages	- Decision makers are limited in their choice, that may influence their behavior and the choices they hypothetically could be making, as with SP data. - The chosen alternative is known within a certain field and often little known about. - Sometimes the correlation is significant between effects in the data. - Reflect only the existing market, thus no estimation of non-use values.	- It is not possible to say with 100% certainty that people will do what they saying that they will do in real life the same in the same situation. - The uncertainty of people make the same choices under the same condition in "real life" world.

Since the possible solution to the research problem does not commonly exist yet, the choice for this research is the SP method. This allows creating a link between what people prefer and what the attributes are that influences their preference.

3.3.2. Stated preference experiment

The chosen method is based on the product/service that not exists yet. Based on the SP it is possible to make suggestions about the characteristics that make a PPG attractive for PDS use. By defining dependent and independent attributes and vary them in the research, it will be investigated during interviews and questionnaire. Based on attributes and attribute levels, various alternatives are defined. It concerns several alternatives that respondents need to evaluate. Based on the answers of the respondents, the relevance of the attributes can be identified. The eight stages for the stated choice experiment of the book of Hensher Rose and Greene (2005) that are mentioned before section 1.6, are detailed in relation to the current topic of investigation in Figure 16.

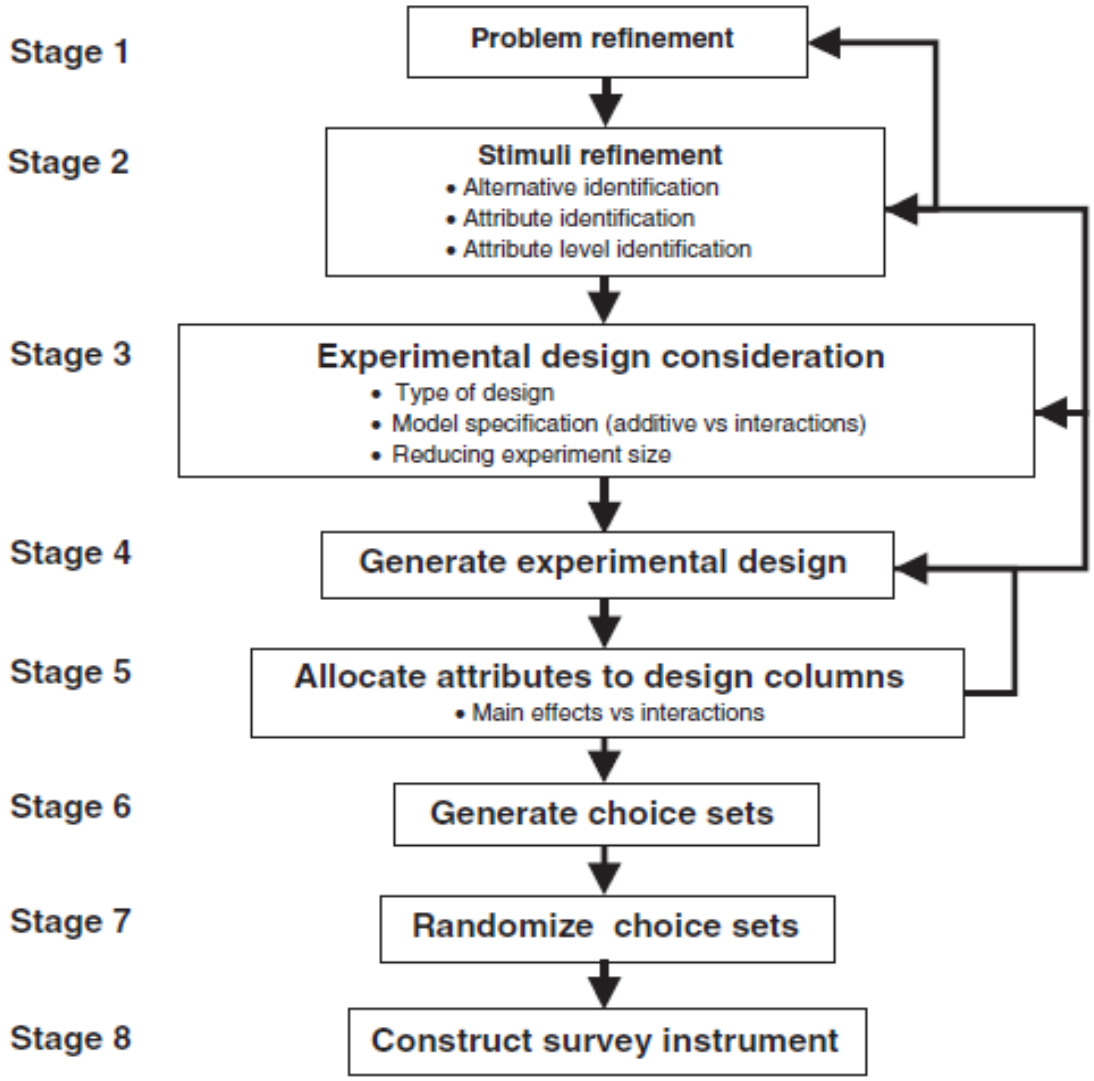


Figure 16. The experimental design process, retrieved from Hensher, Rose, & Greene (2015)

Stage 1

This stage is all about the problem refinement of this research. Based on the main question of this research it is important to focus on the basic question of this experiment. In this case to find out what attributes of PDS and PPG are influencing peoples' willingness to use PPG as PDS point.

Stage 2

Stage two is based on the measurements and attributes that are used for this research. The reference for alternative measurements was determined and their objects. In this study, an alternative is a combination of a public parking garage (PPG) and a package that has to be delivered. This includes attributes definition together with the levels of distribution, that is in this case divided into three parts.

In this research, there 8 attributes are used to define the alternatives. Four attributes describe the package that has to be delivered. The other 4 attributes describe the parking garage that is involved. Eight attributes make the description of the alternative a bit complicated to

understand. However, it is needed to know what attributes are significant and why. To make the task a bit simpler there has been chosen to use for each selected attribute only 3 (ordinal ranked) levels. This makes an evaluation of the alternative simpler for respondents. Furthermore, the attributes and their level are explained after table 3.

The selection and definition of the attributes and their levels are based on a literature study. An overview is in Table 3 below. Eight attributes are selected with every three levels. Using eight attributes is the maximum to make a preferable decision in SP survey (Hensher et al., 2005).

Table 4. Attribute and attribute levels of survey

Type	#	Attributes	#	Attribute levels
PDS	1	*Package value*	1	€ 50
			2	€ 250
			3	€ 450
	2	*Package type*	1	short shelf life product - 1 day
			2	long shelf life product - 7 days
			3	no shelf life product - unlimited
	3	*Package size*	1	small (shoe box)
			2	medium (moving box)
			3	large (freezer box)
	4	*Package weight*	1	5 kg
			2	10 kg
			3	15 kg
PPG	5	*Opening hours*	1	whole day (24 hours)
			2	extend working day (7:00-22:00)
			3	shopping opening hours (9:00-18:00)
	6	*Free parking*	1	15 minutes
			2	30 minutes
			3	45 minutes
	7	*Travel time PPG - home*	1	5 minutes
			2	10 minutes
			3	15 minutes
	8	*Assistance*	1	personal assistance
			2	no assistance
			3	intercom assistance

1. Package value

The first set of attributes includes package related attributes. Here is chosen to make use of the value of packaging. The used levels are the money value of €50, €250, and €450 per package. This distribution is based on the literature of StatLine CBS (2018). Where the most

ordered packages online are in between €100 and €500. By making this distribution it is possible to define the value of 100 and 500 and to see if there is any difference between the lower value segments.

2. **Package type**

The second attribute is the type of package. This attribute is relevant to know if online customers see the difference between the long shelf and short shelf life of the content of the package. Short shelf life could be things that can go bad in one day, like flowers. Therefore, the short shelf life is shorted to one day. The long shelf life products could be something that needs to be consumed like fresh food. Unlimited shelf life products are products like clothes and other products that do not have an expiry date.

3. **Package size**

The third attribute is the size of the package. The decision about the attribute levels is based on the most ordered products online, that is clothing and electronics. However, some of the things could fit into a size of a shoebox, it is important to see the difference between the different sizes of packages, to know if the size makes a difference in the decision-making process.

4. **Opening hours**

Fourth and last package related attribute is the weight of the package. Many packaging delivery companies deliver packages untill maximum 30 kg per package. However, for this research, the weight does make a difference but in lower weight segment. Therefore, there is chosen to use weights of 5 kg, 10 kg and 15 kg as a maximum. Those are the weights that could be taken not only by car but also by foot or bike. So, it could be a possibility for a customer to pick up a package not only by car but also by bike or foot. '*If the distance exceeds 1 kilometer than there is a 70% chance that the customer will take the car'* (Arnold, D C Barbosa, Sörensen, & Dewulf, 2018). It is relevant to know if different distances change the willingness to pick up the package.

5. **Package size**

The fifth attribute is the first attribute of the public parking garage and consists of the opening hours of the parking garage. Most of the public parking garages in the cities are open 24 hours per day. According to Spark Parkeren (2018), the busiest visiting hours of a parking garage is between 10:00 and 17:00 with a span between 8:00 and 23:00. Therefore, this attribute is divided into 3 levels. The first level is based on a whole day open possibility of 24 hours. The second level is based on office opening hours from 7:00 until 22:00, and the third level is based on the opening hours of shops that are mainly between 9:00 and 18:00. With this level, it is possible to find out if potential customers need a packaging delivery point that is open the whole day or is the more righted opening hours also preferable.

6. Free parking

The sixth attribute is the 'parking for the free' possibility. This attribute is used to see if the respondents will react to this positive attribute as some parking time will be for free. The three levels are needed to conclude in what span of time customers need to have free parking possibility to pick up a package. The attributes level here are 15, 30, and 45 minutes. The assumption is that 15 until 30 minutes free parking should be enough to pick up a package and maybe do some groceries. Therefore, it is preferable to see if this assumption is correct, or do customers need more time to do so or will less time be effective. Additionally, due to this attribute, it is possible to make it attractive to customers to have their package delivered at the parking garage.

7. Travel time PPG to home

The seventh attribute is the travel time from home to the parking garage. Van der Waerden and Oppewal (1995) found that parking cost and walking distance are the most significant attributes in the context of shopping trips. As this research is focused on public parking garages in cities center where shopping is included, it is beneficial to know if the distance is significant in this case. This attribute is divided into three levels: 5, 10 and 15 minutes. The distance is very short, this is because we would like to have people that can travel to the parking garage not only by car but also by bike or even on foot. However, the distance in minutes is chosen because most of the people have a good perception of how much time it takes to get somewhere. The choice for a car instead of a bike is made due to estimation that most people go by car and not bike to a parking garage. So, this would make a choice easier and not getting respondents confused by another transport mode. This deviation is chosen to analyze what the effect of distance is on respondents' willingness to travel to the parking garage by car. This provides also the distance that can be used around each parking garage in the cities as a buffer for further research.

8. Assistance

The last attribute is the presence of assistance in the parking garage. Due to literature, the assistance might play a role by choosing a parking garage. Therefore, it is important to investigate this attribute and to test it in case of a parking garage in combination with packaging delivery. Therefore, there is chosen to have not only real-life assistance but also an intercom assistance that may help and no assistance at all level. This attribute helps to analyze the importance to have an assistant at the parking garage in combination with packaging delivery service.

Stages 3 & 4

As explained in the previous paragraph, in this research the stated preference (SP) method will be used. The research will focus on the preferences of individuals. Alternatives are specified using the selected attributes that are related to the parking garages and the packages. The collected data regarding preferences that individuals provide, will be collected

in SPSS and analyzed following the method of stated preference. Those data can be specified in a revealed preference (RP).

The main effect of attributes is that they are independent of each other. Combining all the attributes levels result in 6,561 combinations of parking garages and packages. This is the result of a full factorial design of 3 to the power of 8 equals 6,561 combinations. This number is too big to include in a research.

Stage 5

A fraction of the full factorial design has to be considered. Type of fractional factorial design includes main effects for making this design based on the theory of Hahn & Shapiro used of Addleman tables. This process resulted in 27 combinations for which the main effects of the attributes can be investigated independently, as mentioned in Table 4. The main effect is the most important one, and for that using 27 combinations is enough. The design is generated and controlled using SPSS.

Table 5. Alternatives with attribute levels

	Packaging attributes				Parking attributes			
Alternatives	Value package	Self-life	Size package	Weight package	Travel time	Open hours	Free parking	Assistance
1*	1	3	2	2	1	1	2	3
2	2	3	3	1	3	2	3	1
3	2	3	1	1	2	1	2	2
4	2	2	2	2	2	1	3	1
5	1	2	1	3	3	3	2	3
6	3	2	2	1	2	3	2	1
7	3	2	3	1	1	2	1	2
8	1	2	2	3	2	2	1	1
9	2	2	1	2	3	2	1	3
10	3	3	3	3	3	1	2	1
11	1	1	3	1	2	2	2	3
12	2	1	1	3	1	3	3	1
13	3	1	1	2	1	2	2	1
14	3	1	2	2	3	1	1	2
15	1	2	3	3	1	1	3	2
16	1	3	1	2	2	2	3	2
17	2	3	2	1	1	3	1	3
18	1	1	1	1	1	1	1	1
19	1	1	2	1	3	3	3	2
20	3	3	2	3	1	2	3	3
21	2	1	2	3	3	2	2	2
22	3	1	3	2	2	3	3	3
23	2	2	3	2	1	3	2	2
24	3	2	1	1	3	1	3	3
25	3	3	1	3	2	3	1	2
26	1	3	3	2	3	3	1	1
27	2	1	3	3	2	1	1	3

For example, **1*** this is the first of 27 combinations that may be shown during the survey where the respondents need to make a choice if he/she is willing to make use of the packaging delivery service under those circumstances. Alternative **1*** has a code of 1,3,2,2,1,1,2,3 that means that the attributes of the package are: Value package of €50, Self-life is unlimited, Size of the package is medium and the weight of the package is 10 kg, also there are four attributes of a parking garage, and those are: Travel time of 15 minutes, Open hours of whole day, free parking for 30 minutes and has intercom assistance.

Stages 6 & 7

According to Hensher et al. (2015), the design of the evaluation task should be made. Here there is offered only one combination at a time. For each alternative, the respondent must indicate whether he/she thinks this fits him/her and make a choice on the rating scale, see stage 8. Each respondent evaluated 9 combinations include PPG and Package attributes. In this stage, the attributes are randomly balanced out of 27 combinations.

Stage 8

The last stage is to construct the experiment starting with an introduction where every attribute was explained with an example of the choice task. This example is shown below. The respondents are invited to look at the attributes and indicate if they are willing to make use of those provided option. Here below is the example of that was given during the survey.

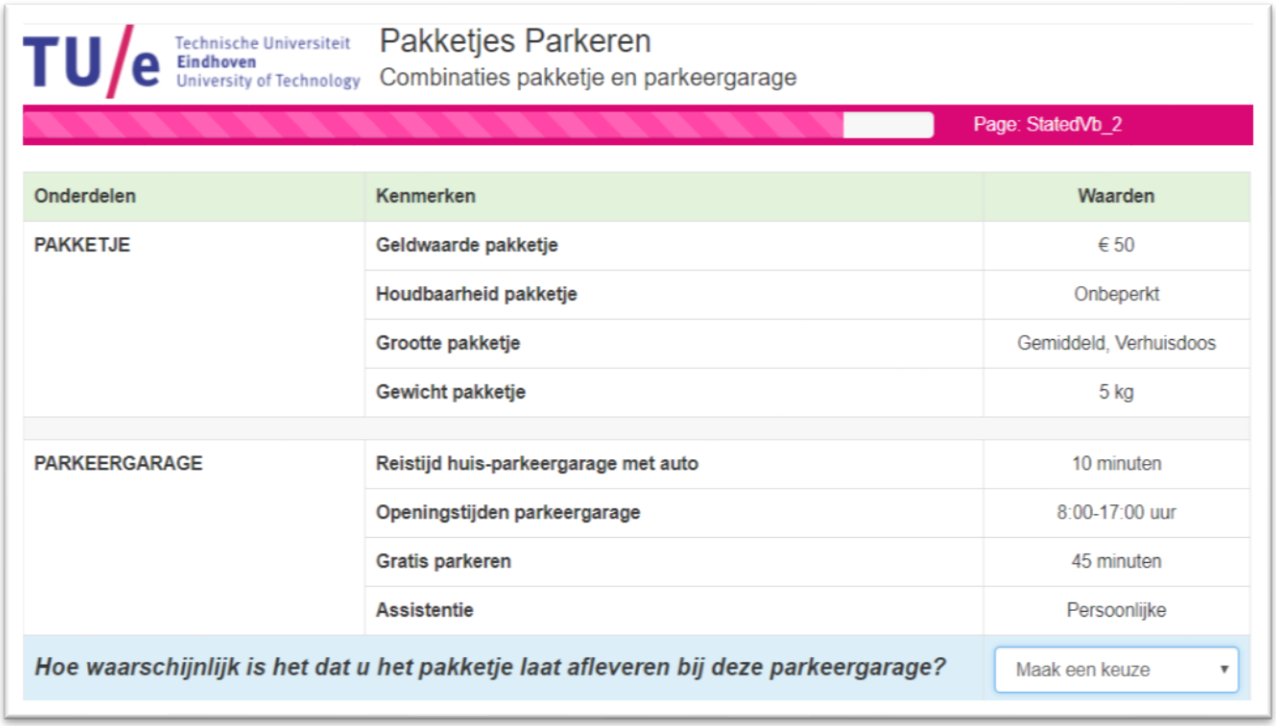


Figure 17. Example of the choice characteristics

To measure the willingness of using parking garage as packaging delivery service there is chosen for the 4-point scale where respondents could choose from: very unlikely, unlikely, likely, and very likely. The 4-point scale consists of an ordinal distribution and measures if a

respondent is willing to make use of the given option or not. The total survey consists of three parts; this is based on a survey setup from section 3.5.

3.4. PREFERENCE ANALYSES

This paragraph describes the preference analyses structure that was chosen for analyzing the survey. An ordinal regression analysis is used for analyzing the preferences of the respondents. The scale of the dependent attribute is divided into 4 categories from very likely, likely, unlikely, and very unlikely.

3.4.1. Ordinal regression

An ordinal regression model is commonly used in social sciences, especially when the scoring scale is ordinal, which was the case in this study. The Ordinal Regression Model is "essentially a set of binary regressions that are estimated simultaneously with constraints on the parameters" (Long & Freeze, 2012). The ordinal regression model was derived from a regression model with an unobserved and continuous variable. This chapter is based on the explanation of Long and Freeze (2012). The formula of ordinal regression is defined as following with as dependent attribute y_i^* (Long & Freese 2012):

$$y_i^* = \beta_0 + \sum_k \beta_k X_k$$

β = Constant
k = Value that is cross attribute index
X= The attribute value

The logit variant of ordinal regression model assumes that β is logistic (or logit) with a mean of 0 and its variance $\frac{2\pi}{3}$. The continuous y^* can be divided into observed, ordinal categories by using the thresholds τ_0 through τ_j, according to the research of Long & Freese (2012): y_j=j if τ_j −1≤y_i^*<τ_j for j =1 to j, where τ_0 =−∞ and τ_j =∞. This means for this study with a 4-points scale that this would become the measurement model:

$$y_i = \begin{cases} 1 \rightarrow ''Very\ unlikely'' & if \tau_0 = -\infty \leq y_i^* < \tau_1 \\ 2 \rightarrow ''Unlikely'' & if\ \tau_1 \leq y_i^* < \tau_2 \\ 3 \rightarrow ''Likely'' & if\ \tau_2 \leq y_i^* < \tau_3 \\ 4 \rightarrow ''Very\ likely'' & if\ \tau_3 \leq y_i^* < \tau_4 = \infty \end{cases}$$

τ_j = thresholds through lowest τ_0 and middle level τ_j. With maximum of j = 4.

Model fitting

The way of evaluation of the regression model is explained more detailed in section 3.6.3.

Log Likelihood

The Log Likelihood (LL) is used to give an indication of how well the model can predict. The value of prediction is between zero and one. The closer the Log Likelihood value comes to zero, the better the predictability is resulting from the model (Sørensen, 2003). Next, to LL method, it is also possible to test the goodness of fit with a Rho-Square value that is explained below. The formula for the Log Likelihood is:

$$LL = \sum_{i=1}^{N} [Y_i \ln(P(Y_i)) + (1 - Y_i] \, ln(1 - P(Y_i))]$$

Where:
Y_i = choice outcome for person *i*
$P(Y_i)$ = probability that Y occurs for person *i*

McFadden's Rho-Square

There are several Rho-Square statistics that can be used to measure the strength of the association between the dependent variable and the predictor variables. The commonly used statistic is McFadden's Rho-Square (R^2). This one is also used for this research:

$$R^2 = 1 - \left(\frac{LL(\hat{B})}{LL(B^{(0)})} \right)$$

Where the $LL(\hat{B})$ Log Likelihood function for the model with the estimated parameters. In this case, it is called LL(final) and the $LL(B^{(0)})$ Log Likelihood is called LL(Null). Rho-Square is used as model prediction method. The value of Rho-Square can vary from 0 to 1. If the value of Rho-Square is equal to 1, the prediction of the observed choices is perfect (Hensher, Rose, & Greene, 2015). Thus, the Rho-Square shows how effective the outcome model (utilities) can predict the actual ratings (choices) respondents made. According to Hensher et al. (2015), a value of at least 0,1 for a discrete choice model, represents a decent model. The formula to calculate the Rho-Square is based on the quantitative method that was written by Osborne (2008). The Rho-Square measures the amount of unpredictability in one variable that is shared by the other.

Log Likelihood Ratio Statistic

Next step is using Loglikelihood Ratio Statistics (LRS) to make a link between the Null model and Finale model. The LRS is Chi-Square distributed and can be used to test if the Final model performs significantly better than the Null model (Hensher et al., 2005). The range from 0 to 1 is used to analyze which model predicts the best. Therefore, the Chi-Square distributed LRS is used. The calculation is as following:

$$LRS = -2((LL(Null) - LL(Final))$$

LL(Final) Log Likelihood function called $LL(\hat{B})$;
LL(Null) Log Likelihood is called $LL(B^{(0)})$.

3.4.2. Dummy coding

To analyze the 'design code' of each of the levels of the attributes as named in 3.2 Attributes survey, the coding needed to be changed in SPSS. For this, dummy coding was used, which is a binary coding method. This method was chosen because SPSS can recode the levels (1, 2, 3) easily into dummy codes. The number of dummy codes needed per attribute is the number of levels minus 1. Membership in a level is coded with one and non-membership in the group, on the other hand, are coded with zero. One group (level) receives only zeros on all dummy codes and becomes the reference category. The dummy coding for this study is shown in Table 5 where the design code represents the original code retrieved from the fractional factorial design generation. Based on the expected results, the lowest level of each attribute was coded as the reference group.

