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The added value of online and offline channel integration

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Preface

This report is the result of my graduation project for the master track Real Estate Management & Development at Eindhoven University of Technology. Finishing the study would have not been possible without the patience, support and feedback of the persons who have assisted me during this period.

The great support I have received from my brother Jan and my colleagues helped me a lot. I would like to thank them for the superb encouragement and giving me the time to finish my graduation project. Secondly, I would like to thank my supervisor Theo Arentze, for the great feedback on my work and the patience during the graduation period. Next, I would also like to thank Pauline van den Berg and Peter van der Waerden for their feedback, expertise and help with the research design. Also, I would like to thank my parents Jan and Adrienne for giving me the opportunity to study on the TU/e, their support, help and guidance during the period of my study. Furthermore, I would like to thank all participants of the survey for their opinion and time to fill in the questionnaire.

Thank you for the support and encouragement that helped me to finish this research. I would like to wish you pleasant reading and hopefully you enjoy it as much as I did writing it.

Paul Heijmans

Eindhoven, September 23, 2018

Summary

The use of the internet made an incredible growth since 2000. Computers, smartphones, and tablets are part of our everyday life. Since the introduction of the Internet, many activities have become easier to do from a distance, such as (tele)commuting, (e-)banking, and also (online) shopping. The Internet has not only changed how we work and live, but also how and where we shop. Consumers shop more online, which has an influence on physical stores and traditional retail strategies. Most retailers' online and offline stores are separate from each other. However, when channels are siloed, they cannot strengthen each other. Knowing how different channel integration design elements affect customer outcomes can be helpful for retailers to adapt their strategy. Research into choice behavior and added value of online and offline channel integration is scarce. The research objective of this study was *to gain insight into the added value of online and offline channel integration for consumers and to determine its effect on their choice behavior while shopping.* Online and offline channel integration is defined as the degree to which different channels interact with each other to create a seamless experience. One way to integrate channels is to provide information and access about the online store at the physical store, and the other way is to do the reverse. The following research question was formed: *What is the added value of online and offline channel integration and to what extent does the presence of channel integration influence the choice behavior of consumers when choosing between retailers?* By gaining information about consumers' preferences, retailers can adjust their strategy for the future. This empirical study into the added value of online and offline channel integration required a data collection with multiple variables.

First, a literature study was conducted; information was gathered about retail strategies, consumers' purchase behavior, the purchase process, and online and offline channel integration. Psychographic characteristics that were found in literature also influence shopping behavior. These psychographic characteristics that are described in literature are: price consciousness, shopping enjoyment, innovativeness, motivation to conform, loyalty, and time pressure. Different retailer characteristics can influence the purchase decision process and consumers' preference for where to shop. The characteristics that consumers weigh in their decision when choosing a retailer are product price, product range / assortment width, guaranteed stock, and available product information. Online and offline channel integration can take place in multiple phases during the purchase process, such as the pre-purchase phase, the purchase itself, or during the aftersales phase. The most common types of online and offline channel integration are integrated branding within all channels, an integrated customer relationship management (CRM) system with all customer and order data, integrated product information within all channels, integrated stock information within all channels, integrated pick-up options for orders, integrated return options within all channels, and integrated aftersales customer service within all channels. When combined, the most important retailer characteristics that were used in the research design were:
- Purchase channel to buy the product;
- Pick-up channel to receive the product;
- Guaranteed stock information about the product/item;
- Return options for exchange or refund;
- Price range of the retailer;
- Product range/ assortment width of the retailer; and
- Quality of the products available at the retailer.

The data was collected with an online questionnaire that was divided into two different sections. The first section asked for socio-demographic characteristics, psychographic characteristics, and consumers' shopping frequency. The second section contained a stated choice experiment with nine different choice tasks. Each choice task contained two choice

alternatives, each of which had varying levels. In total, seven attributes were developed, each with two or three attribute levels.

The research sample consisted of 260 respondents, the majority of whom were women (80%). The average age of all respondents was 45. Most respondents shopped online instead of in a physical store. Using different statements on a 5-point Likert scale, information was collected about the psychographic shopping characteristics. The characteristics with the highest, average score were economic and motivation to conform. However, the differences between the scores of all psychographic characteristics were not very large.

To obtain more information about the consumers' choices and the considerations in retail, a multinomial logit model and latent class model were estimated. In addition, chi-square and independent-samples T-test were conducted to find relationships with the socio-demographic variables. According to the multinomial logit model, the attributes with the highest importance were "product price" and "product availability". For product price, the lowest price was preferred when choosing between retailers. In addition, product availability at the store was also preferred over uncertainty about stock. In addition, it likely that consumers go searching elsewhere for the product they need, if products are not available at their first retailer of choice. Next to price and product availability, the channel from which to buy and receive the product was also important. Most of the time, respondents preferred the online store and home delivery. Their second preference was buying and obtaining the product at the physical store. When choosing between retailers, the options to return products were less important for consumers. However, the results still showed that the preference was to return products at a local pick-up point for free. Fewer liked the options to pay for the return or arrange the return themselves.

Several latent class models with varying classes were estimated, and overall the latent class model with two classes performed the best. According to this model, consumers who found product prices less important (class I, *active shoppers*) found product availability and return options significantly more important than others. These shoppers had a higher preference for good product availability and options to return products for free. Additional services, such as the option to return a product by using a pick-up point, were important for them. Furthermore, active shoppers did not prefer to pay the lowest product price, but they also did not prefer to pay more than average. Those in class II, *price conscious consumers,* found product prices the most important. Information about product availability and options to return products were also considered less important. These consumers could prefer different options to return products for low costs, but these were still less important than actual product price. Chi-square tests and independent-samples T-test were used to find significant differences between the latent classes. Such differences were found for the variables age and shopping frequency: *active shoppers (class I)* were significantly younger and also tended to shop more both online and in physical stores.