Table 6. Dummy coding

Number of levels	Design code	Dummy coding		Part-worth utility
		X_1	X_2	
3	1	0	0	$0 * \beta_1 + 0 * \beta_2 = 0$
	2	1	0	$1 * \beta_1 + 0 * \beta_2 = \beta_1$
	3	0	1	$0 * \beta_1 + 1 * \beta_2 = \beta_2$
		B_1	β_2	

These dummies are for independent variables of categorical nature in three levels: 1 as low level, 2 as middle level and 3 as high level. Those codings are used to measure the effects of the attribute levels. Interval/ratio level is using the same measurement level. For every variable, dummy coding is used. The reason, therefore, is because we use ordinal variables. However, some of the variables are interval and ratio, though the interval between the chosen scales is the same. To simplify the model by making all the variables the same value and coding it like a dummy, as mentioned in Table 5.

3.5. DATA COLLECTION

This paragraph is about the data collection that has been done for this research. Because the data that is available online at CBS is limited and the provided literature on this subject is also very limited, a survey has been held. The steps and the way this survey was done is explained below.

3.5.1. Survey

This chapter presents the way the survey is held and how the survey was separated into three parts. The first part was about experiences of the respondents with online shopping, the second part was the stated preference experiment dealing with the willingness of using a parking garage as packaging delivery service point and dealing with attributes that may influence the preferences of respondents. The third part included the personal characteristics of the respondents. Those characteristics are explained in chapter 3.3.2, with all the attributes

that are used for this survey, as mentioned in Table 5, Attribute and attribute levels of the survey.

Experiences

The first part of the survey is about the experiences of the respondents. This part is needed to see possible differences between groups of customers that are participating in this survey. This gives a deeper insight into the experiences that people have that may influence their choice decisions. For example, people that never make use of online shopping are suspected to be less interested in the opportunity to have a package delivered at a service point. Additionally, people who never make use of parking garages can be less willing to make use of the parking garage as a delivery point for the package delivery. Therefore, it is needed to have some inside information about the people's experience who participate in this survey.

Therefore, the respondents are asked to fill in the following questions frequency of online orders, used delivery point of ordered purchases, the transportation mode that is usually used to pick up the package when it is delivered at a delivery point, the distance to the delivery point from home and the date of delivery. Some of those questions are based on the frequency and some on the mode. The example of these type of questions can be found in the appendix.

For the optimum result and understanding of the results, it is important to gain insight into the experiences of the respondents. To measure their experiences there are some questions that are related to the personal experiences of those respondents.

Experiment

The task that each respondent should do (selection of one of four answer options from ‘Very unlikely’ to ‘Very likely’ and 9 different choice tasks) is introduced with a description of the included attributes. Below there is the explanation that has been used in the survey. The respondents were first given a short explanation of the attributes and corresponding levels that make the hypothetical situation. Figure 17 visualizes the first set of attributes (describing the package that will be delivered) that are included in the task. A short explanation of those attributes can be found in chapter 3.3.2. Figure 18 presents the attributes of the parking garage that are included in the choice task.

Hieronder vindt u de uitleg van de kenmerken van de pakketjes die in het experiment worden gebruikt.

De pakketjes verschillen op de volgende 4 kenmerken:

1. **Geldwaarde**: waarde van het pakketje: €50 / €250 / €450.
2. **Houdbaarheid**: houdbaarheid van de inhoud van het pakketje:
   - *Kort*: 1 dag, bijvoorbeeld een taart
   - *Lang*: 7 dagen, bijvoorbeeld een doosje eieren
   - *Onbeperkt*: geen houdbaarheidsdatum, bijvoorveeld een boek
3. **Gewicht**: gewicht van het pakketje: 5kg / 10kg / 15kg.
4. **Grootte**: grootte van het pakketje:
   - *Klein*: A3-doos
   - *Gemiddeld*: Verhuisdoos
   - *Groot*: Koelkastdoos

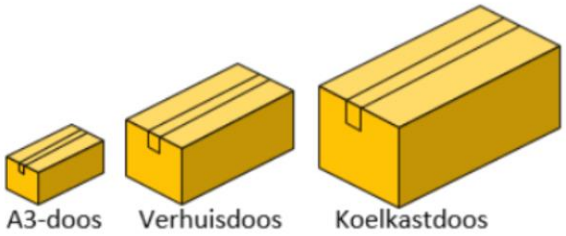


Figure 18. The first part of the explanation, Packaging characteristics

Hieronder vindt u de uitleg van de kenmerken van de parkeergarages als een ophaallocatie.

De parkeergarages verschillen op de volgende 4 kenmerken.

1. **Reistijd** met de auto van uw huis naar de parkeergarage varieert van 5 tot 15 minuten.
2. **Openingstijden** van parkeergarages zijn verschillend:
   - *8:00-17:00 uur*: Openingstijden kantoor
   - *7:00-22:00 uur* : Openingstijden supermarkt
   - *24 uur*: Hele dag geopend
3. **Gratis parkeren** bij het ophalen van het pakketje:
   - *15 minuten*: U mag de eerste 15 minuten gratis parkeren
   - *30 minuten*: U mag de eerste 30 minuten gratis parkeren
   - *45 minuten*: U mag de eerste 45 minuten gratis parkeren
4. **Assistentie** bij het ophalen van een pakketje.
   - *Persoonlijke*: persoonlijke aandacht bij het ophalen van het pakketje
   - *Virtuele*: assistentie via een telefoon/app/intercom
   - *Geen*: geen assistentie bij het ophalen van het pakketje

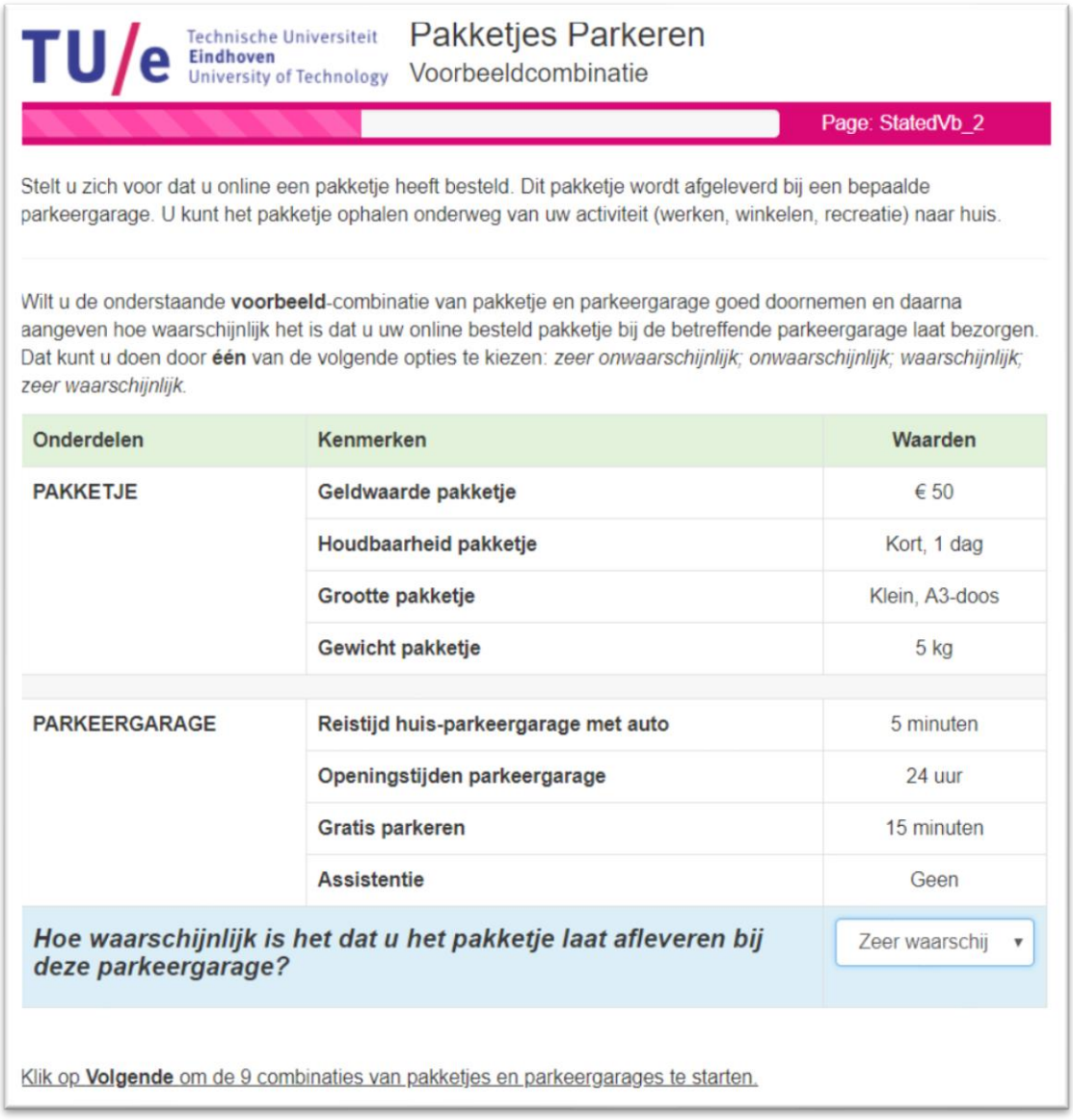
Druk op **Verder** om te beginnen.

Vorige | Verder

Figure 19. The second part of the explanation, Parking characteristics

Next, there was a trial task after which respondents had to proceed with the 9 tasks. In this part, the respondents were asked to indicate if they are willing to make use of the parking garage as PDS. This situation was based on eight attributes. Four attributes were about the parking garage (Figure 18) and four attributes were about the package that they would receive (Figure 17). Based on the given information they were asked to indicate their willingness to make use of the given service, as shown in Figure 19.

Because there may exist different reasons why people do or do not want to make use of the public parking garage as packaging delivery service, there are also some questions asked about the personal characteristics of the respondents.


TU/e Technische Universiteit Eindhoven University of Technology

Pakketjes Parkeren

Voorbeeldcombinatie

Page: StatedVb_2

Stelt u zich voor dat u online een pakketje heeft besteld. Dit pakketje wordt afgeleverd bij een bepaalde parkeergarage. U kunt het pakketje ophalen onderweg van uw activiteit (werken, winkelen, recreatie) naar huis.

Wilt u de onderstaande **voorbeeld**-combinatie van pakketje en parkeergarage goed doornemen en daarna aangeven hoe waarschijnlijk het is dat u uw online besteld pakketje bij de betreffende parkeergarage laat bezorgen. Dat kunt u doen door **één** van de volgende opties te kiezen: *zeer onwaarschijnlijk; onwaarschijnlijk; waarschijnlijk; zeer waarschijnlijk.*

Onderdelen	Kenmerken	Waarden
PAKKETJE	Geldwaarde pakketje	€ 50
	Houdbaarheid pakketje	Kort, 1 dag
	Grootte pakketje	Klein, A3-doos
	Gewicht pakketje	5 kg
PARKEERGARAGE	Reistijd huis-parkeergarage met auto	5 minuten
	Openingstijden parkeergarage	24 uur
	Gratis parkeren	15 minuten
	Assistentie	Geen
Hoe waarschijnlijk is het dat u het pakketje laat afleveren bij deze parkeergarage?		Zeer waarschij ▾

Klik op **Volgende** om de 9 combinaties van pakketjes en parkeergarages te starten.

Figure 20. Frequency buying behavior various products

Personal characteristics

To decide if the recruited respondents represent the Dutch population several characteristics of the respondents are asked. The personal characteristics of the respondents are asked in the survey to gain insight who the respondents are. The personal characteristics like gender,

education, country of residence, and trip visit frequency are significantly related to the distinguished habitual parking behavior (Van der Waerden et al., 2014). Therefore, four different characteristics that may influence the results are included in this research. The four characteristics are gender, education level, age, and possession of a driving license. The results are discussed in the next section 3.5.2. Finally, those characteristics are compared with the average Dutch population, the information from the Dutch Central Bureau of Statistics (CBS).

3.5.2. Distribution

The procedures for selecting and approaching participants in this research were done in two ways. One was by interviewing several field professionals to make sure that the questionnaire would be presentable for the current problems and to retrieve additional insights into this topic. Secondly, the survey was based on the collected information from the literature study with the input of external field professionals in parking and packaging businesses to select the right attributes for the survey. The data was collected through an internet survey that is provided by TU/e and called the Berg System. Respondents were approached through different channels. In this research social media like LinkedIn, Facebook, Instagram, and e-mail addresses were used to distribute the questionnaire as much as possible. This resulted in a limitation of people who are questioned to a certain social circle like work, university, and friends, that are linked directly or indirectly to the researcher of this survey, Sofiya Uralova.

Sample size

Due to the information provided by Rose and Bliemer (2013) who based their findings on Orme (2010), it is suggested to get a minimum sample size of 200 respondents that allows analyzing the differences between sample segments. Rose and Bliemer made an estimating for SP models that suggests using the following equation with the intentional required stated choice 500 as a sample size:

$$N \geq 500 \cdot \frac{L^{max}}{J \cdot S},$$

Where
N = the required number of respondents for a stated choice (SC) experiment;
L^{max} = the largest number of attribute levels;
J = is the number of alternatives in one choice set;
S = is the number of sets that respondents need to make a choice from.

Based on the method of Rose and Bliemer (2013), at least 167 respondents are needed in this research. Here below the equation is shown that is based on 3 attributes per choice, 1 alternative to evaluate per task and 9 tasks that respondents need to evaluate.

$$N \geq 500 \cdot \frac{3}{1 \cdot 9} = 167$$

After having the survey done the minimum required number respondent is met. The results of the survey are explained in the next section.

3.6. RESULTS

This section describes the results obtained with the experiment as presented in the previous sections. The expected result is to get insights into the level of willingness of potential customers. The focus of the research is to find out if the potential customers are willing to make use of the packaging delivery service (PDS) in a public parking garage (PPG). Thereby, to find out the attributes which have a positive or a negative effect on customers' choice behavior. At the end of the research, it will be clear that resistance people are experiences by this approach. The results of those analyses could be used to simulate a GIS model in real life case, for example, Eindhoven city. In the end, there will be a map illustration in Eindhoven, with will visualize the best possible PPG that can be used for PDS.

3.6.1. Sample description

In Table 6 below the characteristics of respondents are summarized that have completed the survey. In total, there were 585 respondents who opened the link to the survey. About a half of those respondents finished the survey. In total, there were 250 respondents who fully completed the survey. Comparing this sample data with the Dutch population, some differences can be noticed. Those differences were already expected, as the survey was held inside the network of the researcher. Those simulation differences are summarized in Table 6 as a percentage and are discussed below in this paragraph.

Table 7. Respondent's data vs Dutch population

Characteristics	Level	Sample Frequentation	Sample Percentage	Dutch Population %
Gender	Men	143	57.2 %	50.2 %
	Women	107	42.8 %	49.8 %
Driving license	Yes	233	93.2 %	80.2 %
	No	17	6.8 %	19.8 %
Education	Non - College	35	14.0 %	60.1%
	Bachelor	93	37.2 %	29.5 %
	Masters - PhD	122	48.8 %	10.4 %
Age	18 – 29 years	120	48.0 %	22.3 %
	30 – 49 years	69	27.6 %	38.2 %
	50 – 70 years	61	24.4 %	39. 5 %
Total		250	100 %	100 %

Respondents

For this research, many people joined the online questionnaire. The survey was open online for 2 weeks, almost 600 people opened the survey link. 24% of respondents stopped after answering few or none of the questions, 33% of the respondents stop after seeing the difficulty of the choice they had to make for this research (facing the trail task). The number of respondents that filled the full questionnaire of 55 questions is 250, that is 42% of the total. For this research we only used the data from the respondents who completed the questionnaire, the rest are excluded from the analysis.

Sample data

The distribution between men and women is almost equal, slightly more men than women. Almost everyone has a driving license (93%). That gives an effective representation of people that can imagine themselves using the parking garage as a drop-off location. However, it is also an advantageous way to have some respondents without drivers' license to check if they as well could be interested, because the parking garages could be available not only for cars but also by foot and eventually by bike. Almost half of the respondents have a master's degree (49%), a bachelor's degree (37%), or another degree (14%). The percentage of the respondents with an age until 29 years is 48%; the other respondents are older. The rest is above 30 years old. This distribution is caused by the network that the researcher of this research has.

Sample vs Dutch population

For the comparison between the respondents in the sample and the Dutch population, the data has been slightly changed. The data that is taken from CBS (2018) and consider the total Dutch population, where everyone between 0 years and 95 years is taken into account. For the comparison, there was a cut made in the age. Only the data of people between 18 and 70 years old is taken into account in this research. This is done to make the distribution more related to the research. The children younger than 18 years are legally too young to order online and people older than 70 years usually do not use of online shopping (CBS 2018)

The gender distributions are slightly the same in the sample as it is for the Dutch population. This might be due to the geographical difference. Because many people in the network of the researcher are students that are studying of finished their technical education. As a result, there are slightly more men than women and the age distribution is younger than average age of the Dutch population. This might explain the shifting in the education percentage.

3.6.2. Experiences description

Before making an analysis of the data, the experience of the respondents should be analyzed. In this chapter the experiences of the survey respondents are summarized. First, it is asked how experienced the responders are with online shopping. Here below the results of the online buy behavior from never until once a week are shown. Those results describe the categories of the three most common online purchases, according to literature research. The three biggest categories are clothes, groceries, and electronics. The category others includes anything with does not fit into one of the previously mentioned categories. As is shown in Figure 21, those categories are presented in a graph and described per category below.

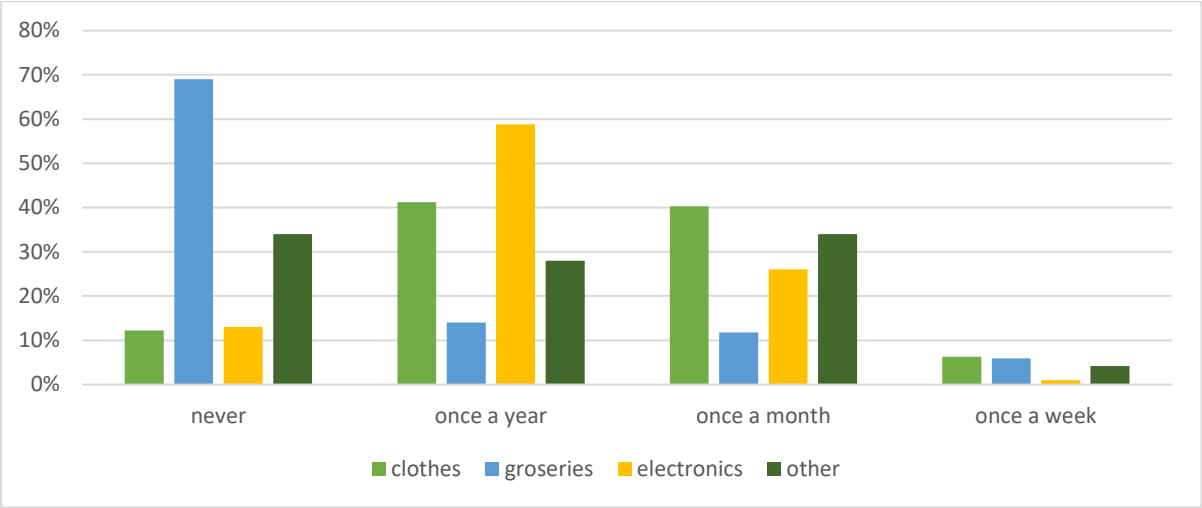


Figure 21. Frequency buying behavior various products

Clothing

Clothes are the most common item that is ordered online. Almost all of respondents (88%), order clothes online at least once a year. Some of the respondent's order clothes every week, around 6%. The total amount of the ordered clothes online is rising every year, so this number might growth coming years (CBS, 2016).

Groceries

Based on the results of the questionnaire it is possible to conclude that groceries are the least online chosen part of all articles. Around 70 percent of all respondent have never ordered groceries online. However, it also to see that those who do order online are almost evenly distributed across once a year, once a month, and once a week. This might be due to every day need to have food on the table and the convenience of it.

Electronics

The electronics are ordered at least once a year by about 60% of the people. This is the most common item that is ordered at least once a year, and the least common once a week. This might be due to the possibility of the ordering and the cheaper and easier comparison via the internet. However, there are not many people that are willing to buy electronics every week, only 1% of all the respondents are willing to order every week. This might be due to a job or special needs of an individual.

Other

There is a significant difference in how much people order other online. Most of the people never order online (35% of the total). 28% ordering online once a year and more than half of those people order books (41%), few (12%) order household goods and 15% order personal care items, only a few did not say what they order 'other' category in a year. Many people order something online once a month. Some people have chosen for books (11%), 6% for household items and 10% for personal care, as mentioned in Figure 22.

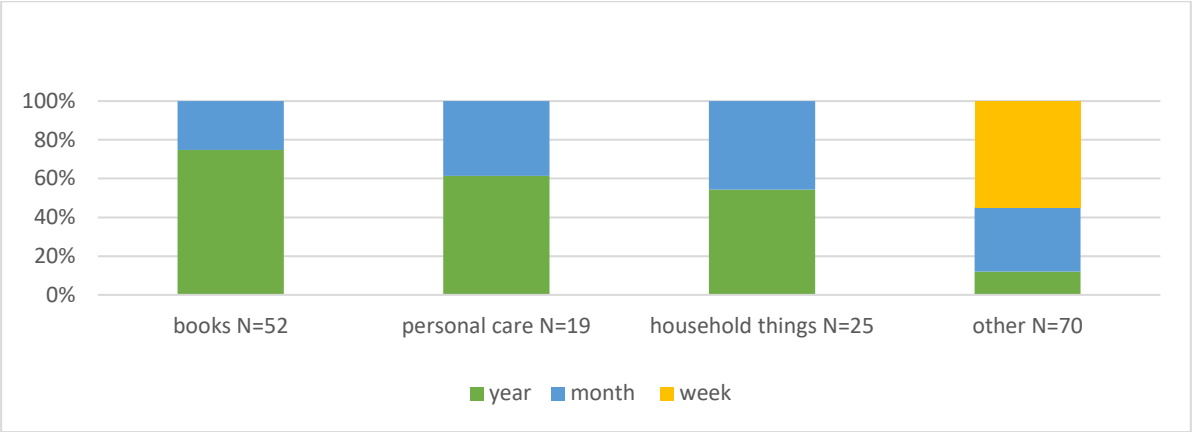


Figure 22. The ordered frequency of category 'other'

Next to online ordering experiences is also important to know what the preferences are. To get to know what the preferences could be, there are three questions formed forget to know what the preferences are of the respondents. Each of those questions is described below.

Preferences of packaging delivery

Here below some questions are summarized regarding the online ordering preferences and the delivery attributes. There are 3 main reasons why people choose to do what they do. Those reasons are explained using the percentage of respondents who selected the reason. To have deeper inside in those questions, there is a need to know what responders mean by answering 'other' as many have answered it. Therefore, those facts are analyzed by summing up all the written answers that there were given and summarized as the last part as 'others'.

Table 8. The reasons for having an online ordered package delivered at a pick-up point

REASON 1	PERCENTAGES
LOCATION	82%
TRAVEL TIME	72%
DELIVERY COSTS	64%
OTHER	42%
CERTAINTY	16%

The most common reasons to have a package delivered at a pick-up point are the location, travel time, and delivery costs. The reason 'other' covers 42%. And only 16% of the respondents are uncertain about delivery at pick-up point because they are unsure of the package delivery advantages.

Table 9. The reasons for NOT delivering an online ordered package at a pick-up point

REASON 2	PERCENTAGES
PRIVACY	83%
TIME	55%
LOCATION	44%
OTHER	17%

After knowing what the reasons are to use or not to use a pick-up point, the respondents were asked if they think to have their package delivered at parking garage as a pick-up point. The most common answers were slightly different.

For the same reasons, people would have their package delivery at a delivery point, they would not like to get their package delivered at a parking garage delivery point. Thereby it is possible to conclude that those three reasons are the most important for the most people. It seems like people are more likely to have their package delivered at a pick-up point, as they do see some advantages of it. The characteristic like time and location are still the most common reasons that also were found in literature research. However, the privacy aspect is the most uncertainty factor by delivering at the parking garage. This might be the unknowing aspect for the customers to use PPG as PDS possibility, as it not common yet. Additionally, the respondents were asked to feel in the possible advantages that they might see to use PPG as PDS. Therefore, the following answers have been given:

Table 10. The advantage of a parking garage as a pick-up location for online ordered packages

REASON 3	PERCENTAGES
TIME	73%
LOCATION	72%
OPENING HOURS	57%
OTHER	23%

All the answers included in the last reason 'other' are that no one sees the advantages of the parking garage. So, everyone has one or more reasons to not delivering the package at the parking garage. Therefore, some of the answers were slightly more explained with the reason why not. The reasons why they do not see positive reasons are explained here below. Most common reasons are: there is always someone home, 27 people see no reason to deliver it to the parking garage at all, without any other explanation. Only view people see it as an extra option and possibility to same time so you don't have to wait home.

Table 11. Top 3 most common answers

#	Reason 1	#	Reason 2	#	Reason 3 NO	#	Reason 3 YES
27	the comfort of no need of being home and waiting	16	easy delivering home, not willing to pick it up somewhere rather than home	2	have no car	4	there is a parking garage next to my home
9	to broad delivery time provided	10	limited opening hours	3	there is no parking garage nearby	1	no need waiting home
8	no reason or need use it	8	size of the package	27	no reasons to deliver it in the parking garage	2	wide opening hours

In Table 10, the 3 most common reasons are described that customers answered about the idea of having their package delivered at the parking garage. Most of the respondents (27) reacted with a reason of that having their package delivered at PDS is very comfortable due to no need of being home and waiting until the package will arrive. Additionally, some of the

respondents do not see the purpose of staying home and waiting until package will arrive. The most common reason is the broad delivery time that most delivery companies have. So consumers are unsure when the package will arrive. Sometimes the package does not arrive at the day it was told. So, to spare some time and not having to be attached to staying home and waiting until the package will arrive, it is easier to send it to a PDS nearby and pick it up at the time that suits most. Therefore, one of the reasons why one will send a package to a PPD is because of the wide opening hours. It is also the reason why some of the respondents do not want to have their package delivered at a usual PDS, limited opening hours.

The most common reason to have a package not delivered somewhere else rather than at home is that most people think that home delivery is much easier. They prefer the package delivered at home rather somewhere else. Most of the respondents that never send a package to a PDS are the ones who live with others. So, those respondents have at least one person at home that can stay home and can easily receive the package. Likewise, a package size does matter, because if the size is bigger than a reasonable size to carry with you or too heavy, the person is more likely to have the package delivered at home.

The reasons to not make use of a parking garage as a PDS are usually because one does not have a car or there is no parking garage nearby the house. Some of the reactions were that they do not see a possibility or a beneficial reason to make use of this possibility, with no other explanation added to.

3.6.3. Model analysis

The SPSS output with Parameter Estimates of each attribute and the associated level of significance is generated based on the survey outcomes. In this output, there are 5 significant attributes. Four of these have a negative influence and one has a positive influence on the probabilities of the possible answer options. The significant values are described below by means of visualization in a graph. To achieve a preferable prediction, a 90% confidence interval is used to identify the significant parameters, as mentioned in Table 12.

The values of the estimations lead to the calculation of the goodness of fit of the model. Each attribute has its own contribution. By choosing one of the attribute levels the value of the estimation can change, the higher the level, the bigger the usefulness. This usefulness can be both negative and positive ranging from -1 to 1. Utilities are linked to a total utility value, which can be used to calculate the total chance, in this case the chance of likeliness.

Table 12. SPSS output of Parameter Estimates of each attribute

Parameter Estimates

Attributes	Levels	Estimate	Sig.
package value	[prop. Value, € 450]	-.354	.000
	[prop. Value, € 250]	-.165	.088
	[prop. Value, € 50]	0[a]	.
package shelf life	[prop. Short, 1 day]	-.374	.000
	[prop. Long, 7 days]	-.310	.001
	[prop. Unlimited]	0[a]	.
package size	[prop. Big, freezer size]	-.648	.000
	[prop. Average, transport box]	.065	.497
	[prop. Small, A3-format box]	0[a]	.
package weight	[prop. Weight, 15 kg]	-.051	.602
	[prop. Weight, 10 kg]	.015	.880
	[prop. Weight, 5 kg]	0[a]	.
travel time	[prop. 15 minutes]	-.332	.001
	[prop. 10 minutes]	-.292	.003
	[prop. 5 minutes]	0[a]	.
opening hours / service duration	[prop. 24 hours]	.642	.000
	[prop. 7:00-22:00 hours]	.633	.000
	[prop. 8:00-17:00 hours]	0[a]	.
free parking	[prop. First 15 minutes]	-.072	.463
	[prop. First 30 minutes]	.074	.449
	[prop. First 45 minutes]	0[a]	.
assistance	[prop. No assistant]	-.085	.385
	[prop. Personal assistant]	.128	.190
	[prop. Virtual assistant]	0[a]	.

a. This parameter is set to zero because it is redundant.

In yellow is highlighted the significant variables of characteristics

Model fitting

The model fitting information (performance of the model) shows that the model is better than the model with only one constant/intercept (a model with only a constant and no attributes). The alternative specific constant influences alternatives and has nothing to do with the other more specific attributes. To know if the model is worth looking at and if it is possible to make a valid prediction with it, the Log-likelihood Ratio Statistics is calculated. First, LL ratio is calculated to see if the model outperforms the constant-only model. Next, R^2 is calculated to see if the model is able to predict the observed choices. Those calculations are made based on the prediction generated by SPSS.

Model performance

There are two LL-values needed to determine the performance of the final mode:

1. Null-model LL (all parameters equal to zero),
2. Final-model LL (all parameters estimated).

In principle, there are 4 answer options (Very unlikely, Unlikely, Likely, and Very likely). In this case, as a result, the null model has a 25% chance of each answer option. That results in the following equation of the Log Likelihood:

$$LL\ Null = 1{,}386*1*ln\ (0.25) = -1.386 * 2250 = -3{,}119.16$$

$$LL\ Final = \sum_{i=1}^{N} [Y_i\ ln(P(Y_i)) + (1 - Y_i]\ ln(1 - P(Y_i))]$$

The LL Final has every time a different change of Y_i, that varies per individual. Therefore, the LRS is calculated using the predictions of SPSS. LRS is the Chi-Squared distributed. This means that it can be tested with the Chi-Square test.

Chi-Square test, first it is necessary to know what the zero hypothesis is. When is the model with no predictors adequate? The final model performs relative better than the model with no predictors. The p-value in this model is 0.002 and 0.001 so, compared to Null-model with no predictors this model does predict the observed choices significantly better.

The p-value is 0.002 that means that it is significant. The fit of the model is tested but using non-significant as an indicator of goodness of fit. In this case, the sign is very high, so it does mean that the model is not a good fitting model.

Figure 23. Prediction distribution, df =16

The df-value of 16 is the value that represents the number of estimated parameters, two for each three-level attribute (see dummy coding scheme). Therefore, it is 2x8 that equals 16. Because this research has 16 degrees-of-freedom the minimum level of the critical chi-square value should be at least 26.3 or higher.

To compare the goodness of fit of two statistical models, in this case, the null model against the final model, the Log Likelihood ratio statistic (LRS) is used. The LRS is calculated according to the formula presented before. Below, the elements of LRS are filled in.

$$\text{LRS} = -2(-3119.16 - 2681.01) = 876.304$$

The LRS is equal to 876.304 which is significantly higher than 26.3 (the minimum level of the critical value) indicating a significant difference between the null model and the final model.

$$R^2 = 1 - \frac{2681.010}{3119.162} = 0.1405$$

Next, the R-square value is calculated (see paragraph 3.3.2. for an explanation of how it is calculated). The R-square value is equal to 0.1405. This is relatively low when looking at the predictive power of the model.

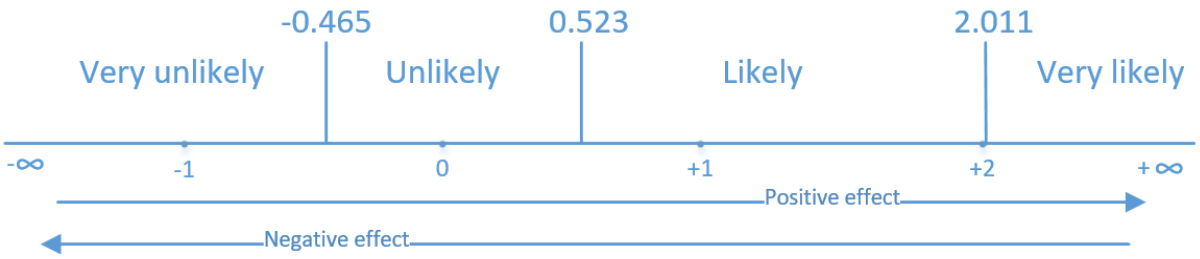


Figure 24. Threshold prediction of likelihood

Based on the threshold, the model predicts that unlikely situation has a negative result and likely has a positive prediction on the model. Based on this model, it is possible to say that in this case, the model tends to in the direction of unlikely.

The observed evaluation of likelihood differs in percentage in this research. The Figure 22 above shows the percentage and the number that respondents made. Most of the respondents 70.4% have chosen unlikely that they will make use of parking garage facility as a packaging delivery location, and 29.6% gave an answer as it is possible for them to choose it.

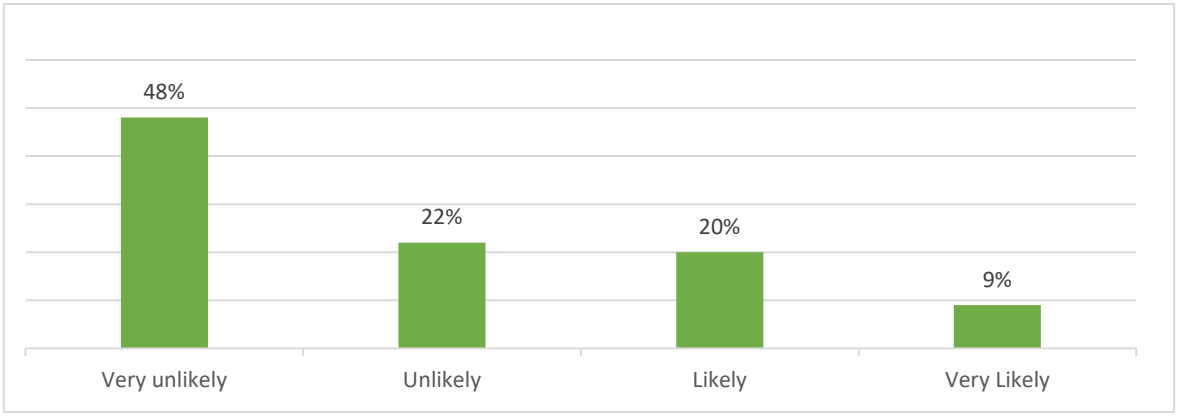


Figure 25. Observed evaluations

The first variable is the **value of a package** that has a significant effect on the model. This effect is negative and becomes shows that the probability of an answer tends to go in the direction of Very unlikely when the value of the package is higher. The utility part is the focus here. When the value of the package increases, then it increases of utility. In this case, it has a negative influence, and the more negative this becomes, the more negative this affects prediction. Accordingly, the contributions of package value become increasingly negative as this value becomes higher.

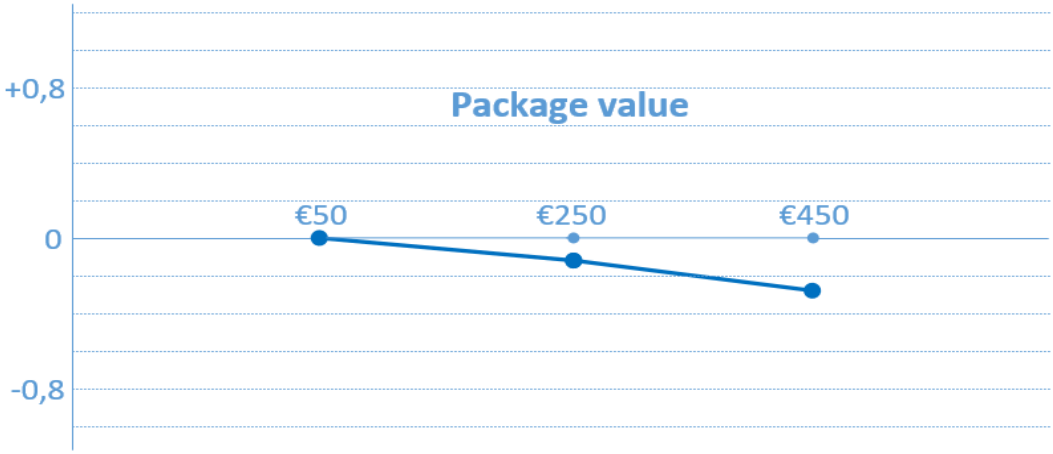


Figure 26. Package value probability

The second variable is significant from the start concerns **the shelf life of a package**. In this case the shorter the shelf life the higher influence. Here below is the graphic shown how it looks like.

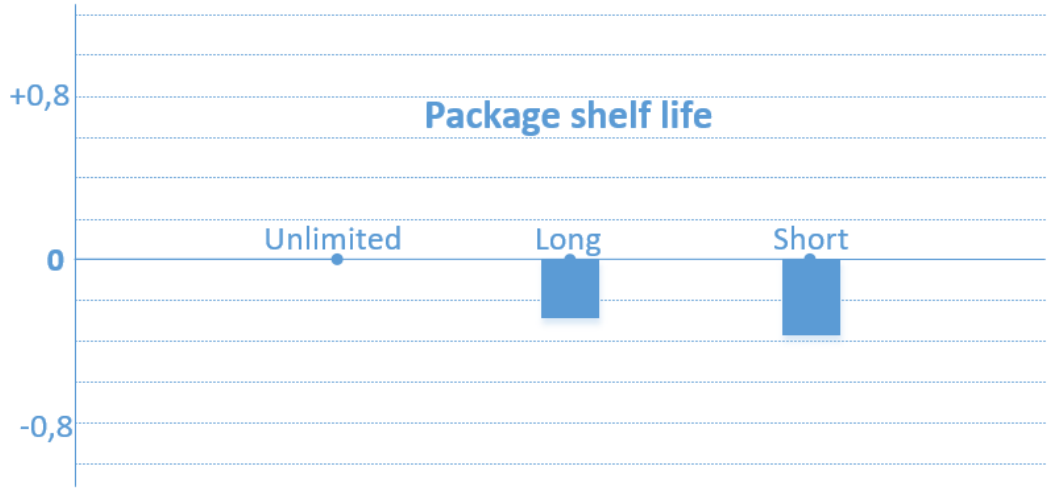


Figure 27. Package shelf life probability

The next variable **is the travel time** variable. This has a significant value from the beginning. The longer travel time that results in a more negative effect on the model. So, the longer one should be traveling to the parking garage to pick up a package that results in the higher

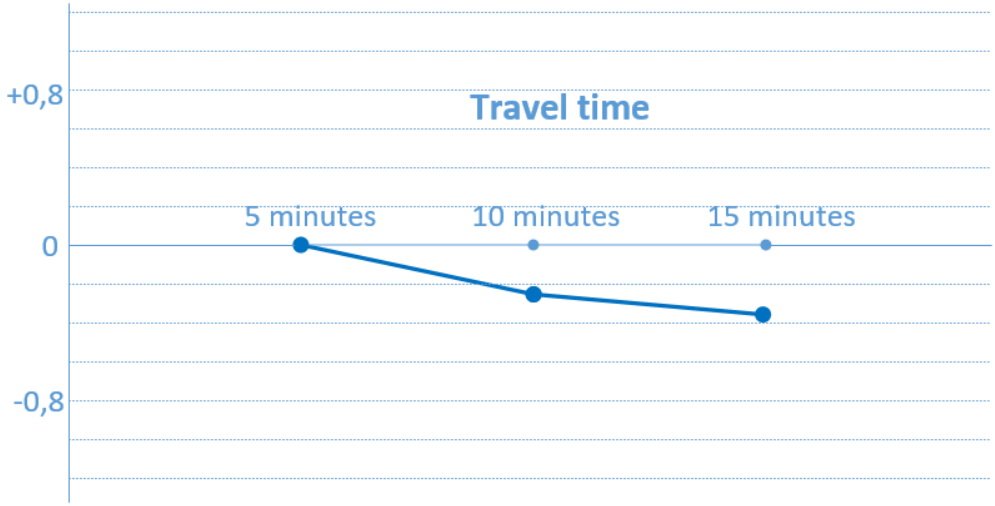


Figure 28. Travel time probability

negative result on the willingness to travel to the parking garage. 5 minutes are durable and there more one will travel to the parking garage the less one is willing to deliver a package there.

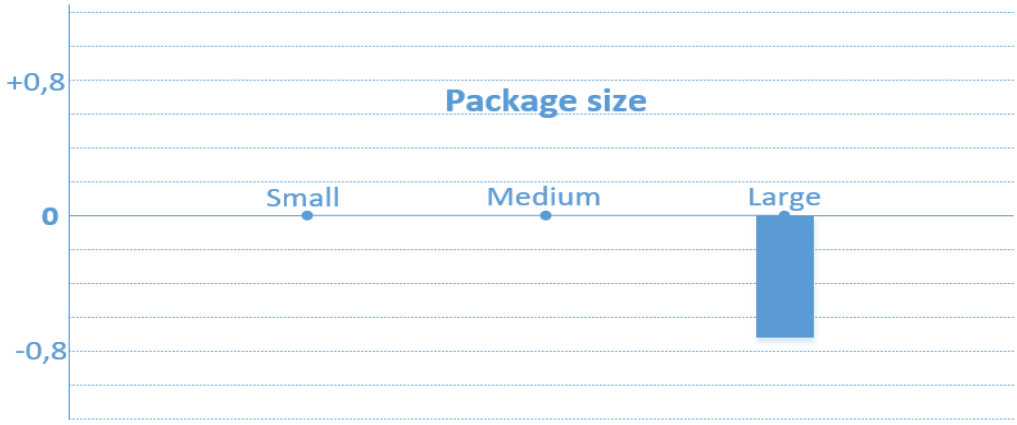


Figure 29. Package size probability

The last negative variable in this mode is **the package size**. Due to the results and to the answers respondents were given in the survey, the size of the package does have a significant value. However, in this case, correspondents were considering that if they are going to pick up a package in a parking garage, they are will be willing to do it by car. So, the size does not matter until it gets so big that it might not fit into an average car. In this case, it was a large package, that for example could be a freezer box.

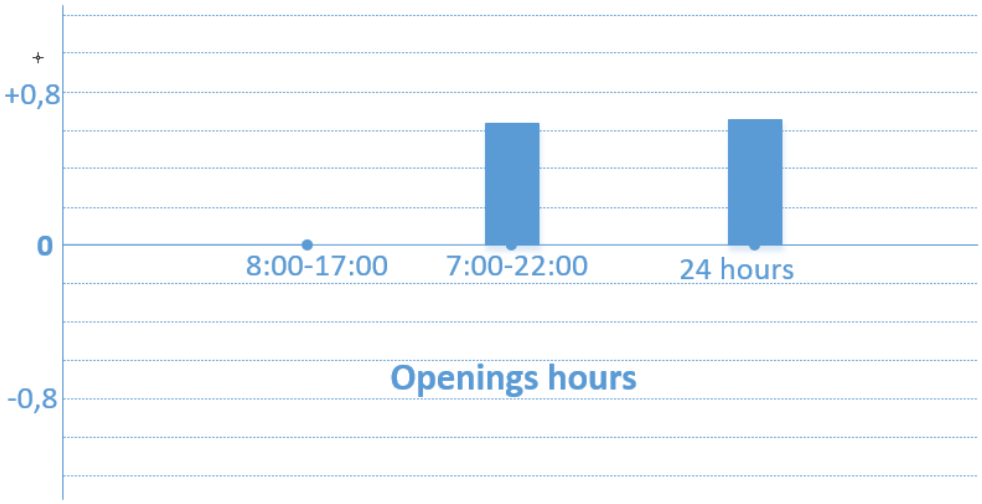


Figure 30. Opening hours probability

The last attribute is the only one that has a significant positive outcome to the parking garages use as **packaging delivery service**. It is about the time that online shoppers can pick up their package after ordering it. Regular hour as office hours does not have any effect, however when they pick up ours getting extended there more willingness people that they will pick up the package there. Night hours are having slightly more efficient, but it is not that different from the hours from 7 am to 10 pm.

Conclusion

Concluding, all those attributes have a significant influence on the choice behave. However, some of them have a much higher influence than others. For instance, most of the negative outputs have value around -0.354, only the package size has a significantly bigger value of -0.648. This could be because the level of the package size is token so big that it could not be fit in an average car, therefore this can be also concluded as a very reliable survey output where attribute levels counted very well into choice consideration of respondents. Additionally, the second most influential attribute on customer behavior is the opening hours of the parking garage with a value of 0.642 for 24 hours and 0.633 for opening hours from 7 am up to 10 pm.

3.7. SITUATION EXAMPLE

As an example, two hypothetical situations are defined: one as least favorable and one as most favorable. Considering both cases, the attributes that are needed to be considered have mostly a negative contribution to the probability of the answer categories. The only positive attribute is the wide opening hours that can be provided by a parking garage. This attribute influences customers positively to let the package be delivered at a parking garage. The two situations are explained and detailed below. The way the probabilities are calculated is according to chapter 4 of the book of Norušis (2011): prob(event j) = 1 / (1 + $e^{-(\alpha_j - \beta x)}$). That means that β is 0, and all you have to worry about are the intercept terms. If prob(score = j) = prob(score less than or equal to j) – prob(score less than j). Five of eight attributes that are included in this research are significant when looking at the choice making of customers. The utilities and resulting probabilities are calculated for the two hypothetical situations, as mentioned in Table 13.

Table 13. The least favorable situation

Attributes	Levels	Estimated value
Package value	€450, -	1*-0.354+0*-0.165 = -0.354
Package shelf life	1 day	1*-0.374+0*-0.310 = -0.374
Package size	Big	1*-0.648+0*-0.065= -0.648
Travel time	15 minutes	1*-0.332+0*-0.292 = -0.332
Opening hours	8:00 – 17:00	0*-0.642+0*-0.633 = 0.000
Total utility		**-1.708**

To calculate the probability of the least favorable situation, the five significant attributes are used with the most negative values. The calculation shows how high the chance is that this situation will be preferred in real life according to the survey. Considering that all five attributes will appear in real life case the calculated utility is equal to -1.708. To calculate what the likelihood is that one will use this parking garage as PDS with all those attributes levels it is necessary to divide the answer into four different answer options. Those answer options score from 1 to 4:

Score 1 = Very likely ***Score 2 = Likely*** ***Score 3 = Unlikely*** ***Score 4 = Very unlikely***

The probabilities of those scores are calculated according to the theory of Norušis as explained and shown below.

prob(score 1) = 1 / (1 + $e^{2.011}$) = 0.1181
prob(score 1 or 2) = 1 / (1 + $e^{0.523}$) = 0.3722
prob(score 1 or 2 or 3) = 1 / (1 + $e^{-0.465}$) = 0.6142
prob(score 1 or 2 or 3 or 4) = 1

……

The summation of those calculations is visualized in Figure 31.

prob(score = 2) = prob(score = 1 or 2) – prob(score = 1) = 0.2541
prob(score = 3) = prob(score 1, 2, 3) – prob(score 1, 2) = 0.2420
prob(score = 4) = 1 – prob(score 1, 2, 3) = 0.3858

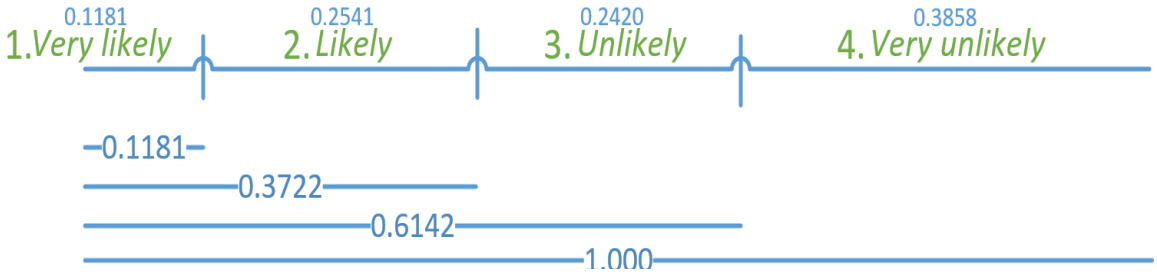


Figure 31. Likelihood distribution of the least favorable situation

Based on this technique, it is possible to conclude that under the most unfavorable circumstances the percentage of car drivers that are not willing to use the parking garage to pick up the package is equal to 63% (including very unlikely and unlikely). The prediction of very likely is low (12%), and prediction of likely is equal to 25%. Additionally, in this 'unfavorable' situation, the prediction of unlikely is higher than the prediction of likely (difference 36%). In addition, it is interesting to know how people will react to the hypothetical combinations in the most favorable situation as explained here below.

Table 14. The most favorable situation

Attributes	Levels	Estimated value
Package value	€50, -	0*-0.354+0*-0.165 = 0.000
Package shelf life	Limitless	0*-0.374+0*-0.310 = 0.000
Package size	Small	0*-0.648+0*0.065 = 0.000
Travel time	5 minutes	0*-0.332+0*-0.292 = 0.000
Opening hours	24 hours	1*0.642+0*-0.633 = 0.642
Total utility		**0.642**

To calculate the probability of the most favorable situation the five significant attributes are used with the most positive estimated value. By summering those value, the estimation of this prediction is positive (0.642), but less strong than in the case of the least favorable situation (-1.708). This is due to the attributes that four of the attributes are negative and only one (opening hours) is positive. The prediction of willingness for this situation is calculated below.

prob(score = 1) = 1 / (1 + $e^{2.011-0.642}$) = 1/ (1+$e^{1.369}$) = 0.2028
prob(score = 1 or 2) = 1 / (1 + $e^{0.523-0.642}$) = 1/ (1+$e^{-0.119}$) = 0.5297
prob(score = 1, 2, or 3) = 1 / (1 + $e^{-0.465-0.642}$) = 1/ (1+$e^{-1.107}$) =0.7516
prob(score = 1, 2, 3, or 4) = 1

……

The summation of those calculations is visualized in Figure 32.

prob(score = 2) = prob(score = 1 or 2) – prob(score = 1) = 0.3269
prob(score = 3) = prob(score 1, 2, 3) – prob(score 1, 2) = 0.2219
prob(score = 4) = 1 – prob(score 1, 2, 3) = 0.2484

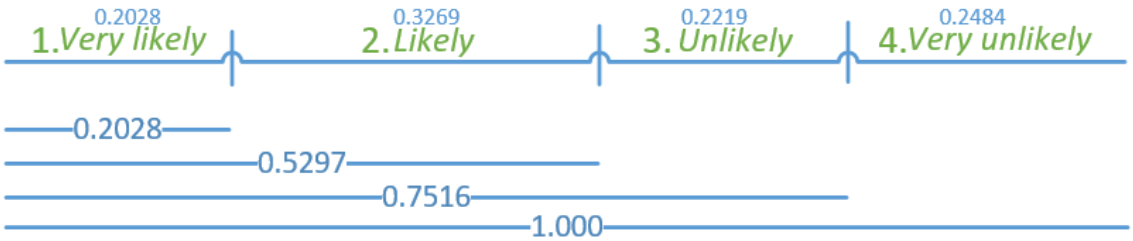


Figure 32. Likelihood distribution of the most favorable situation

These are the probabilities of being selected. So, the probability of the answer category 'Very Unlikely' is in the case of a most favorable situation equal to 0.248 (or 25 percent). This percentage is considerably lower than in the case of the least favorable situation. Range - collection, which indicates a range that catches up the highest and the lowest values. In this situation, it is possible to conclude that the probability that one will choose a parking garage as a delivery point for this package is equal to 53%. So, the chance is higher to be likely than not likely. This could be marked, as the situation has the lower possibility to be than less favorable. In comparison, this is still not that bad taking into account that currently, most people (approximately 90%) like to have delivered their package home (CBS 2016).

3.8. ADDITIONAL ANALYSES

This chapter is about the additional analyses that are made based on the knowledge and the given data from the survey to see if there are differences between groups of respondents. Grouping is based on the following characteristics:

1. Urban density;
2. Randstad;
3. Distance to PPG,
4. Households;
5. Gender;
6. Age;
7. Education.

For each way of grouping the description of the analysis is subdivided into three parts. The first part concerns the percentage of measured willingness to use a parking garage as packaging delivery service. This is measured on a four-point scale. The respondents could

choose from very unlikely, unlikely, likely and very likely. The second part is about the estimation of each attribute, including the significance of each attribute per group. The thirst part is about the distribution of the parameters per group, to have a visualization of each attribute. Furthermore, each group is divided into two. The reason for this distribution is due to the availability of the data. As there are only 250 respondents, dividing the data into more than two groups makes the model estimation less reliable. By splitting the data set in two parts, it is still reliable to estimate proper models. Splitting data in more than two groups will make data poor and unreliable for this research, as there will be not enough respondents.

Additionally, the significance of those attribute is set at 90% certainty level. The attributes that have lower significance are not considered. Based on the data from the respondents who have filed in the survey and by using the ordinal regression to do analysis differences and preferences between multiple groups. The first groups are about the geographical attributes like urbanization density and distance to the nearest PPG. The second group is about personal characteristics, like age and gender.

Urban density

The first analysis is based on the type of environment respondent live in, represented by the term urban density. Therefore, it is possible to analyze if there is a difference between people who live in high urban density or low urban density areas. Based on the address density, each neighborhood, district or municipality is assigned to an urbanization class. The following classification of urbanization has been used by the CBS (CBS, 2018):

1: very high urban density> = 2,500 addresses per km²
2: high urban density 1,500 - 2,500 addresses per km²
3: moderately urban density 1,000 - 1,500 addresses per km²
4: low urban density 500 - 1,000 addresses per km²
5: very low urban density <500 addresses per km²

The data from the survey is split into two parts high urban density and low urban density. According to CBS, the urban area covers 1,500 addresses or more per km². In this case, it covers the first two classes, 1 and 2. The rural area includes areas that have 1 000 addresses per km² or less. In this case, the last two classes, 4 and 5. There is one class in between that does not belong to either the urban nor the rural area. Based on the given data, it is only possible to use the urban part of the data, as there is not enough data to make an analysis for the rural areas. Most respondents (72%) live in urban areas and only 15% lives in rural areas. Therefore, there are not enough data to make predictable and reliable statements about the people who are living in rural areas.

For this research, a distribution is made for two predictors. The first covers very strong urban density that require 2,500 and more addresses per km² and the second includes less strong urbanization density that has less than 2,500 addresses per km². This distinction is made to see the difference between respondents who live in high-density areas that have all the necessary facilities close to home, and respondents who live in less urban density areas in the Netherland.

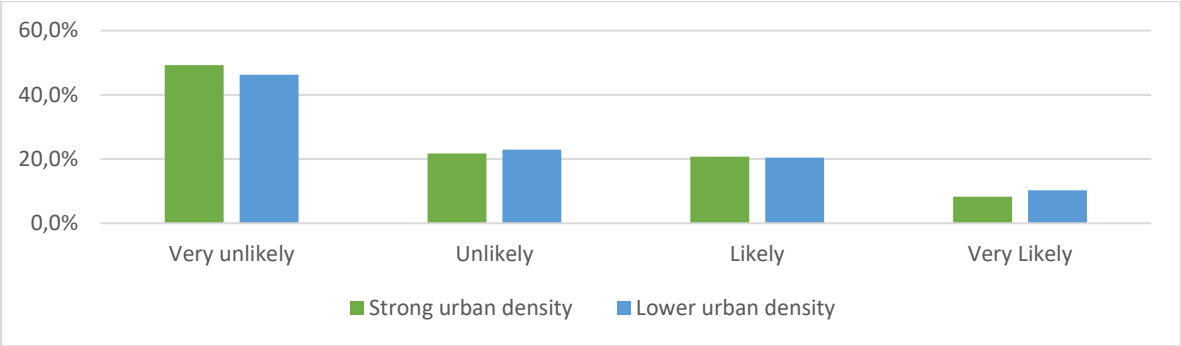


Figure 33. Urban density

Above, the distribution of the answer options (in percentages) of the two sub-groups is given. There is a slight difference visible between the two groups. As the figure above shows, people in lower urban density areas are slightly more likely to make use of PDS in PPG than people living in higher urban density areas. Here below there are the attributes summarized that make a difference between those groups.

The significant attributes are colored in Table 15 below. In general, the parameter table is comparable with the one made before (overall model). However, there are a few differences between the overall model and the urban density specific model. The first one concerns the 'travel time' attribute. For this attribute, it holds that the respondents who live in strong urban density areas are not finding this attribute significant. In contrast, respondents living in the lower urban areas find it very significant; the further away from the parking garage the more negative influence on the decision.

The second important difference compared with the overall model, concerns the significance of the attribute assistance. This attribute is only significant for respondents who are living in lower urban density areas. In this case, having personal assistance has a positive influence on decision making.

Table 15. Parameter estimates of urban density

Parameter Estimates

Attributes	Levels	Strong urban density		Lower urban density	
		Estimates	Sig.	Estimates	Sig.
package value	[prop. Value, € 450]	-,170	,217	-,136	,328
	[prop. Value, € 250]	-,330	,016	-,429	,003
	[prop. Value, € 50]	0[a]		0[a]	
package shelf life	[prop. Short, 1 day]	-,348	,011	-,436	,003
	[prop. Long, 7 days]	-,375	,006	-,271	,057
	[prop. Unlimited]	0[a]		0[a]	
package size	[prop. Big, freezer size]	-,574	,000	-,798	,000
	[prop. Average, transport box]	-,049	,719	,145	,290
	[prop. Small, A3-format box]	0[a]		0[a]	
package weight	[prop. Weight, 15 kg]	,188	,172	-,165	,239
	[prop. Weight, 10 kg]	,090	,516	-,174	,222
	[prop. Weight, 5 kg]	0[a]		0[a]	
travel time	[prop. 15 minutes]	-,096	,486	-,594	,000
	[prop. 10 minutes]	-,216	,117	-,550	,000
	[prop. 5 minutes]	0[a]		0[a]	
opening hours / service duration	[prop. 24 hours]	,590	,000	,700	,000
	[prop. 7:00-22:00 hours]	,508	,000	,738	,000
	[prop. 8:00-17:00 hours]	0[a]		0[a]	
free parking	[prop. First 15 minutes]	-,085	,536	-,022	,879
	[prop. First 30 minutes]	,057	,678	,107	,444
	[prop. First 45 minutes]	0[a]		0[a]	
assistance	[prop. No assistant]	-,125	,365	-,026	,854
	[prop. Personal assistant]	,040	,772	,253	,074
	[prop. Virtual assistant]	0[a]		0[a]	

Link function: Logit.

a. This parameter is set to zero because it is redundant.

In yellow is highlighted the significant variables of characteristics

Those numbers are representing all the respondents who live in strongly urbanized areas. The numbers of parameter estimates are not very different from those made by using all the respondents. So, excluding the respondents who live in less urbanized areas from this analysis does not have much influence on the outcomes of this research. Therefore, it is possible to conclude that the people from strongly urbanized areas have the same outcomes as the total number of respondents in this research. According to the threshold of these subgroups, the deviation between the high and the low density of urbanization there is a big difference in the distribution, as mentioned in Figure below.

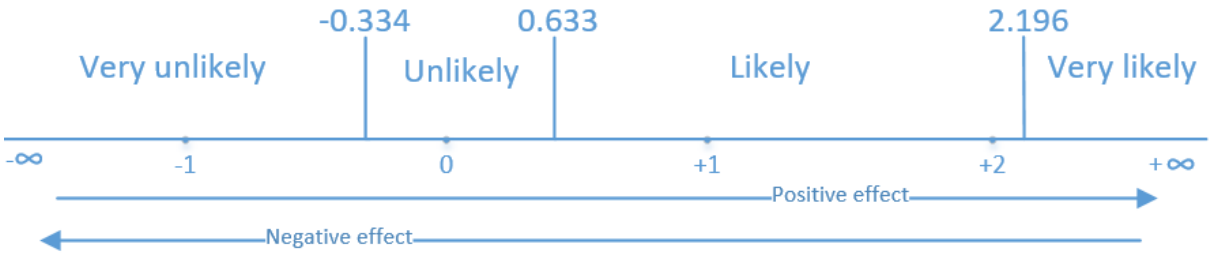


Figure 34. Prediction high urban density distribution

People have a strong opinion on likability. There is a high possibility that this group will not make use of PDS in PPG. The group has a very large deviation in very unlikely, a small one in unlikely and very likely, and a very large deviation in likely. In comparison with the low urban density group that has a more positive distribution direction to likely.

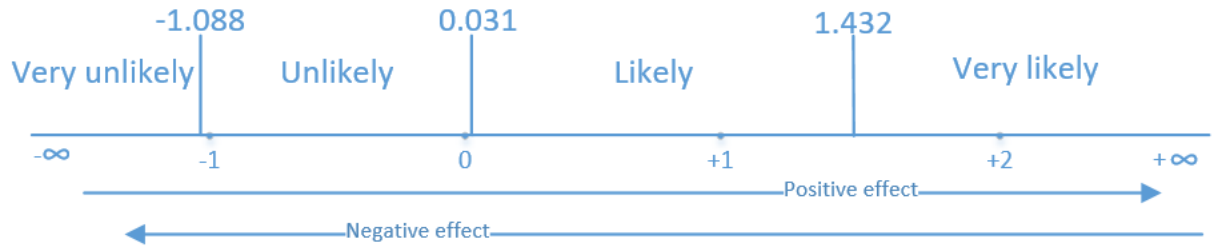


Figure 35. Prediction low urban density distribution

The group of low urban density has a more spread distribution between likely and very likely, so this group is much more willing to make use of PDG in PPG than the people who are living in high urban density.

The difference between those two sub-groups concerns the distribution between threshold parameters and the preferences. As it was estimated that people who live in high-density urban areas are more willing to make use of the PDS in PPG than people who live in lower urban density areas. The reason for this was the possibility to pick up package nearby the house. However, it could be explained that people who are living in high urban density areas already have enough options to have their package delivered.

Randstad vs outside Randstad

The second analysis focuses on differences between Randstad and outside Randstad. The Randstad covers the four biggest cities of the Netherlands, Amsterdam, Utrecht, Rotterdam and Den Haag and all addresses located in between these cities. The respondents are evenly distributed and therefore, it makes it beneficial and easy to compare those two groups of respondents. According to the data from the survey, the respondents living outside the Randstad are more likely to make use of PDS in PPG than respondents living in the Randstad. This conclusion is partly the same as presented in the previous subsection, where people from high urban density areas are less likely to make use of PDS in PPG than people from low urban density areas. This analysis supports the conclusion that is made in the previous section.

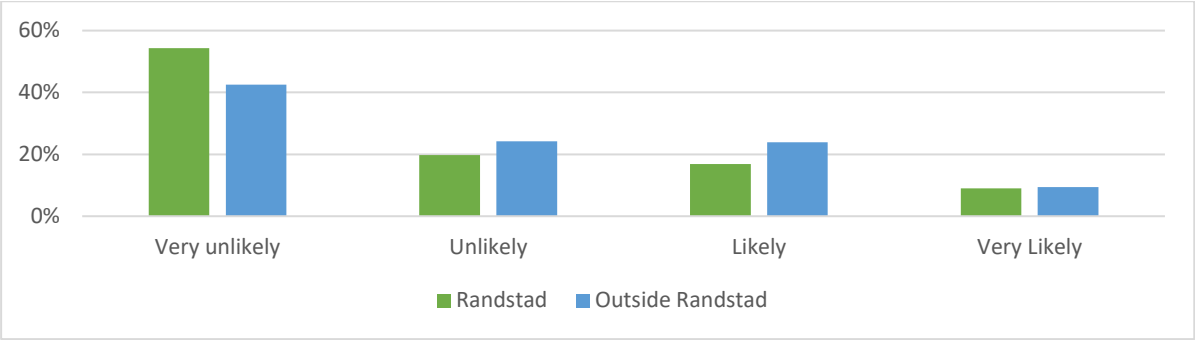


Figure 36. Randstad vs outside Randstad

There is a difference between the percentage of people inside and outside the Randstad. Above, Figure … shows a visualization of those differences. In general, people outside the Randstad are more willing to make use of PDS in PPG. People from outside the Randstad are less likely to make use of the services. The differences between those groups are: 'Very Unlikely' (12%), 'Unlikely' (4%), and 'Likely' (7%). Thereby, there is no difference between the groups regarding 'Very likely' to make use of the PDS in PPG. In both cases, the percentage is equal to 9. This is the same as is shown in the overall model.

The parameter estimations are presented below from the perspectives of two groups. The first column shows the names of the attributes, the second column presents the estimates of the Randstad and the third includes the significances of each estimate. The fourth column covers the estimates of the attributes for the respondents living outside the Randstad. Finally, the fifth column presents the estimation of this latter group.

Table 16. Parameter estimates of the Randstad

Parameter Estimates

Attributes	Levels	Randstad		Outside Randstad	
		Estimates	Sig.	Estimates	Sig.
package value	[prop. Value, € 450]	-,075	,597	-,270	,045
	[prop. Value, € 250]	-,233	,102	-,471	,001
	[prop. Value, € 50]	0[a]		0[a]	
package shelf life	[prop. Short, 1 day]	-,258	,071	-,466	,001
	[prop. Long, 7 days]	-,327	,023	-,267	,046
	[prop. Unlimited]	0[a]		0[a]	
package size	[prop. Big, freezer size]	-,797	,000	-,505	,000
	[prop. Average, transport box]	,069	,618	,030	,820
	[prop. Small, A3-format box]	0[a]		0[a]	
package weight	[prop. Weight, 15 kg]	,138	,329	-,084	,535
	[prop. Weight, 10 kg]	-,087	,548	-,027	,842
	[prop. Weight, 5 kg]	0[a]		0[a]	
travel time	[prop. 15 minutes]	-,281	,048	-,298	,029
	[prop. 10 minutes]	-,296	,038	-,366	,007
	[prop. 5 minutes]	0[a]		0[a]	
opening hours / service duration	[prop. 24 hours]	,453	,002	,826	,000
	[prop. 7:00-22:00 hours]	,504	,000	,790	,000
	[prop. 8:00-17:00 hours]	0[a]		0[a]	
free parking	[prop. First 15 minutes]	-,177	,211	,035	,799
	[prop. First 30 minutes]	,024	,866	,094	,487
	[prop. First 45 minutes]	0[a]		0[a]	
assistance	[prop. No assistant]	,024	,869	-,219	,111
	[prop. Personal assistant]	-,012	,932	,264	,051
	[prop. Virtual assistant]	0[a]		0[a]	

Link function: Logit.

a. This parameter is set to zero because it is redundant.

In yellow is highlighted the significant variables of characteristics

According to this analysis, there is a big difference between people inside and outside the Randstad. The largest difference can be seen for the significance of attributes. Value of a package is significant for people outside the Randstad. In contrast, for people living inside the Randstad, this attribute does not influence the willingness. Also, the shelf life of the package shows a difference for package shorter that one day of shelf life for people outside the Randstad. For people inside the Randstad, it is not significant. The biggest difference between this model and the overall model is that in this model the attribute Personal assistance becomes significant. The estimate of the assistance is positive and has a positive influence on customer's willingness to use PDS in PPG. Thereby, this estimation is comparable with the outcome of the previous subsection, where a comparison was made between high and low urban density areas. However, there are some differences in this model.

Respondents from the Randstad find the value of the package not significant. Where the respondents outside the Randstad find the value of the package very significant. Striking is that the value of €250 has a more negative effect on the likeliness with a value of €450, this is also found in the overall model.

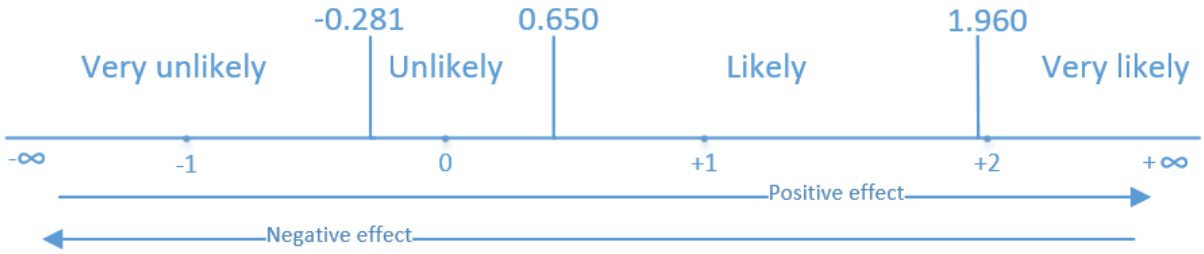


Figure 37. Prediction distribution of the Randstad residents

The distribution of thresholds for the respondents in the Randstad is divided unevenly. There is a higher chance of likely than unlikely. The distribution of unlikely is much lower than the distribution for likely.

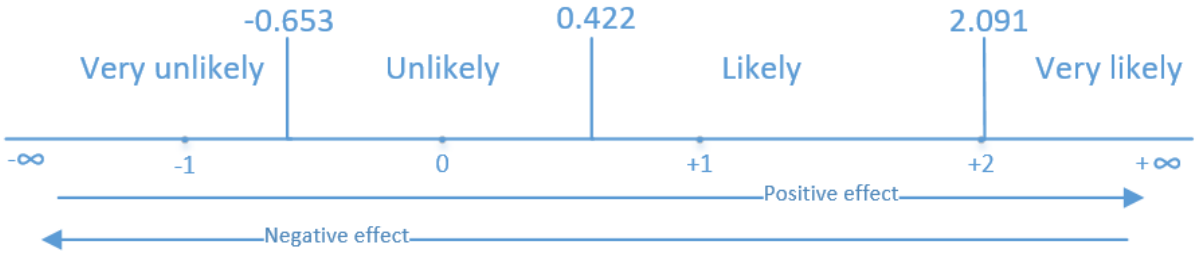


Figure 38. Prediction distribution of residents outside the Randstad

The distribution for residents outside the Randstad is more positive and are more inclined to choose for PDS in PPG. The unlikely aspect is in this case slightly bigger than residents living in the Randstad. The distribution between parameters is more evenly divided but tends to be more positive in the direction of likely.

The most critical thing that can be conclude is that people who live outside Randstad are more likely to make use of PDS in PPG than people who are living in the Randstad.

Distance to PPG

The next grouping characteristic concerns the distance that people live to a public parking garage. The groups are divided into people that live 5 minutes away to the nearest PPG and people that live more than 5 minutes away to the nearest PPG. This analysis is needed to investigate information noticed in the literature. According to literature people are more willing to go outside if the destination they need to go is not further than 5 minutes away. In this case, we have asked the respondents in the survey to assume the travel time by car from home to the nearest PPG. Here below the percentages are shown of the time that people need to travel from home to the closest PPG. That percentage is needed to see if there is a significant relation with respect to respondent's willingness of using PDS in PPG.

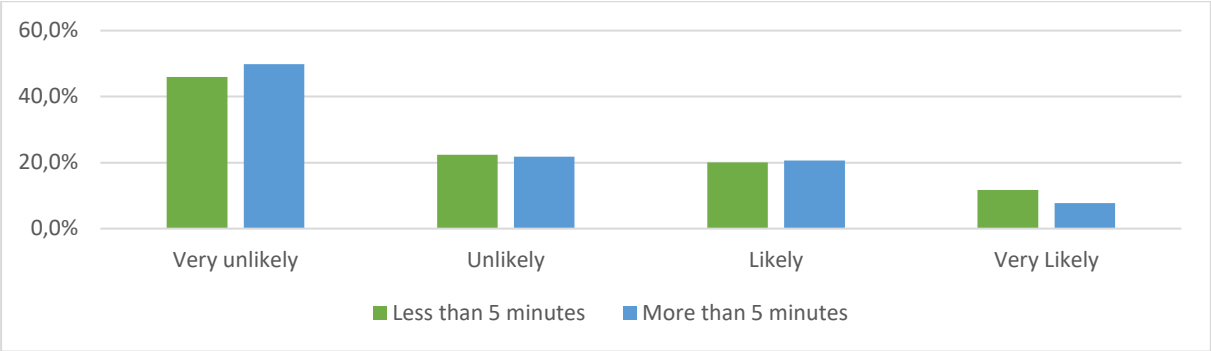


Figure 39. Distance to public parking garage

Compared to those percentages there is some small difference between people living closer than 5 minutes to PPG and more than 5 minutes to PPG. Almost 45% of respondents that live close to PPG are very unlikely to make use of PPG, and 12% are very likely to make use of PPG. In addition, for respondents who are living further than 5 minutes away those percentages are not that different. Those people are slightly more very unlikely to make use of PDS in PPG, almost 50%. Additionally, they are also less very likely to make use of, almost 8%.

This difference is minimal. Only 4% of people living close to PPG are very likely to make use of PDS in PPG. This difference was expected to be more than that. Therefore, it is possible to conclude that distance to a closer PPG does make a small influence attribute. As was expected, it is not that significant as it was expected according to literature study.

There is a big difference between parameter estimations per significant attribute level. For example, the package value for people that live next to the parking garage is only significant for €250. In contrast, for people living further away the value of €450 is also significant. The package shelf life is significant for packages to shorten than 1 day and longer than 7 days. However, for people living farther away, the significance of package shelf life shorter than one day is low. This might be due to the distance that people need to travel to get their package.

The package size of a freezer is for both groups almost the same and significant. Package weight is not significant for both groups. Travel time is very significant for people living further away than 5 minutes from PPG. This is a logical and understandable matter. The travel time of 10 and 15 minutes are both significant for this group. it is even more important for this group than for people living closer to PPG. People who live closer to PPG find the distance less important. Also, the distance of 10 minutes is significant, but the distance of 15 minutes is no longer significant for this group. Next significant attribute concerns the opening hours of PPG. This attribute is significant for both groups. However, the group living further away than 5 minutes find the opening hours double as important than the group that lives closer to PPG. The last two attributes of free parking and assistance are not significant in this case, as mentioned in Table 17.

Table 17. Distance to public parking garage

Parameter Estimates

Attributes	Levels	Less than 5 min. until PPG		More than 5 min. until PPG	
		Estimates	Sig.	Estimates	Sig.
package value	[prop. Value, € 450]	-,114	,376	-,248	,097
	[prop. Value, € 250]	-,343	,007	-,385	,012
	[prop. Value, € 50]	0[a]		0[a]	
package shelf life	[prop. Short, 1 day]	-,477	,000	-,196	,204
	[prop. Long, 7 days]	-,237	,060	-,360	,020
	[prop. Unlimited]	0[a]		0[a]	
package size	[prop. Big, freezer size]	-,717	,000	-,587	,000
	[prop. Average, transport box]	,150	,232	-,074	,621
	[prop. Small, A3-format box]	0[a]		0[a]	
package weight	[prop. Weight, 15 kg]	,005	,967	,026	,864
	[prop. Weight, 10 kg]	-,084	,515	-,039	,801
	[prop. Weight, 5 kg]	0[a]		0[a]	
travel time	[prop. 15 minutes]	-,202	,118	-,416	,006
	[prop. 10 minutes]	-,281	,028	-,408	,008
	[prop. 5 minutes]	0[a]		0[a]	
opening hours / service duration	[prop. 24 hours]	,486	,000	,853	,000
	[prop. 7:00-22:00 hours]	,548	,000	,766	,000
	[prop. 8:00-17:00 hours]	0[a]		0[a]	
free parking	[prop. First 15 minutes]	-,103	,420	-,004	,978
	[prop. First 30 minutes]	,110	,386	,028	,855
	[prop. First 45 minutes]	0[a]		0[a]	
assistance	[prop. No assistant]	-,018	,889	-,195	,206
	[prop. Personal assistant]	,109	,397	,144	,341
	[prop. Virtual assistant]	0[a]		0[a]	

Link function: Logit.

a. This parameter is set to zero because it is redundant.

In yellow is highlighted the significant variables of characteristics

The distribution of the prediction of the two groups is very alike. The distance of 5 minutes to PPG is more likely to make use of PDS in PPG. In Figure 40 And Figure 41 are those predictions are slightly aligned.

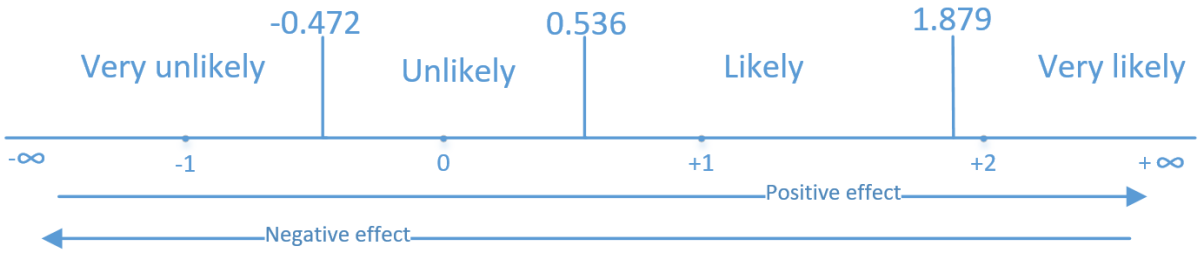


Figure 40. Prediction of distance to PPG up to 5 minutes distribution

The thresholds of unlikely and likely in Figure 40 are lower than in Figure 41 below. Other thresholds are higher. Therefore, it is possible to conclude that the willingness of people who live close to PPG is more equally distributed than of the people who live further than 5 minutes away from PPG. This difference is visualized in Figure 40 and Figure 41.

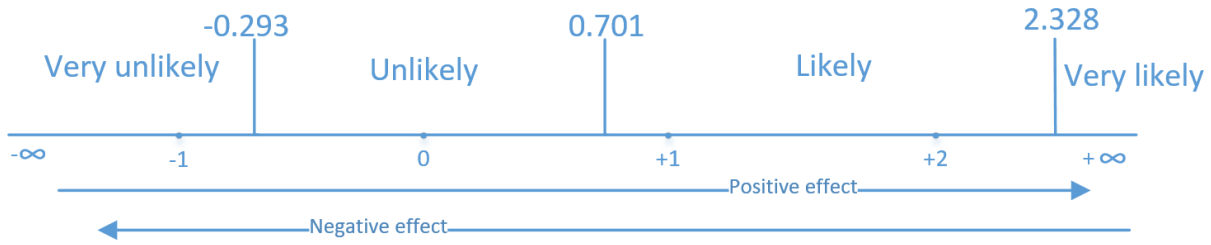


Figure 41. Prediction of distance to PPG more than 5 minutes distribution

Households

This section is about the household deviation of the respondents. During the survey, the respondents were asked to fill in wherever they are living along, with children, with parents, or with a partner. In this analysis, we made two groups of households. The first group is about the people that are living alone or living in a house with others, that contains household categories 1, 2, 5, and 6. The second group is about the people that are living together with a partner without children and with a partner and children that contains household categories 4 and 5.

The results of those household's groups are as follows. The people that are living as households 1, 2, 5, or 6 are in the first group. This group is estimated as a group that cannot count much on the help of a partner, as they live alone. The second group can count on the help of a partner that they are living with. If one partner is not at home, the other partner can receive a package. This is expected to have a significant difference in the people's choice behavior. Therefore, the following results are generated.

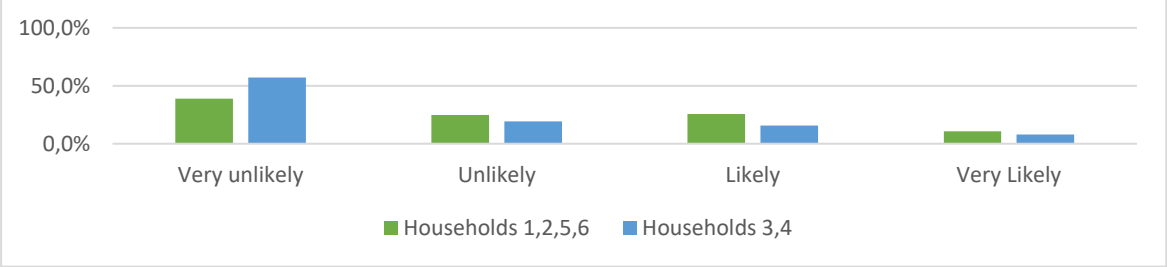


Figure 42. Households

The results are very different for the separated groups. The first group of people is much more willing to make use of PDS in PPD than the second group. The difference between those groups is very high. The second group that is not willing to make use of PDS in PPG, 77% of all people has chosen for (very) unlikely. That remains only 23% who are very likely to make use of this service. In the first group, about 64% of people are (very) unlikely to use the services while 36% of this group is (very) likely to do. The numbers in this group highly differ from each other. This might be due to that people living alone are more dependent on themselves and not on

a partner or a neighbor to receive a package. This was also addressed by some people when answering the survey.

According to attributes, there are some differences between the two groups. The first attribute is package value. For both groups this attribute is significant. However, for the first group the value of package matters in case of a value of €250 and €450. The value of a package is for the first group twice as important as for the second group. Also, the second group finds the value of €450 not significant. Additionally, the value, the size and the shelf life of the package is also for both groups significant and with the same effect of the attribute levels. There is not much difference between the three attributes for those groups. The package weight is not significant at all. The travel time to PPG is significant for both groups. However, there is also some difference in attribute levels for those groups. The second groups find the travel time of 10 and 15 minutes twice as important as group one. This attribute has a negative consequence of decision making. The first group finds the travel time of 15 minutes not significant. The opening hours of PPG are significant and have a high positive influence on decision making. The last two attributes (free parking and assistance) are not significant.

Table 18. Parameter estimates of households

Parameter Estimates

Attributes	Levels	Households 1,2,5,6		Households 3,4	
		Estimates	Sig.	Estimates	Sig.
package value	[prop. Value, € 450]	-,294	,033	-,056	,687
	[prop. Value, € 250]	-,496	,000	-,266	,063
	[prop. Value, € 50]	0[a]		0[a]	
package shelf life	[prop. Short, 1 day]	-,358	,010	-,364	,011
	[prop. Long, 7 days]	-,377	,005	-,270	,058
	[prop. Unlimited]	0[a]		0[a]	
package size	[prop. Big, freezer size]	-,542	,000	-,766	,000
	[prop. Average, transport box]	,018	,896	,118	,384
	[prop. Small, A3-format box]	0[a]		0[a]	
package weight	[prop. Weight, 15 kg]	-,012	,932	,043	,759
	[prop. Weight, 10 kg]	-,035	,798	-,107	,454
	[prop. Weight, 5 kg]	0[a]		0[a]	
travel time	[prop. 15 minutes]	-,063	,644	-,505	,000
	[prop. 10 minutes]	-,228	,097	-,414	,003
	[prop. 5 minutes]	0[a]		0[a]	
opening hours / service duration	[prop. 24 hours]	,704	,000	,624	,000
	[prop. 7:00-22:00 hours]	,783	,000	,496	,001
	[prop. 8:00-17:00 hours]	0[a]		0[a]	
free parking	[prop. First 15 minutes]	,057	,679	-,188	,184
	[prop. First 30 minutes]	,153	,264	-,023	,869
	[prop. First 45 minutes]	0[a]		0[a]	
assistance	[prop. No assistant]	-,161	,244	-,059	,682
	[prop. Personal assistant]	,202	,141	,062	,662
	[prop. Virtual assistant]	0[a]		0[a]	

Link function: Logit.

a. This parameter is set to zero because it is redundant.

In yellow is highlighted the significant variables of characteristics

The households 1, 2, 5 and 6 have a slightly evenly distribution. There is not much difference between the estimated thresholds. So, the likeliness of prediction for these groups is widely spread in the middle.

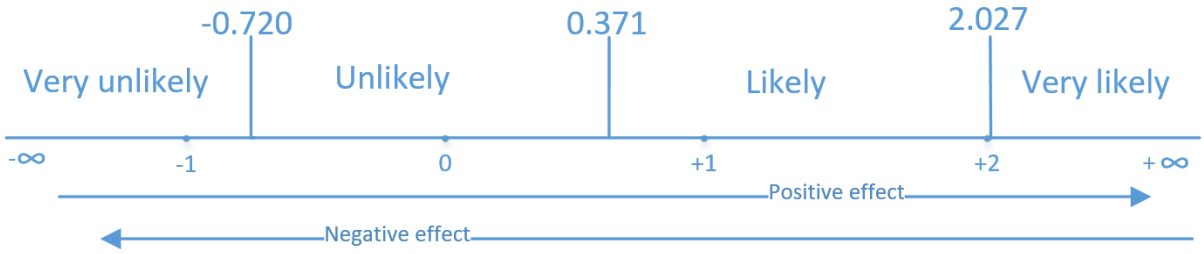


Figure 43. Prediction distribution of households 1, 2, 5 and 6

households 4 and 5 of the second group have a bigger difference between thresholds prediction distribution. The likelihood that the people are more willing to make use of PDS in PPG of this group is higher than in the first group. Therefore, the prediction is very positive indicating that this group is more willing to make use of this service.

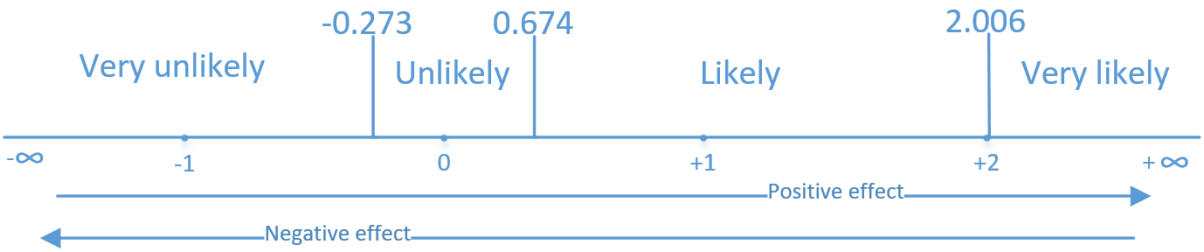


Figure 44. Prediction distribution of households 3 and 4

Gender

The fourth analysis made in the research is about the difference between males and females. There are almost as many female respondents as male respondents. According to the survey data, there are some small differences between gender likelihood of using PDS in PPG.

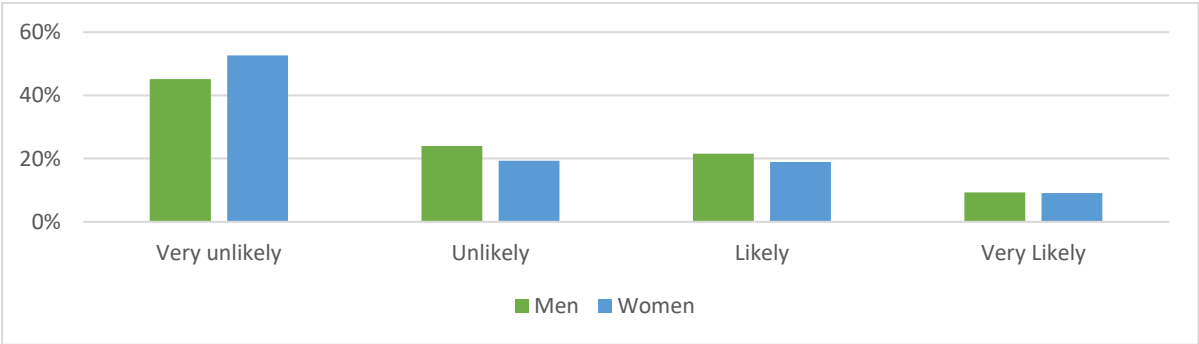


Figure 45. Gender likeliness difference

Men are more likely to make use of PDS in PPG than women. There is a slight difference regarding unlikely, 24% of men and 19% of women. The same is valid for likely, 22% of men and 19% of women chooses this answer option. Thereby, 53% of women choose very unlikely

in comparison to men with 45%. Women and men have the same percentage of 9, to choose very likely.

Women and men have more or less the same preference for attributes. However, there are some differences in level of estimations within some attributes. For example, packaging value is important for both genders. Within this attribute, women find each value of a package significant, wherever for men the value of €250 is significant but not the value of €450.

Additionally, the attribute package shelf life is significant for both men and women. The level of the short shelf life of 1 day and length of 7 days are both significant. However, for women, the short shelf life of 1 day is not significant. The size of big size packages for both genders is significant. The package weight is not significant at all.

Travel time attribute is significant for both genders. However, the level differs, for women the travel time is important at every level of 5, 10 and 15 minutes. For men only 10 minutes is significant. Therefore, it is possible to conclude that women are more sensitive for the travel time attribute than men. In this case, it is possible to conclude that women find attributes like travel time and opening hours of PPG twice as important as men. The effects of opening hours of a PPG are significant for both genders. Women also find the opening hours almost double as important as men. Also, there is a difference in time value for each gender. Women find the 24hour opening time more valuable than men, wherever for men this is another way around. Men find the opening hours from 7 am to 10 pm more valuable.

The last two attributes, free parking and assistance are for both genders not significant, as mentioned in Table 19 below.

Table 19. Parameter estimates of gender

Parameter Estimates

Attributes	Levels	Men		Women	
		Estimates	Sig.	Estimates	Sig.
package value	[prop. Value, € 450]	-,114	,376	-,248	,097
	[prop. Value, € 250]	-,343	,007	-,385	,012
	[prop. Value, € 50]	0[a]		0[a]	
package shelf life	[prop. Short, 1 day]	-,477	,000	-,196	,204
	[prop. Long, 7 days]	-,237	,060	-,360	,020
	[prop. Unlimited]	0[a]		0[a]	
package size	[prop. Big, freezer size]	-,717	,000	-,587	,000
	[prop. Average, transport box]	,150	,232	-,074	,621
	[prop. Small, A3-format box]	0[a]		0[a]	
package weight	[prop. Weight, 15 kg]	,005	,967	,026	,864
	[prop. Weight, 10 kg]	-,084	,515	-,039	,801
	[prop. Weight, 5 kg]	0[a]		0[a]	
travel time	[prop. 15 minutes]	-,202	,118	-,416	,006
	[prop. 10 minutes]	-,281	,028	-,408	,008
	[prop. 5 minutes]	0[a]		0[a]	
opening hours / service duration	[prop. 24 hours]	,486	,000	,853	,000
	[prop. 7:00-22:00 hours]	,548	,000	,766	,000
	[prop. 8:00-17:00 hours]	0[a]		0[a]	
free parking	[prop. First 15 minutes]	-,103	,420	-,004	,978
	[prop. First 30 minutes]	,110	,386	,028	,855
	[prop. First 45 minutes]	0[a]		0[a]	
assistance	[prop. No assistant]	-,018	,889	-,195	,206
	[prop. Personal assistant]	,109	,397	,144	,341
	[prop. Virtual assistant]	0[a]		0[a]	

Link function: Logit.

a. This parameter is set to zero because it is redundant.

In yellow is highlighted the significant variables of characteristics

The predicted distribution between genders is highly different. The distribution of likelihood for men is spread more evenly than for women. Based on the prediction threshold parameters, women are more likely to make use of PDS in PPG. The prediction of using PDS in PPG is distributed more in direction of likely.

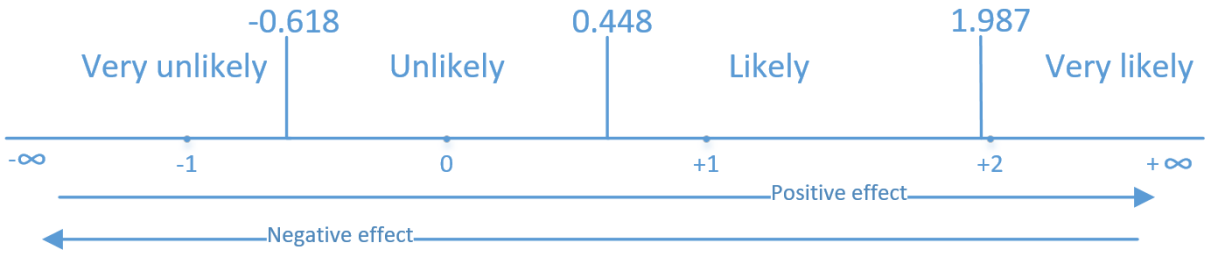


Figure 46. Prediction distribution of men

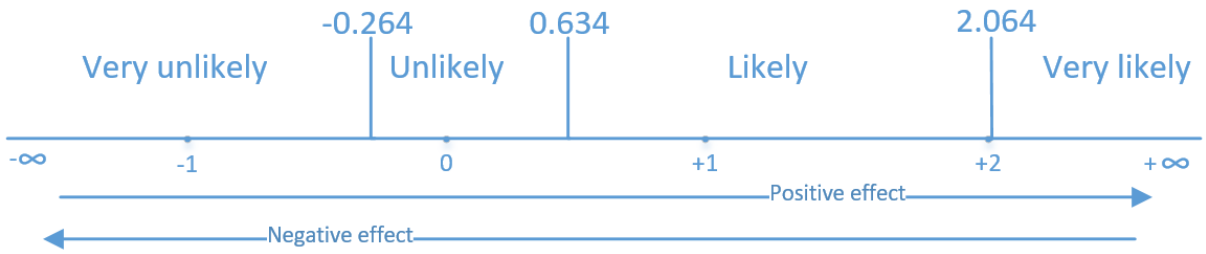


Figure 47. Prediction distribution of women

In conclusion, there are some differences between men and women. Those differences are not that large as was seen in previous groups. In comparison to the overall model, men distribution is more alike too. Women distribution is more in the direction of likability.

Age

The next analysis is about comparison between age groups. Due to respondents' number and their personal characteristics that were possible to collect, there is a difference made between two age groups. The respondents of the first group are all younger than 30 years. The second group consists of respondents that are 30 years and older.

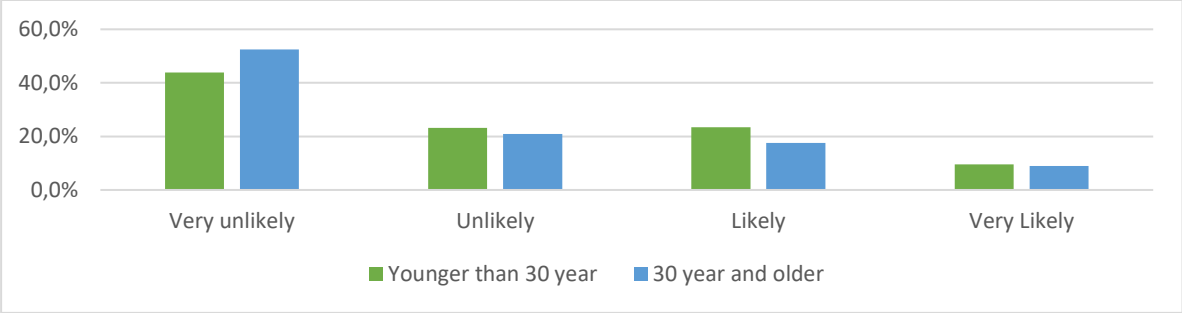


Figure 48. Age difference

Usually, younger people are more willing to try new things than older people. In this case, the prediction that younger people are more likely to try something different than older people is evaluated. Based on the percentages per age group it is possible to conclude that younger people are more willing to make use of PDS in PPG. Almost 44% of younger people are very unlikely to make use of PDS in PPG. Almost 52% of older people is very unlikely to make use of PDS in PPG. While 33% of younger people are (very) likely to make use of and for older people is that number more than 6% lower.

The significance of each attribute is more or less the same for both groups. The package value of €250 euro is significant for both groups. The effects of the package shelf life and package size are also significant. The package attribute package weight is not significant for both groups. Travel time to PPG is slightly different. Younger people prefer distance to PPG of 10 minutes, where older people find the distance of 10 and 15 minutes both significant. The last significant attribute concerns the opening hours of PPG. Both groups find all attribute levels significant. However, there is a difference in estimation per group. Younger people find the opening hours of PPG almost twice as important as older people. That might be due to fact

that younger people attach more value to have freedom of decision when they can pick up a package. The last two attributes are not significant for both groups.

Table 20. Parameter estimates of age

Parameter Estimates

Attributes	Levels	Younger than 30 years		30 years or older	
		Estimates	Sig.	Estimates	Sig.
package value	[prop. Value, € 450]	-,173	,212	-,174	,203
	[prop. Value, € 250]	-,396	,005	-,317	,020
	[prop. Value, € 50]	0[a]		0[a]	
package shelf life	[prop. Short, 1 day]	-,448	,002	-,296	,030
	[prop. Long, 7 days]	-,318	,022	-,300	,029
	[prop. Unlimited]	0[a]		0[a]	
package size	[prop. Big, freezer size]	-,785	,000	-,498	,000
	[prop. Average, transport box]	,010	,939	,127	,346
	[prop. Small, A3-format box]	0[a]		0[a]	
package weight	[prop. Weight, 15 kg]	-,121	,388	,124	,360
	[prop. Weight, 10 kg]	-,090	,523	-,042	,760
	[prop. Weight, 5 kg]	0[a]		0[a]	
travel time	[prop. 15 minutes]	-,204	,146	-,361	,009
	[prop. 10 minutes]	-,353	,011	-,295	,032
	[prop. 5 minutes]	0[a]		0[a]	
opening hours / service duration	[prop. 24 hours]	,781	,000	,505	,000
	[prop. 7:00-22:00 hours]	,804	,000	,469	,001
	[prop. 8:00-17:00 hours]	0[a]		0[a]	
free parking	[prop. First 15 minutes]	-,035	,803	-,118	,393
	[prop. First 30 minutes]	,069	,622	,065	,632
	[prop. First 45 minutes]	0[a]		0[a]	
assistance	[prop. No assistant]	,024	,867	-,191	,166
	[prop. Personal assistant]	,222	,116	,058	,671
	[prop. Virtual assistant]	0[a]		0[a]	

Link function: Logit.

a. This parameter is set to zero because it is redundant.

In yellow is highlighted the significant variables of characteristics

According to predicted distribution of age groups, the difference is not that large. The distribution for younger people is slightly shifted to the positive direction of likeliness. Therefore, we can conclude that people who are younger than 30 years are slightly more inclined to make use of PDS in PPG than people that are 30 years and older.

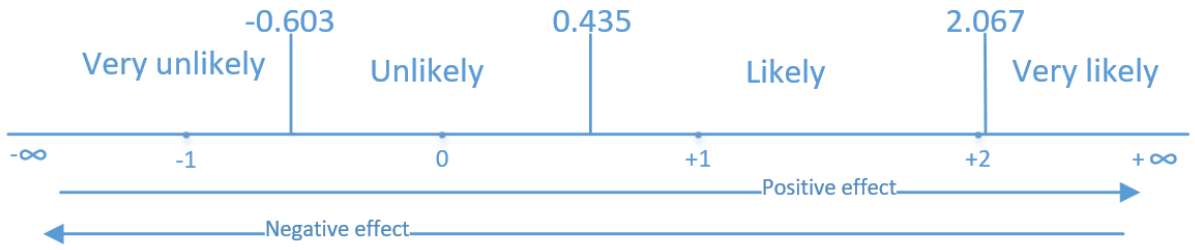


Figure 49. Prediction distribution of 29 years and lower

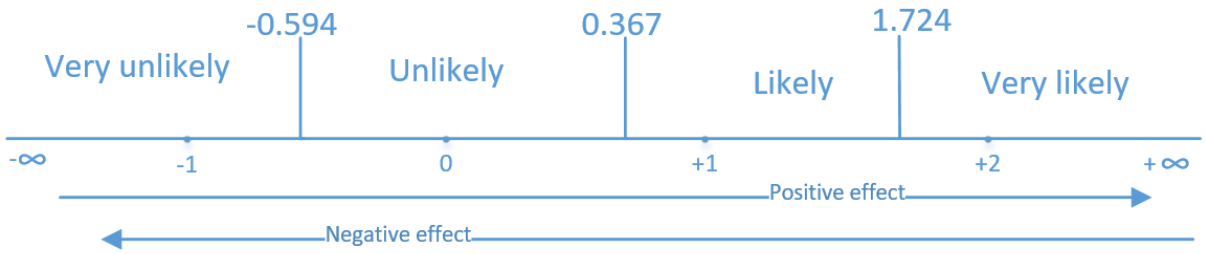


Figure 50. Prediction distribution of 30 years and older

Education

This section is about the comparison between people with a master's diploma or higher and people with a bachelor's diploma or lower. There was an interest to see the influence of education level on the willingness to make use of PDS in PPG.

Based on the percentages of willingness in those two groups, there was no difference found. 70% of both groups had chosen for (very) unlikely, and 30% had chosen for (very) likely. In this case, the willingness is the same in both groups. However, there are some differences in those groups in attribute significance and importance of those attribute levels.

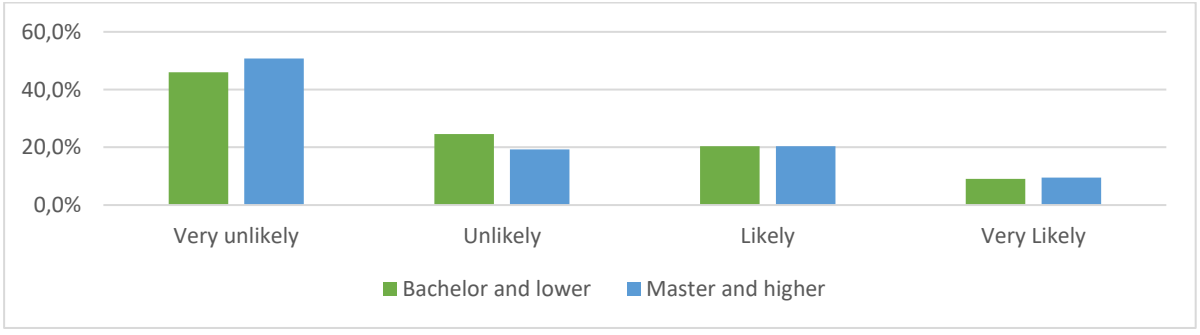


Figure 51. Level of education

Both groups have comparable results for attributes like value, shelf life and size of a package, as shown in Table 21 below. It is remarkable that people who have a bachelor or lower education find the package weight of 10 kilograms significant. The bachelors and lower education level group are the only group where these results are found. Apparently, this group finds the package weight also a significant attribute that has a negative effect on their willingness of using PDS in PPG. Additionally, this group finds the travel time to PPG also more

important and significant than master and higher educated group. The opening hours are significant for both groups as well, while the last two attributes are not.

Table 21. Parameter Estimates of education level

Parameter Estimates

Attributes	Levels	Bachelor and lower		Master and higher	
		Estimates	Sig.	Estimates	Sig.
package value	[prop. Value, € 450]	-,137	,305	-,203	,154
	[prop. Value, € 250]	-,396	,004	-,331	,019
	[prop. Value, € 50]	0[a]		0[a]	
package shelf life	[prop. Short, 1 day]	-,259	,055	-,512	,000
	[prop. Long, 7 days]	-,322	,019	-,309	,027
	[prop. Unlimited]	0[a]		0[a]	
package size	[prop. Big, freezer size]	-,513	,000	-,783	,000
	[prop. Average, transport box]	,152	,251	-,035	,804
	[prop. Small, A3-format box]	0[a]		0[a]	
package weight	[prop. Weight, 15 kg]	-,037	,783	,070	,624
	[prop. Weight, 10 kg]	-,237	,086	,097	,495
	[prop. Weight, 5 kg]	0[a]		0[a]	
travel time	[prop. 15 minutes]	-,391	,004	-,185	,193
	[prop. 10 minutes]	-,424	,002	-,239	,091
	[prop. 5 minutes]	0[a]		0[a]	
opening hours / service duration	[prop. 24 hours]	,553	,000	,732	,000
	[prop. 7:00-22:00 hours]	,651	,000	,641	,000
	[prop. 8:00-17:00 hours]	0[a]		0[a]	
free parking	[prop. First 15 minutes]	-,039	,776	-,141	,319
	[prop. First 30 minutes]	,072	,596	,035	,805
	[prop. First 45 minutes]	0[a]		0[a]	
assistance	[prop. No assistant]	-,074	,588	-,101	,484
	[prop. Personal assistant]	,086	,529	,189	,179
	[prop. Virtual assistant]	0[a]		0[a]	

Link function: Logit.

a. This parameter is set to zero because it is redundant.

In yellow is highlighted the significant variables of characteristics

The prediction distribution in both groups is various from each other. The prediction for bachelor and lower education group is more shifted to unlikely than to likely. There is a very high chance that people in this group find it likely to make use of PDS in PPG.

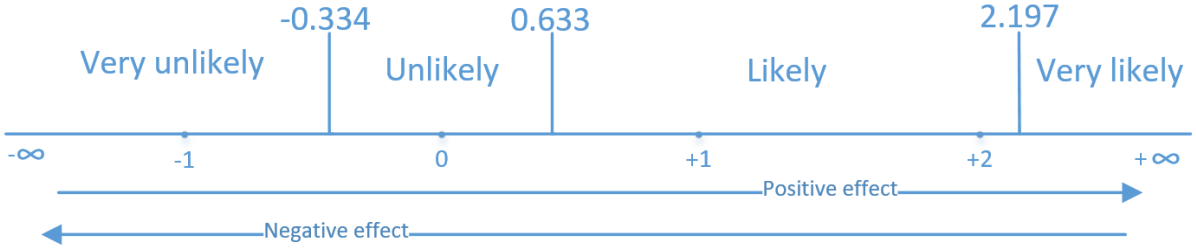


Figure 52. Prediction distribution of bachelor's degree and lower

The prediction for master and higher education group have a very high chance to choose likely and very likely for PDS in PPG. The distribution those two is very big. Therefore, it is possible to conclude that the group people with the education of master and higher are more willing to make use of PDS in PPG.

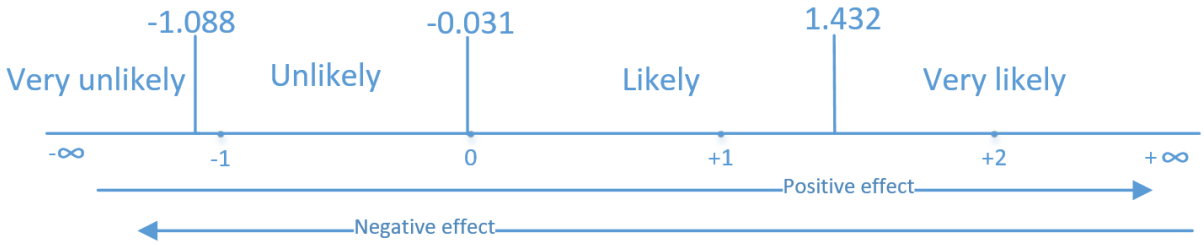


Figure 53. Prediction distribution of master's degree and higher

The percentages of chosen answers are for both groups the same. However, the prediction that group people with master and higher education will choose for PDS in PPG is much higher. Additionally, distribution prediction and likelihood percentages have not the same conclusion. So, there is a difference between those two groups, in the prediction of willingness.

3.9. OVERVIEW ESTIMATIONS

This section presents a summary of all the attributes per distinguished group. In the first column of Table 22, the attribute level is shown. In the appendix this table is easier to read. The second column includes the estimated values of the overall model and in the following column the estimates values of different groups are shown. In the orange colored rows, the significant estimate values are pointed out. In general, we can conclude that the overall model is a good reflection of the findings per group. The parameters estimated by the overall model are almost the same as in all groups. There are only a few exceptions. Some of the groups standing out. The group of bachelors or lower is the only group where the weight of 10 kg attribute level is significant. In addition, for people outside the Randstad and for people living in lower urbanization density, the personal assistance at PPG is significant. Overall, we can conclude that the likeliness of people to use PDS in PPG will limited under the following conditions:

- if the package value is high;
- if the package shelf life is shorter than 7 days;
- if the package is big;
- if the distance to closest PPG is longer than 10 minutes;

The likeliness of people to use PDS in PPG can be high when:

- the opening hours of PPG are wide, from 7 am to 10 pm;
- personal assistant in PPG is available.

Table 22. Overall table of attributes levels of all groups

Attribut levels	Overall model	Men	Women	Age up to 30 years	Age 30 year and above	Bachelor or lower	Mater of higher	House-holds 1,2,5,6	House-holds 3,4	Inside Randstad	Outside Randstad	High urbaniza-tion	Lower urbaniza-tion	Distance to PPG till 5 minutes	Distance to PPG more than 5 minutes
[KeuzeOptie_2 = 1]	-0,465	-0,618	-0,264	-0,603	-0,594	-0,494	-0,346	-0,720	-0,273	-0,281	-0,653	-0,334	-1,088	-0,472	-0,293
[KeuzeOptie_2 = 2]	0,523	0,448	0,634	0,435	0,367	0,616	0,534	0,371	0,674	0,650	0,422	0,633	-0,031	0,536	0,701
[KeuzeOptie_2 = 3]	2,011	1,987	2,067	2,067	1,724	2,123	2,014	2,027	2,006	1,960	2,091	2,196	1,432	1,879	2,328
[prop. Value, € 450]	-0,165	-0,114	-0,248	-0,173	-0,174	-0,137	-0,203	-0,294	-0,056	-0,0749	-0,270	-0,170	-0,136	-0,266	-0,105
[prop. Value, € 250]	-0,354	-0,343	-0,385	-0,396	-0,317	-0,396	-0,331	-0,496	-0,266	-0,233	-0,471	-0,330	-0,429	-0,459	-0,298
[prop. Value, € 50]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. Short, 1 day]	-0,374	-0,477	-0,196	-0,448	-0,296	-0,259	-0,512	-0,358	-0,364	-0,258	-0,466	-0,348	-0,436	-0,445	-0,359
[prop. Long, 7 days]	-0,310	-0,237	-0,360	-0,318	-0,300	-0,322	-0,309	-0,377	-0,270	-0,327	-0,267	-0,375	-0,271	-0,260	-0,376
[prop. Unlimited]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. Big, freezer size]	-0,648	-0,717	-0,587	-0,785	-0,498	-0,513	-0,783	-0,542	-0,766	-0,797	-0,505	-0,574	-0,798	-0,655	-0,671
[prop. Average, transport	0,065	0,150	-0,074	0,010	0,127	0,152	-0,035	0,018	0,118	0,069	0,030	-0,049	0,145	0,084	0,057
[prop. Small, A3-format	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. Weight, 15 kg]	0,015	0,005	0,026	-0,121	0,124	-0,037	0,070	-0,012	0,043	0,138	-0,084	0,188	-0,165	0,070	-0,037
[prop. Weight, 10 kg]	-0,051	-0,084	-0,039	-0,090	-0,042	-0,237	0,097	-0,035	-0,107	-0,087	-0,027	0,090	-0,174	-0,022	-0,098
[prop. Weight, 5 kg]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. 15 minutes]	-0,292	-0,202	-0,416	-0,204	-0,361	-0,391	-0,185	-0,063	-0,505	-0,281	-0,298	-0,096	-0,594	-0,074	-0,426
[prop. 10 minutes]	-0,332	-0,281	-0,408	-0,353	-0,295	-0,424	-0,239	-0,228	-0,414	-0,296	-0,366	-0,216	-0,550	-0,286	-0,377
[prop. 5 minutes]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. 24 hours]	0,642	0,486	0,853	0,781	0,505	0,553	0,732	0,704	0,624	0,453	0,826	0,590	0,700	0,899	0,482
[prop. 7:00-22:00 hours]	0,633	0,548	0,766	0,804	0,469	0,651	0,641	0,783	0,496	0,504	0,790	0,508	0,738	0,801	0,542
[prop. 8:00-17:00 hours]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. First 15 minutes]	-0,072	-0,103	-0,004	-0,035	-0,118	-0,039	-0,141	0,057	-0,188	-0,177	0,035	-0,085	-0,022	-0,080	-0,062
[prop. First 30 minutes]	0,074	0,110	0,028	0,069	0,065	0,072	0,035	0,153	-0,023	0,024	0,094	0,057	0,107	0,075	0,072
[prop. First 45 minutes]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. No assistant]	-0,085	-0,018	-0,195	0,024	-0,191	-0,074	-0,101	-0,161	-0,059	0,024	-0,219	-0,125	-0,026	-0,235	0,021
[prop. Personal aassistant]	0,128	0,109	0,144	0,222	0,058	0,086	0,189	0,202	0,062	-0,012	0,264	0,040	0,253	0,090	0,170
[prop. Virtual assistant]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a

4. Conclusion and discussion

This chapter includes conclusions and discussion based on the literature review and the survey analysis about Pubic Parking Garage (PPG) and Packaging Delivery Service (PDS). Additionally, this chapter holds some information about what was learned during the research, possible angles to explore in feature research, weaknesses and shortcomings of the study, strengths of the study, possible applications of the study (how it can be used), and finally the recommendations.

4.1. CONCLUSION

This research is based on the data of 250 respondents. Those respondents filled out an extensive online survey that included questions about experiences with online shopping, personal preference regarding delivery services and personal preferences regarding making use of PDS in PPG. The respondents are a good representation of the demographic present in the Netherlands. The biggest difference in this representation concerns the higher level of education and the higher percentage of young people in the age category between 18 and 29 years. These groups are more represented in the current sample compared to the total Dutch population. This can be explained due to the network of the researcher that was approached to recruit respondents.

The respondents' personal experiences of online shopping are based on the revealed online shopping behavior and delivery. Thereby some of the things stood out. For example, the type of article one buys and how often these articles are bought. Most of the customers buy clothes regularly (82%), and this article is also highly popular. Regarding frequency, customers order clothes online at least once a year. The online customers seem to have a diverse purchasing frequency with clothes, varying from only once a month to every week. The second most ordered online item concerns electronics. Those are usually ordered in sequence of a few times a week or a month. The least ordered online item concerns groceries. Most of the people never order groceries online. However, according to the literature, this is a growing trend that is suspected to grow in near future very rapidly.

In the next part of the survey, respondents were asked to fill in **the preferences** they have according to the current offered PDS and PPG service. Therefore, the answers were not that different from literature outcomes regarding regular delivery points. The first and most important aspect is the location with an average score of 82%. The second aspect concerns the travel time to the service point (70%). The third aspect was a bit more different from the literature study. It is opening hours (57%) of the PPG. This can be taken into consideration by decision-makers of PPG companies when designing a parking regime for their parking garages.

The last part is about **the 8 attributes** that were used in the survey**.** Each attribute was divided into 3 levels related to package and parking garages. To make the survey less complicated and more durable, the total number of attributes is decreased to 2x4; 4 attributes are related to parking garages and 4 related to packages that have to be delivered. There are 5 attributes out of 8 that are significant with a 90% confidence interval. Those are, from less to more

influential: package value, travel time, package shelf life, package size, and opening hours of PPG. The most influential attribute on the choice decision is the opening hours of a PPG. It is also the only significant positive attribute that is measured in this research. Customers prefer freedom in choosing whenever the individual suits the best. This might have to do with the working hours or study hours that many people need to consider. Therefore, it is beneficial to have a PDS in a parking garage with at least opening hours from 7 am untill 10 pm, and preferably a whole day long of 24 hours a day.

Notably, most of the included attributes of parking garages do not have a significant effect on the choice behavior of the customer if they may or may not choose a specific parking garage as a delivery point for their package. There is one attribute that is significant, and it is has a positive effect on people willingness to use PDS in PPG. The wider the opening hours of PPG the more likely people will make use PPG for PDS. Customers prefer the opening hours at least from 7 am until 10 pm, and even better to have PPG open the whole day, 24 hours.

Additionally, the driving time to a parking garage is important that it should be no longer than 5 minutes' drive by car otherwise it will have a negative effect on the customers. This behavior is already addressed in other literature studies and hereby it is confirmed. Travel time needs to be considered in PDS management decision making when the use of PDS in PPG is considered. However, it is not something a parking garage can do something about to change it.

Additionally, having **personal assistance in a parking garage** is not considered as significant in the context of this study because we have used it as a certainty of 90%, but it is possible to say that some people do appreciate personal assistance with a confidence of 85% and low positive estimation of 0.128. However, by dividing respondents into two groups, the group outside the Randstad and the group that is living in the less urban area are more willing to make use of this extra service. This could be spoken with 90% confidence.

The **size of the package** was significant, but the weight was not. That may have been so due to that in this research the extremes were taken for the size but not for the weight of a package.

When the attributes are significant, it means that they can be used in a simulation or survey because they could influence the willingness to use PPG for PDS. Thus, when the attributes are insignificant they have most likely no influence on the customer willingness. When the model was constructed it was considered that money-related attributes might be very important. Therefore, the free parking attribute level was used. However, considering the model output we found out that this was not the case. The parameter for the money related attribute is insignificant. However, it is possible to conclude something about the level of importance of free parking time. Due to the output, the free parking time of 15 minutes is to less and 45 minutes seems to be too much. Likewise, the free parking time of 30 minutes could be very useful to attract more people to make use of PDS in PPG.

4.2. DISCUSSION

This research was done from the different perspectives on two subjects. The first perspective concerns the need for car-free cities. The second perspective is from public garages owners to use empty parking spaces more efficiently. Those two perspectives can be considered by taking the researched attributes in this paper. By using those attributes, it might be possible to stimulate people in order to use PPG as PDS.

The most leverage attribute in the investigated choice behavior concerns the opening hours of a PPG. The personal assistance in PPG does not seem to matter that much. However, research shows that people still want to have a personal assistant but only 81% significance. The levels of the free parking attribute seem to differ that it was expected. There is a difference in time, the possibility of free parking for 15 minutes seems is too short while 45 seems to be too long. The perfect middle point would be a 30 minutes free parking for all PDS customers. It does not have to be free parking for longer than 30 minutes, as people apparently have enough time to ride in and out the parking garage in therefor required time. As people are willing to do additional shopping and park their car in PPG, it will be only a positive addition.

This research includes many young professionals in comparison with the national average population of the Netherlands. This might have influenced the outcomes of this research. However, many young professionals live in big cities, especially in a university city like Eindhoven. As this research is based on a solution for popular cities with many young professionals, the used dataset could still representative to this research.

This research could be a better representative of the Dutch population if there were more resources to data collection of more respondents across the whole country. Additionally, it could be better to include more respondents who make frequent use of online shopping. So, it will give more insight in the people who might have interest in this approach/solution for the problems most customers and package delivery companies are experiencing, like not delivered on time or missing your delivery and the time wasted time of need to be home and wait until package will arrive. This can be compared with people who never order something online, make use of a car and/or live in a rural area. The things that might be done better next time are the change of some attributes and attribute levels.

The changes that could be done are: measuring if people are still like to make use of parking garages if there was no free parking. As in this research, respondents were able to choose from free parking over 15 to 45 minutes. Instead of that, it could be better to use zero minutes of free parking, 15 minutes and 30 minutes.

Next change that is recommended is to have wide respondent's data. So, there will be more possibilities to create differs type of group in the same data set. This will improve the preference of respondents and give better overall prediction. It would be nice, if there will be a budget to visualize this problem and possibilities more detailed for the respondents. Maybe having a better explanation of the benefits that people may have by using PDS in PPG. This might create better understanding of the problem and possible solution that many people are

missing at the moment. Additionally, it is also possible to ask people in a survey if they would like to pay less for delivery at PPG while paying more for delivery at home (as suggested by some delivery companies). This might give a clear value to package delivery somewhere else rather than home.

Last important part is a car usage of respondents. Next time it is better to ask respondents whether they have a car or not. This could also make a difference between people who own cars and therefore want to use parking garage faster than people who do not have a car. Many respondents have a tunnel view about the parking garage usage. That a car is needed to enter a parking garage, forgetting that you might also be able to pick up a package by bike or by feet. So, fewer cars are entering the city, and more visitors are using parking garages for various reasons.

Additionally, the average respondent found it difficult to make a choice between the provided sets and to make a choice if they would like to make use of the presented facility in certain circumstances as was explained per case or not. Therefore, it is better to lower the total number of attributes to sex instead of eight. This makes a choice task simpler for the respondents. Likewise, if the model has only six attributes where a respondent need to make a choice, it might be beneficial to make a different type of survey. Therefore, the best options can be selected from the significant attributes founded in this thesis research. This is due to the level of difficulty. The next possible optimization of this research is to have more respondents. More respondents will increase data sets and making the model more useful.

4.3. SCIENTIFIC RELEVANCE

The scientific relevance of this research is to give some relevant attributes that are significant in making a choice of using PPG for PDS. Thereby to indicate the personal characteristics of the online shopping customers in this decision-making progress. Based on this research, it appears that there are 5 significant attributes. Those three out of five are package related attributes such as: value of a package, shelf life of a package and size of a package. The other two are parking garage related attributes, such as: travel time to the closest PPG and opening hours of PPG. Those attributes are important for further PPG and PDS based research.

4.4. SOCIAL RELEVANCE

The packaging delivery agencies can make use of the results of this research since packages are the focus of this research and which attributes influence the choice behavior of customers. According to this research, the package attributes are the ones that have significant negative values on the probability of PDS use in PPG. Additionally, municipalities can also use this report to see that there are some attributes that are also important for their zoning plans. For example, the influence of travel time that people are considering in their choice behavior is very high. Municipalities could influence this over some time by optimizing routes towards parking garages. The PPG owners and operators can use this research as well, to optimize their parking facilities.

4.5. RECOMMENDATIONS

Not all the possible attributes might have an influence on the decision making. This is due to the level of competition. The possible optimization of this research could be to have more respondents, increasing data sets, and making the model more complicated, where participants need to choose from more attributes.

This research is executed in the Netherlands with Dutch inhabitants. This makes it most relevant for the Dutch background assuming the Dutch culture and habits. It will be nice to do the same study in Europe or even worldwide to see if there are differences in the preferred attributes and if these preferences make the difference in the presented alternatives.

The limitations of the model are that many people see the parking garage as a place to park and not as an option for other use like a PDS point. This is because of reasons like unsafety or scarceness that there will be something happened to the package. This may influence the outcome of the current experiment. However, known from previous examples that people say that they do not need something that may be handy in the future, as smartphones, and when they see the advantages and other possibilities of a packaging delivery at parking garage they will be more willing to use it and see a parking garages more than a just a building to park cars.

It is also understandable, that many countries have no clear regulations on return processing leaving the customer or the retailer/ manufacturer legally exposed. Logistics providers today extend beyond basic warehousing services to provide an onsite or in-warehouse evaluation of returns and advice the retailer or manufacturer about the best course of action (Kraemer D., 2015)

Parking garages are easy to reach by car or another vehicle to deliver or pick up packages as infrastructure and needed roads to the parking garage already exist. These are important elements that make a parking garage attractive to people to use it as a PDS. Moreover, good location, short travel time, and extended opening hours of parking garage could increase the usability of PDS in PPG. About 30% of the customers would like to consider making use of PDS in PPG. This seems a low number, but this number is 3 times higher than the current use of the PDS at currently existing packaging delivery point. In the Netherlands, 80% of all packages delivery is ordered in combination with home delivery and 90% of the customers would like to have packages to be delivered at home. This number gives an opportunity and space to have more packages delivered at PDS points and part of it could be easily addressed at a local PPG. Therefore, PPG owners and decision makers do need to do more research on the technical and practical aspects of PPG. To make sure that not only customer perspective is addressed but also the practical once. The packaging delivery companies and decision makers need to come to compromise and new ideas to solve delivery problems. This is not only by finalizing home delivery but specially by improving and facilitating PDS in long run.

Moreover, to make this approach work, there should be a corporation between PPG decision makers and PDS decisionmakers. The both parties need to work together and agree on the possibilities and shortcomings that there might be. This approach addresses participation of two very different fields to work together to achieve their goals. Therefore, tight collaboration

and understanding is needed from two sides. Because from the customer point of view, this solution creates room for more delivery possibilities and another convenient option that a customer can choose from.

Additionally, there may be an opportunity for a next study but more from the perspective of shops. The shops are getting smaller due to better logistics possibilities and store costs. A square meter in the busy shopping streets increases in price, and to minimalize the costs, shops decrease the store surface. There might be also a chance for parking garages to serve as temporary storage. Shops around may even save some more money by doing it. For this idea, there need to be made a costs calculation if that model is costs reducing and beneficiate in terms of time-costs optimization.

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Appendixes

THE SURVEY EXAMPLE

Hoe vaak doet u online aankopen van hardware, elektronische en/of huishoudelijke apparaten?

- ○ Nooit
- ○ Eens per jaar
- ◉ Eens per maand
- ○ Eens per week

Waar laat u dit product meestal bezorgen?

- ○ Thuis
- ○ Buren
- ○ Afhaalpunt, bemand
- ◉ Afhaalpunt, onbemand

Met welk vervoermiddel haalt u dit soort pakketjes meestal op?

- ○ Fiets
- ○ Elektrische fiets
- ◉ Auto
- ○ Lopen
- ○ Anders, namelijk:

Hoe lang doet u er ongeveer over van uw huis tot het bezorgpunt te komen?

- ○ 15 min of minder
- ○ 16 - 30 min
- ◉ 31 - 60 min
- ○ Meer dan 60 min

Wanneer haalt u dit type pakketje meestal op?

- ◉ Op doordeweekse dagen
- ○ In het weekend

Vorige | Volgende

Technische Universiteit Eindhoven University of Technology

Pakketjes Parkeren

Anonieme persoonskenmerken

Page: Pagina3
Persoonsgegevens

Dit is de laatste onderdeel van deze enquete.

Wat is uw geslacht?

- ○ Man
- ◉ Vrouw

Wat is uw leeftijd?

- ○ < 17 jaar
- ○ 18 - 29 jaar
- ◉ 30 - 49 jaar
- ○ 50 - 65 jaar
- ○ > 65 jaar

Welke van de onderstaande woonsituatie is het meest op u van toepassing?

- ○ Alleenstaand zonder (inwonende) kinderen
- ◉ Alleenstaand met inwonend(e) kind(eren)
- ○ Samenwonend/getrouwd zonder (inwonende) kinderen
- ○ Samenwonend/getrouwd met inwonend(e) kind(eren)
- ○ Thuiswonend bij (groot)ouder(s)/familie
- ○ Wonend met anderen (geen familie)
- ○ Anders, namelijk:

Wat is uw hoogst genoten opleiding?

- ◉ Basisschool / Lagere school
- ○ Voortgezet onderwijs
- ○ Middelbare beroepsonderwijs (MBO)
- ○ Hoger beroepsonderwijs (HBO)
- ○ Wetenschappelijk onderwijs (WO)
- ○ Anders, namelijk:

Ben u in bezit van een rijbewijs?

- ○ Ja
- ◉ Nee

Wat zijn de 4 cijfers van uw postcode?

2343

Hoe ver woont u van de dichtstbijzijnde winkel, met een auto?

- ○ Ongeveer 5 minuten
- ○ Ongeveer 10 minuten
- ◉ Ongeveer 15 minuten
- ○ Ongeveer 20 minuten
- ○ Meer dan 20 minuten

Hoe ver is de dichtstbijzijnde parkeergarage van uw huis, met een auto?

- ○ Ongeveer 5 minuten
- ○ Ongeveer 10 minuten
- ○ Ongeveer 15 minuten
- ◉ Ongeveer 20 minuten
- ○ Meer dan 20 minuten

Vorige | Volgende

RECODING OF DATA EXAMPLES

RECpostcode

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 (1000-3999)	114	45.6	45.6	45.6
	2.00 (4000-6999)	126	50.4	50.4	96.0
	3.00 (7000-9999)	10	4.0	4.0	100.0
	Total	250	100.0	100.0	

RECIopen.rijdentotwinkel

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 - 5 min	223	89.2	89.2	89.2
	2.00 > 5 min	27	10.8	10.8	100.0
	Total	250	100.0	100.0	

RECIopen.rijdentotparkeergarage

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00 – 5 min	96	38.4	38.4	38.4
	2.00 > 5 min	154	61.6	61.6	100.0
	Total	250	100.0	100.0	

Tijd3 – packages delivery midweek / weekend

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	False	181	72.4	72.4	72.4
	True	69	27.6	27.6	100.0
	Total	250	100.0	100.0	

OVERALL MODEL OUTPUT IN SPSS

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.465	.162	8.243	1	.004	-.782	-.148
	[KeuzeOptie_2 = 2]	.523	.162	10.411	1	.001	.205	.840
	[KeuzeOptie_2 = 3]	2.011	.170	139.590	1	.000	1.677	2.344
Location	[prop.Waarde= 250 euro]	-.165	.097	2.903	1	.088	-.355	.025
	[prop.Waarde= 450 euro]	-.354	.098	13.152	1	.000	-.546	-.163
	[prop.Waarde= 50 euro]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.374	.098	14.545	1	.000	-.566	-.182
	[prop.Levensduur=Lang, 7 dagen]	-.310	.097	10.199	1	.001	-.501	-.120
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.065	.095	.462	1	.497	-.122	.252
	[prop.Grootte=Groot, Koelkastdoos]	-.648	.099	42.591	1	.000	-.843	-.454
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	.015	.097	.023	1	.880	-.175	.205
	[prop.Gewicht=15 kg]	-.051	.098	.272	1	.602	-.244	.141
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.292	.098	8.964	1	.003	-.483	-.101
	[prop.Reistijd=15 minuten]	-.332	.097	11.630	1	.001	-.523	-.141
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.642	.099	41.861	1	.000	.447	.836
	[prop.Openigstijden=7:00-22:00 uur]	.633	.099	40.781	1	.000	.439	.828
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.072	.098	.539	1	.463	-.263	.120
	[prop.Betaling=30 minuten]	.074	.097	.573	1	.449	-.117	.264
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.085	.098	.754	1	.385	-.278	.107
	[prop.Assistentie=Persoonlijke]	.128	.098	1.715	1	.190	-.063	.319
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Case Processing Summary

		N	Marginal Percentage
KeuzeOptie_2	Zeer onwaarschijnlijk	1088	48.4%
	Onwaarschijnlijk	495	22.0%
	Waarschijnlijk	459	20.4%
	Zeer waarschijnlijk	208	9.2%
prop.Waarde	â,¬ 250	751	33.4%
	â,¬ 450	749	33.3%
	â,¬ 50	750	33.3%
prop.Levensduur	Kort, 1 dag	749	33.3%
	Lang, 7 dagen	752	33.4%
	Onbeperkt	749	33.3%
prop.Grootte	Gemiddeld, Verhuisdoos	747	33.2%
	Groot, Koelkastdoos	754	33.5%
	Klein, A3-doos	749	33.3%
prop.Gewicht	10 kg	751	33.4%
	15 kg	750	33.3%
	5 kg	749	33.3%
prop.Reistijd	10 minuten	751	33.4%
	15 minuten	749	33.3%
	5 minuten	750	33.3%
prop.Openigstijden	24 uur	751	33.4%
	7:00-22:00 uur	748	33.2%
	8:00-17:00 uur	751	33.4%
prop.Betaling	15 minuten	750	33.3%
	30 minuten	750	33.3%
	45 minuten	750	33.3%
prop.Assistentie	Geen	751	33.4%
	Persoonlijke	750	33.3%
	Virtuele	749	33.3%
Valid		2250	100.0%
Missing		0	
Total		2250	

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	598.867			
Final	431.005	167.863	16	.000

Link function: Logit.

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	99.205	62	.002
Deviance	102.427	62	.001

Link function: Logit.

Pseudo R-Square

Cox and Snell	.072
Nagelkerke	.079
McFadden	.030

Link function: Logit.

RECopleiding

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	35	14.0	14.0	14.0
	2.00	93	37.2	37.2	51.2
	3.00	122	48.8	48.8	100.0
	Total	250	100.0	100.0	

RECLeeftijd

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	120	48.0	48.0	48.0
	2.00	69	27.6	27.6	75.6
	3.00	61	24.4	24.4	100.0
	Total	250	100.0	100.0	

MODELS FOR DIFFERENT GROUPS

Model for distance parking garages until 5 minutes

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.597	.223	7.150	1	.007	-1.034	-.159
	[KeuzeOptie_2 = 2]	.500	.223	5.025	1	.025	.063	.937
	[KeuzeOptie_2 = 3]	2.002	.235	72.608	1	.000	1.542	2.463
Location	[RECopleiding=1,00]	0[a]	.	.	0	.	.	.
	[prop.Waarde=â,¬ 250]	-.134	.133	1.008	1	.315	-.395	.127
	[prop.Waarde=â,¬ 450]	-.394	.136	8.341	1	.004	-.661	-.127
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.252	.135	3.520	1	.061	-.516	.011
	[prop.Levensduur=Lang, 7 dagen]	-.328	.136	5.804	1	.016	-.595	-.061
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.139	.132	1.115	1	.291	-.119	.398
	[prop.Grootte=Groot, Koelkastdoos]	-.521	.139	14.092	1	.000	-.793	-.249
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	-.026	.133	.038	1	.846	-.287	.236
	[prop.Gewicht=15 kg]	-.204	.137	2.217	1	.136	-.474	.065
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.399	.136	8.605	1	.003	-.666	-.132
	[prop.Reistijd=15 minuten]	-.432	.136	10.150	1	.001	-.698	-.166
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.549	.137	16.071	1	.000	.280	.817
	[prop.Openigstijden=7:00-22:00 uur]	.645	.138	22.022	1	.000	.376	.915
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.011	.136	.007	1	.933	-.279	.256
	[prop.Betaling=30 minuten]	.096	.136	.495	1	.482	-.171	.362
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.072	.135	.284	1	.594	-.338	.193
	[prop.Assistentie=Persoonlijke]	.085	.136	.387	1	.534	-.183	.352
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Model of parking garage distance of 5 minutes and more

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.482	.207	5.419	1	.020	-.889	-.076
	[KeuzeOptie_2 = 2]	.502	.207	5.861	1	.015	.096	.908
	[KeuzeOptie_2 = 3]	2.119	.221	92.330	1	.000	1.687	2.552
Location	[prop.Waarde=â,¬ 250]	-.101	.124	.669	1	.414	-.344	.141
	[prop.Waarde=â,¬ 450]	-.287	.126	5.223	1	.022	-.533	-.041
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.351	.125	7.832	1	.005	-.596	-.105
	[prop.Levensduur=Lang, 7 dagen]	-.359	.125	8.297	1	.004	-.603	-.115
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.059	.122	.233	1	.630	-.180	.297
	[prop.Grootte=Groot, Koelkastdoos]	-.667	.129	26.852	1	.000	-.919	-.415
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	-.036	.124	.085	1	.771	-.279	.207
	[prop.Gewicht=15 kg]	-.083	.125	.439	1	.508	-.327	.162
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.434	.126	11.776	1	.001	-.682	-.186
	[prop.Reistijd=15 minuten]	-.368	.125	8.711	1	.003	-.613	-.124
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.478	.128	14.020	1	.000	.228	.728
	[prop.Openigstijden=7:00-22:00 uur]	.542	.127	18.305	1	.000	.293	.790
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.064	.126	.259	1	.611	-.310	.182
	[prop.Betaling=30 minuten]	.082	.125	.426	1	.514	-.164	.327
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	.017	.127	.018	1	.894	-.231	.265
	[prop.Assistentie=Persoonlijke]	.163	.126	1.671	1	.196	-.084	.410
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[REClopen.rijdentotparkeergarage= 2,00]	0[a]	.	.	0	.	.	.

Model of men group

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.618	.211	8.562	1	.003	-1.033	-.204
	[KeuzeOptie_2 = 2]	.448	.211	4.511	1	.034	.035	.862
	[KeuzeOptie_2 = 3]	1.987	.222	79.864	1	.000	1.551	2.423
Location	[prop.Waarde=â,¬ 250]	-.114	.129	.785	1	.376	-.366	.138
	[prop.Waarde=â,¬ 450]	-.343	.127	7.241	1	.007	-.593	-.093
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.477	.128	13.787	1	.000	-.728	-.225
	[prop.Levensduur=Lang, 7 dagen]	-.237	.126	3.525	1	.060	-.485	.010
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.150	.125	1.430	1	.232	-.096	.396
	[prop.Grootte=Groot, Koelkastdoos]	-.717	.131	29.932	1	.000	-.974	-.460
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	.005	.127	.002	1	.967	-.243	.253
	[prop.Gewicht=15 kg]	-.084	.129	.424	1	.515	-.336	.168
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.202	.129	2.443	1	.118	-.456	.051
	[prop.Reistijd=15 minuten]	-.281	.128	4.845	1	.028	-.531	-.031
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.486	.129	14.259	1	.000	.234	.739
	[prop.Openigstijden=7:00-22:00 uur]	.548	.130	17.854	1	.000	.294	.802
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.103	.128	.649	1	.420	-.355	.148
	[prop.Betaling=30 minuten]	.110	.127	.751	1	.386	-.139	.358
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.018	.129	.020	1	.889	-.272	.235
	[prop.Assistentie=Persoonlijke]	.109	.129	.718	1	.397	-.143	.362
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[Geslacht=1]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Model of women group

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.618	.211	8.562	1	.003	-1.033	-.204
	[KeuzeOptie_2 = 2]	.448	.211	4.511	1	.034	.035	.862
	[KeuzeOptie_2 = 3]	1.987	.222	79.864	1	.000	1.551	2.423
Location	[prop.Waarde=â,¬ 250]	-.114	.129	.785	1	.376	-.366	.138
	[prop.Waarde=â,¬ 450]	-.343	.127	7.241	1	.007	-.593	-.093
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.477	.128	13.787	1	.000	-.728	-.225
	[prop.Levensduur=Lang, 7 dagen]	-.237	.126	3.525	1	.060	-.485	.010
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.150	.125	1.430	1	.232	-.096	.396
	[prop.Grootte=Groot, Koelkastdoos]	-.717	.131	29.932	1	.000	-.974	-.460
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	.005	.127	.002	1	.967	-.243	.253
	[prop.Gewicht=15 kg]	-.084	.129	.424	1	.515	-.336	.168
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.202	.129	2.443	1	.118	-.456	.051
	[prop.Reistijd=15 minuten]	-.281	.128	4.845	1	.028	-.531	-.031
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.486	.129	14.259	1	.000	.234	.739
	[prop.Openigstijden=7:00-22:00 uur]	.548	.130	17.854	1	.000	.294	.802
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.103	.128	.649	1	.420	-.355	.148
	[prop.Betaling=30 minuten]	.110	.127	.751	1	.386	-.139	.358
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.018	.129	.020	1	.889	-.272	.235
	[prop.Assistentie=Persoonlijke]	.109	.129	.718	1	.397	-.143	.362
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[Geslacht=1]	0[a]	.	.	0	.	.	.

Link function: Logit.

Model of low urban density

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.592	.205	8.311	1	.004	-.994	-.189
	[KeuzeOptie_2 = 2]	.417	.205	4.150	1	.042	.016	.819
	[KeuzeOptie_2 = 3]	1.909	.214	79.628	1	.000	1.490	2.329
Location	[prop.Waarde=â,¬ 250]	-.150	.115	1.708	1	.191	-.375	.075
	[prop.Waarde=â,¬ 450]	-.340	.116	8.547	1	.003	-.567	-.112
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.405	.116	12.147	1	.000	-.633	-.177
	[prop.Levensduur=Lang, 7 dagen]	-.375	.116	10.518	1	.001	-.602	-.148
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.021	.114	.035	1	.851	-.201	.244
	[prop.Grootte=Groot, Koelkastdoos]	-.639	.117	29.909	1	.000	-.868	-.410
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	.056	.115	.236	1	.627	-.169	.281
	[prop.Gewicht=15 kg]	.035	.116	.093	1	.761	-.192	.263
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.220	.115	3.630	1	.057	-.446	.006
	[prop.Reistijd=15 minuten]	-.316	.115	7.588	1	.006	-.542	-.091
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.589	.118	24.983	1	.000	.358	.821
	[prop.Openigstijden=7:00-22:00 uur]	.559	.118	22.517	1	.000	.328	.789
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.108	.117	.859	1	.354	-.336	.120
	[prop.Betaling=30 minuten]	.094	.115	.679	1	.410	-.130	.319
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.097	.116	.689	1	.406	-.325	.131
	[prop.Assistentie=Persoonlijke]	.124	.115	1.146	1	.284	-.103	.350
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[MateVanStedelijkheid_105=1]	-.158	.104	2.342	1	.126	-.361	.044
	[MateVanStedelijkheid_105=2]	0[a]	.	.	0	.	.	.

Model of high urban density

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-1.003	.335	8.974	1	.003	-1.659	-.347
	[KeuzeOptie_2 = 2]	.005	.332	.000	1	.988	-.646	.656
	[KeuzeOptie_2 = 3]	1.565	.343	20.799	1	.000	.893	2.238
Location	[prop.Waarde=â,¬ 250]	-.117	.189	.383	1	.536	-.487	.253
	[prop.Waarde=â,¬ 450]	-.426	.187	5.156	1	.023	-.793	-.058
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.366	.191	3.648	1	.056	-.741	.010
	[prop.Levensduur=Lang, 7 dagen]	-.211	.189	1.247	1	.264	-.580	.159
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.134	.183	.539	1	.463	-.224	.493
	[prop.Grootte=Groot, Koelkastdoos]	-.771	.197	15.346	1	.000	-1.157	-.385
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	-.084	.187	.202	1	.653	-.451	.283
	[prop.Gewicht=15 kg]	-.288	.191	2.262	1	.133	-.662	.087
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.665	.192	11.996	1	.001	-1.042	-.289
	[prop.Reistijd=15 minuten]	-.556	.192	8.392	1	.004	-.932	-.180
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.824	.189	18.949	1	.000	.453	1.195
	[prop.Openigstijden=7:00-22:00 uur]	.818	.193	18.045	1	.000	.441	1.196
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	.062	.186	.112	1	.738	-.302	.426
	[prop.Betaling=30 minuten]	.043	.191	.050	1	.824	-.332	.418
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.001	.192	.000	1	.995	-.377	.374
	[prop.Assistentie=Persoonlijke]	.196	.190	1.062	1	.303	-.177	.569
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[MateVanStedelijkheid_105=3]	-.599	.173	11.924	1	.001	-.938	-.259
	[MateVanStedelijkheid_105=4]	-.289	.226	1.638	1	.201	-.732	.154
	[MateVanStedelijkheid_105=5]	0[a]	.	.	0	.	.	.

Model of people living along

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.720	.230	9.802	1	.002	-1.170	-.269
	[KeuzeOptie_2 = 2]	.371	.229	2.620	1	.106	-.078	.820
	[KeuzeOptie_2 = 3]	2.027	.240	71.339	1	.000	1.557	2.498
Location	[prop.Waarde=â,¬ 250]	-.294	.138	4.557	1	.033	-.564	-.024
	[prop.Waarde=â,¬ 450]	-.496	.137	13.069	1	.000	-.765	-.227
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.358	.138	6.704	1	.010	-.629	-.087
	[prop.Levensduur=Lang, 7 dagen]	-.377	.136	7.717	1	.005	-.643	-.111
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.018	.137	.017	1	.896	-.250	.285
	[prop.Grootte=Groot, Koelkastdoos]	-.542	.139	15.308	1	.000	-.814	-.271
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	-.012	.137	.007	1	.932	-.280	.257
	[prop.Gewicht=15 kg]	-.035	.138	.066	1	.798	-.306	.235
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.063	.137	.213	1	.644	-.333	.206
	[prop.Reistijd=15 minuten]	-.228	.137	2.758	1	.097	-.498	.041
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.704	.140	25.291	1	.000	.430	.979
	[prop.Openigstijden=7:00-22:00 uur]	.783	.139	31.699	1	.000	.510	1.055
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	.057	.138	.171	1	.679	-.213	.327
	[prop.Betaling=30 minuten]	.153	.137	1.250	1	.264	-.115	.421
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.161	.138	1.357	1	.244	-.432	.110
	[prop.Assistentie=Persoonlijke]	.202	.138	2.164	1	.141	-.067	.472
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[REChousehold=1,00]	0[a]	.	.	0	.	.	.

Model of people leaving together

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.273	.232	1.391	1	.238	-.728	.181
	[KeuzeOptie_2 = 2]	.674	.232	8.396	1	.004	.218	1.129
	[KeuzeOptie_2 = 3]	2.006	.245	67.123	1	.000	1.526	2.486
Location	[prop.Waarde=â,¬ 250]	-.056	.140	.162	1	.687	-.330	.217
	[prop.Waarde=â,¬ 450]	-.266	.143	3.469	1	.063	-.545	.014
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.364	.143	6.491	1	.011	-.644	-.084
	[prop.Levensduur=Lang, 7 dagen]	-.270	.142	3.585	1	.058	-.549	.009
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.118	.136	.757	1	.384	-.148	.384
	[prop.Grootte=Groot, Koelkastdoos]	-.766	.147	27.179	1	.000	-1.054	-.478
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	.043	.140	.094	1	.759	-.232	.318
	[prop.Gewicht=15 kg]	-.107	.143	.560	1	.454	-.388	.173
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.505	.143	12.502	1	.000	-.784	-.225
	[prop.Reistijd=15 minuten]	-.414	.141	8.653	1	.003	-.690	-.138
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.624	.144	18.891	1	.000	.343	.905
	[prop.Openigstijden=7:00-22:00 uur]	.496	.145	11.635	1	.001	.211	.781
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.188	.141	1.761	1	.184	-.465	.089
	[prop.Betaling=30 minuten]	-.023	.141	.027	1	.869	-.299	.253
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.059	.144	.168	1	.682	-.340	.223
	[prop.Assistentie=Persoonlijke]	.062	.142	.191	1	.662	-.217	.341
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[REChousehold=2,00]	0[a]	.	.	0	.	.	.

Model of age until 29 years

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.603	.239	6.386	1	.012	-1.071	-.135
	[KeuzeOptie_2 = 2]	.435	.238	3.334	1	.068	-.032	.903
	[KeuzeOptie_2 = 3]	2.067	.250	68.443	1	.000	1.578	2.557
Location	[prop.Waarde=â,¬ 250]	-.173	.139	1.558	1	.212	-.445	.099
	[prop.Waarde=â,¬ 450]	-.396	.141	7.934	1	.005	-.672	-.121
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.448	.143	9.881	1	.002	-.728	-.169
	[prop.Levensduur=Lang, 7 dagen]	-.318	.139	5.219	1	.022	-.590	-.045
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.010	.136	.006	1	.939	-.256	.277
	[prop.Grootte=Groot, Koelkastdoos]	-.785	.143	29.997	1	.000	-1.066	-.504
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	-.121	.140	.747	1	.388	-.395	.153
	[prop.Gewicht=15 kg]	-.090	.141	.407	1	.523	-.366	.186
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.204	.141	2.115	1	.146	-.480	.071
	[prop.Reistijd=15 minuten]	-.353	.139	6.482	1	.011	-.626	-.081
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.781	.144	29.506	1	.000	.499	1.063
	[prop.Openigstijden=7:00-22:00 uur]	.804	.143	31.660	1	.000	.524	1.084
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.035	.140	.062	1	.803	-.309	.239
	[prop.Betaling=30 minuten]	.069	.141	.243	1	.622	-.207	.346
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	.024	.142	.028	1	.867	-.254	.301
	[prop.Assistentie=Persoonlijke]	.222	.141	2.470	1	.116	-.055	.498
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[Leeftijd=1]	-.343	.466	.539	1	.463	-1.257	.572
	[Leeftijd=2]	0[a]	.	.	0	.	.	.

Link function: Logit.

a. This parameter is set to zero because it is redundant.

Model of 30 years and older

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.594	.323	3.398	1	.065	-1.227	.038
	[KeuzeOptie_2 = 2]	.367	.322	1.297	1	.255	-.265	.998
	[KeuzeOptie_2 = 3]	1.724	.330	27.365	1	.000	1.078	2.370
Location	[prop.Waarde=â,¬ 250]	-.174	.137	1.623	1	.203	-.443	.094
	[prop.Waarde=â,¬ 450]	-.317	.137	5.385	1	.020	-.585	-.049
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.296	.136	4.730	1	.030	-.563	-.029
	[prop.Levensduur=Lang, 7 dagen]	-.300	.137	4.774	1	.029	-.569	-.031
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.127	.135	.889	1	.346	-.138	.392
	[prop.Grootte=Groot, Koelkastdoos]	-.498	.139	12.800	1	.000	-.771	-.225
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	.124	.135	.840	1	.360	-.141	.390
	[prop.Gewicht=15 kg]	-.042	.138	.093	1	.760	-.313	.229
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.361	.137	6.920	1	.009	-.631	-.092
	[prop.Reistijd=15 minuten]	-.295	.138	4.583	1	.032	-.564	-.025
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.505	.138	13.385	1	.000	.234	.775
	[prop.Openigstijden=7:00-22:00 uur]	.469	.139	11.393	1	.001	.197	.741
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.118	.138	.730	1	.393	-.388	.153
	[prop.Betaling=30 minuten]	.065	.135	.229	1	.632	-.200	.330
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.191	.138	1.915	1	.166	-.461	.080
	[prop.Assistentie=Persoonlijke]	.058	.136	.181	1	.671	-.209	.325
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[Leeftijd=3]	-.181	.248	.535	1	.464	-.667	.304
	[Leeftijd=4]	-.366	.251	2.120	1	.145	-.859	.127
	[Leeftijd=5]	0[a]	.	.	0	.	.	.

Model of people living in the Randstad

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.281	.238	1.397	1	.237	-.748	.185
	[KeuzeOptie_2 = 2]	.650	.239	7.415	1	.006	.182	1.118
	[KeuzeOptie_2 = 3]	1.960	.250	61.376	1	.000	1.469	2.450
Location	[prop.Waarde=â,¬ 250]	-.075	.142	.279	1	.597	-.353	.203
	[prop.Waarde=â,¬ 450]	-.233	.143	2.672	1	.102	-.513	.046
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.258	.143	3.262	1	.071	-.538	.022
	[prop.Levensduur=Lang, 7 dagen]	-.327	.143	5.184	1	.023	-.608	-.045
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.069	.138	.248	1	.618	-.201	.338
	[prop.Grootte=Groot, Koelkastdoos]	-.797	.146	29.923	1	.000	-1.082	-.511
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	.138	.141	.952	1	.329	-.139	.415
	[prop.Gewicht=15 kg]	-.087	.144	.360	1	.548	-.370	.196
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.281	.142	3.905	1	.048	-.560	-.002
	[prop.Reistijd=15 minuten]	-.296	.143	4.299	1	.038	-.576	-.016
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.453	.147	9.515	1	.002	.165	.740
	[prop.Openigstijden=7:00-22:00 uur]	.504	.143	12.324	1	.000	.222	.785
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.177	.142	1.564	1	.211	-.455	.101
	[prop.Betaling=30 minuten]	.024	.142	.028	1	.866	-.255	.302
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	.024	.142	.027	1	.869	-.256	.303
	[prop.Assistentie=Persoonlijke]	-.012	.143	.007	1	.932	-.293	.268
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[RECpostcode=1,00]	0[a]	.	.	0	.	.	.

Model of people living outside the Randstad

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.653	.223	8.589	1	.003	-1.089	-.216
	[KeuzeOptie_2 = 2]	.422	.222	3.599	1	.058	-.014	.857
	[KeuzeOptie_2 = 3]	2.091	.234	79.902	1	.000	1.633	2.550
Location	[prop.Waarde=â,¬ 250]	-.270	.135	4.030	1	.045	-.534	-.006
	[prop.Waarde=â,¬ 450]	-.471	.136	12.024	1	.001	-.737	-.205
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.466	.136	11.683	1	.001	-.733	-.199
	[prop.Levensduur=Lang, 7 dagen]	-.267	.134	3.966	1	.046	-.530	-.004
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.030	.134	.052	1	.820	-.231	.292
	[prop.Grootte=Groot, Koelkastdoos]	-.505	.138	13.410	1	.000	-.775	-.235
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	-.084	.135	.386	1	.535	-.348	.180
	[prop.Gewicht=15 kg]	-.027	.136	.040	1	.842	-.293	.239
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.298	.136	4.791	1	.029	-.565	-.031
	[prop.Reistijd=15 minuten]	-.366	.135	7.323	1	.007	-.631	-.101
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.826	.136	36.752	1	.000	.559	1.093
	[prop.Openigstijden=7:00-22:00 uur]	.790	.139	32.242	1	.000	.518	1.063
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	.035	.137	.065	1	.799	-.233	.303
	[prop.Betaling=30 minuten]	.094	.135	.483	1	.487	-.170	.358
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.219	.137	2.537	1	.111	-.488	.050
	[prop.Assistentie=Persoonlijke]	.264	.135	3.815	1	.051	-.001	.529
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[RECpostcode=2,00]	0[a]	.	.	0	.	.	.

Model of people with bachelor's degree or lower

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.494	.226	4.783	1	.029	-.936	-.051
	[KeuzeOptie_2 = 2]	.616	.226	7.436	1	.006	.173	1.059
	[KeuzeOptie_2 = 3]	2.123	.239	79.227	1	.000	1.656	2.591
Location	[prop.Waarde=â,¬ 250]	-.137	.134	1.054	1	.305	-.399	.125
	[prop.Waarde=â,¬ 450]	-.396	.137	8.384	1	.004	-.664	-.128
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.259	.135	3.681	1	.055	-.524	.006
	[prop.Levensduur=Lang, 7 dagen]	-.322	.137	5.545	1	.019	-.589	-.054
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	.152	.132	1.319	1	.251	-.107	.411
	[prop.Grootte=Groot, Koelkastdoos]	-.513	.139	13.562	1	.000	-.786	-.240
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	-.037	.134	.076	1	.783	-.299	.225
	[prop.Gewicht=15 kg]	-.237	.138	2.945	1	.086	-.507	.034
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.391	.137	8.204	1	.004	-.659	-.124
	[prop.Reistijd=15 minuten]	-.424	.136	9.686	1	.002	-.691	-.157
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.553	.137	16.202	1	.000	.284	.822
	[prop.Openigstijden=7:00-22:00 uur]	.651	.138	22.222	1	.000	.381	.922
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.039	.137	.081	1	.776	-.307	.229
	[prop.Betaling=30 minuten]	.072	.136	.281	1	.596	-.195	.340
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.074	.136	.293	1	.588	-.340	.193
	[prop.Assistentie=Persoonlijke]	.086	.137	.396	1	.529	-.182	.354
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[Opleiding=1]	.565	.258	4.800	1	.028	.060	1.070
	[Opleiding=2]	.725	.313	5.361	1	.021	.111	1.338
	[Opleiding=3]	.341	.140	5.959	1	.015	.067	.614
	[Opleiding=4]	0[a]	.	.	0	.	.	.

Model of master's degree or higher

Parameter Estimates

		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[KeuzeOptie_2 = 1]	-.346	.236	2.147	1	.143	-.809	.117
	[KeuzeOptie_2 = 2]	.534	.236	5.112	1	.024	.071	.998
	[KeuzeOptie_2 = 3]	2.014	.248	66.068	1	.000	1.528	2.499
Location	[prop.Waarde=â,¬ 250]	-.203	.142	2.031	1	.154	-.482	.076
	[prop.Waarde=â,¬ 450]	-.331	.141	5.469	1	.019	-.608	-.054
	[prop.Waarde=â,¬ 50]	0[a]	.	.	0	.	.	.
	[prop.Levensduur=Kort, 1 dag]	-.512	.144	12.647	1	.000	-.794	-.230
	[prop.Levensduur=Lang, 7 dagen]	-.309	.140	4.872	1	.027	-.584	-.035
	[prop.Levensduur=Onbeperkt]	0[a]	.	.	0	.	.	.
	[prop.Grootte=Gemiddeld, Verhuisdoos]	-.035	.139	.062	1	.804	-.308	.238
	[prop.Grootte=Groot, Koelkastdoos]	-.783	.144	29.754	1	.000	-1.064	-.502
	[prop.Grootte=Klein, A3-doos]	0[a]	.	.	0	.	.	.
	[prop.Gewicht=10 kg]	.070	.142	.241	1	.624	-.209	.348
	[prop.Gewicht=15 kg]	.097	.142	.466	1	.495	-.181	.375
	[prop.Gewicht=5 kg]	0[a]	.	.	0	.	.	.
	[prop.Reistijd=10 minuten]	-.185	.142	1.693	1	.193	-.463	.093
	[prop.Reistijd=15 minuten]	-.239	.141	2.864	1	.091	-.516	.038
	[prop.Reistijd=5 minuten]	0[a]	.	.	0	.	.	.
	[prop.Openigstijden=24 uur]	.732	.145	25.469	1	.000	.448	1.016
	[prop.Openigstijden=7:00-22:00 uur]	.641	.144	19.717	1	.000	.358	.924
	[prop.Openigstijden=8:00-17:00 uur]	0[a]	.	.	0	.	.	.
	[prop.Betaling=15 minuten]	-.141	.142	.992	1	.319	-.419	.136
	[prop.Betaling=30 minuten]	.035	.140	.061	1	.805	-.240	.310
	[prop.Betaling=45 minuten]	0[a]	.	.	0	.	.	.
	[prop.Assistentie=Geen]	-.101	.144	.490	1	.484	-.384	.182
	[prop.Assistentie=Persoonlijke]	.189	.141	1.807	1	.179	-.087	.466
	[prop.Assistentie=Virtuele]	0[a]	.	.	0	.	.	.
	[Opleiding=5]	0[a]	.	.	0	.	.	.

OVERVIEW TABLE OF ATTRIBUTES PER GROUP

An overview of difference of all attribute estimations that are divided is several groups.

Attribut levels	Overall model	Men	Women	Age up to 30 years	Age 30 year and above	Bachelor or lower	Mater of higher	House-holds 1,2,5,6	House-holds 3,4	Inside Randstad	Outside Randstad	High urbaniza-tion	Lower urbaniza-tion	Distance to PPG till 5 minutes	Distance to PPG more than 5 minutes
[KeuzeOptie_2 = 1]	-0,465	-0,618	-0,264	-0,603	-0,594	-0,494	-0,346	-0,720	-0,273	-0,281	-0,653	-0,334	-1,088	-0,472	-0,293
[KeuzeOptie_2 = 2]	0,523	0,448	0,634	0,435	0,367	0,616	0,534	0,371	0,674	0,650	0,422	0,633	-0,031	0,536	0,701
[KeuzeOptie_2 = 3]	2,011	1,987	2,067	2,067	1,724	2,123	2,014	2,027	2,006	1,960	2,091	2,196	1,432	1,879	2,328
[prop. Value, € 450]	-0,165	-0,114	-0,248	-0,173	-0,174	-0,137	-0,203	-0,294	-0,056	-0,0749	-0,270	-0,170	-0,136	-0,266	-0,105
[prop. Value, € 250]	-0,354	-0,343	-0,385	-0,396	-0,317	-0,396	-0,331	-0,496	-0,266	-0,233	-0,471	-0,330	-0,429	-0,459	-0,298
[prop. Value, € 50]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. Short, 1 day]	-0,374	-0,477	-0,196	-0,448	-0,296	-0,259	-0,512	-0,358	-0,364	-0,258	-0,466	-0,348	-0,436	-0,445	-0,359
[prop. Long, 7 days]	-0,310	-0,237	-0,360	-0,318	-0,300	-0,322	-0,309	-0,377	-0,270	-0,327	-0,267	-0,375	-0,271	-0,260	-0,376
[prop. Unlimited]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. Big, freezer size]	-0,648	-0,717	-0,587	-0,785	-0,498	-0,513	-0,783	-0,542	-0,766	-0,797	-0,505	-0,574	-0,798	-0,655	-0,671
[prop. Average, transport	0,065	0,150	-0,074	0,010	0,127	0,152	-0,035	0,018	0,118	0,069	0,030	-0,049	0,145	0,084	0,057
[prop. Small, A3-format	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. Weight, 15 kg]	0,015	0,005	0,026	-0,121	0,124	-0,037	0,070	-0,012	0,043	0,138	-0,084	0,188	-0,165	0,070	-0,037
[prop. Weight, 10 kg]	-0,051	-0,084	-0,039	-0,090	-0,042	-0,237	0,097	-0,035	-0,107	-0,087	-0,027	0,090	-0,174	-0,022	-0,098
[prop. Weight, 5 kg]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. 15 minutes]	-0,292	-0,202	-0,416	-0,204	-0,361	-0,391	-0,185	-0,063	-0,505	-0,281	-0,298	-0,096	-0,594	-0,074	-0,426
[prop. 10 minutes]	-0,332	-0,281	-0,408	-0,353	-0,295	-0,424	-0,239	-0,228	-0,414	-0,296	-0,366	-0,216	-0,550	-0,286	-0,377
[prop. 5 minutes]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. 24 hours]	0,642	0,486	0,853	0,781	0,505	0,553	0,732	0,704	0,624	0,453	0,826	0,590	0,700	0,899	0,482
[prop. 7:00-22:00 hours]	0,633	0,548	0,766	0,804	0,469	0,651	0,641	0,783	0,496	0,504	0,790	0,508	0,738	0,801	0,542
[prop. 8:00-17:00 hours]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. First 15 minutes]	-0,072	-0,103	-0,004	-0,035	-0,118	-0,039	-0,141	0,057	-0,188	-0,177	0,035	-0,085	-0,022	-0,080	-0,062
[prop. First 30 minutes]	0,074	0,110	0,028	0,069	0,065	0,072	0,035	0,153	-0,023	0,024	0,094	0,057	0,107	0,075	0,072
[prop. First 45 minutes]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a
[prop. No assistant]	-0,085	-0,018	-0,195	0,024	-0,191	-0,074	-0,101	-0,161	-0,059	0,024	-0,219	-0,125	-0,026	-0,235	0,021
[prop. Personal aassistant]	0,128	0,109	0,144	0,222	0,058	0,086	0,189	0,202	0,062	-0,012	0,264	0,040	0,253	0,090	0,170
[prop. Virtual assistant]	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a	0a