Multiple managerial implications can be derived from the results. First, consumers appreciate information about product availability at a retailer. Hence, to attract consumers, both online and physical stores need to make their current stock clear and easily visible across multiple retail channels. Retailers with a physical store need to create an integrated online channel that presents the store's stock information. When a physical channel and an online channel are combined, it is necessary to show the current stock in both channels. Furthermore, consumers who often buy apparel also appreciate options to return their order. The consumer may choose an online or a physical store, and therefore no channel distinction should be made for the return process. Easy options to return apparel can be implemented at future retailers. Returning an order for free at a pick-up point in the neighborhood was most preferred in this

study. Additional services should not lead to additional costs for the consumer, because in most situations a lower price than average is preferred.

Finally, the limitations of the study led to recommendations for future research. First the stated choice method was used to collect data. However, a disadvantage of this method can be the design of the experiment. For instance, the attributes' comprehensibility can cause difficulties in interpreting the meaning of these attributes. The comprehensibility was also mentioned by some respondents. Examples of attributes that caused confusion in this study are "product range" and "purchase history". A better explanation of the attributes and attribute levels would give a clearer presentation of the choice sets. Furthermore, another recommendation for future research is to use a larger research sample. By doing this, more methods of analysis could be used. In this study all profiles were well tested in the stated choice experiment, but the composition of the profiles could have been done more extended. Namely, with a larger sample, the variation of the attribute levels could be higher and would make it possible to measure more interaction effects. All in all, this study's results can improve current retail strategies, and the recommendations for future research could result in interesting findings for the retail sector.

Index

1 Introduction

1.1 Relevance

Shopping is part of our culture, and people often have several motives to shop; some of these are functional, product-oriented, and others are social. Sometimes, shopping even happens on impulse (Tauber, 1975). There has been an incredible growth of the Internet since 2000. Computers, smartphones, and tablets are part of our everyday life. Since the introduction of the Internet, many activities have become easier to do from a distance, such as (tele)commuting, (e-)banking, and (online) shopping. The Internet has not only changed how we work and live, but also how and where we shop. E-shopping can be defined as searching for and/or purchasing consumer goods and services via the internet. The Internet offers ways to search for product information, communication and selection, transaction, delivery (digital), and after sales (Farag, 2006; Mokhtarian, 2004).

Before the Internet, retail strategies were based on physical stores. However, consumers now shop more online, which has an influence on physical stores and traditional retail strategies. Market research showed a 22% increase in sales from 2014 to 2015 in The Netherlands (Thuiswinkel Waarborg, 2015). Similarly, a recent e-commerce market study by Thuis Winkel Waarborg observed an increase of 25% in online sales in the second quarter of 2016 compared to the same quarter in 2015 (Olsthoorn, 2016). The growth of the Internet and e-shopping has influences on retail strategies and leads to new ones.

Several ways and channels exist to approach, stimulate, and help consumers with their shopping needs. This study uses Neslin et al.'s, (2006) definition of a channel: ''a customer contact point, or medium through which the retailer and customer interact.'' The simplest form of retailing is single channel retailing; it consists of only one channel for selling, customer service, or advertising. An example is selling only from a physical store to a customer. On the other hand, multichannel retailing is "a distribution strategy to serve customers using more than one selling channel or medium such as the Internet, television, and retail outlets" (Stone et al., 2002). In this multichannel retailing, the channels are siloed. Finally, omni-channel shopping is the newest form of retailing. Compared to multichannel retailing, within omni-channel retailing the offline and online channels do not operate independently from each other but together. Omni-channel retailing is "an integrated sales experience that melds the advantages of physical stores with the information-rich experience of online shopping" (Rigby, 2011). Within this omni-channel retail strategy, the customer is at the center and all channel communication is seamless, transparent, and integrated. Consumers need to be served when, where, and however they want. The different channels within omni-channel retailing are presented as one brand with an equal appearance.

Part of omni-channel retailing is the integration of online and offline channels. In this retailing, it is necessary for this integration to be good to provide a seamless experience to the customer. One example of online and offline channel integration is providing the local brick-and-mortar store's inventory information within the online shopping channel. Online and offline channel integration can ensure product availability when purchasing at a physical store. This can lead to increased customer retention, as customers are not forced to search for the products they need elsewhere (Bendoly, 2005). This integration also influences physical stores. Most retailers still operate in a single channel or multichannel way and keep their online and offline stores separate from each other (Aberdeen Group, 2012). An example of siloed integration is the option to search online on the retailer's website for a physical store location, but without the possibility of checking the store's inventory, to order online, or to pick up the order at the store. When channels are siloed, they cannot strengthen each other. Earlier research by Accenture (2010), Gallino et al. (2012), and Herhausen et al. (2015) concluded that channel

integration will become the new standard in retail and can improve overall customer satisfaction. Changing the structure fast to decent online and offline channel integration is necessary for success.

In a previous study, Herhausen et al. (2015) concluded that a good online and offline channel integration has several positive effects on customers and their search and purchase intention. Furthermore, this integration increases the service quality of the online store. In this vein, Bendoly et al. (2005) state that online and offline channel integration also increases customer retention, while Gallino and Moreno (2012) suggest that providing reliable in-store inventory information online increases the number of store visits.

1.2 Problem definition

Since the rise of smartphones, social media, and e-commerce, retail strategies changed. The omni-channel strategy and concept of online and offline channel integration is rather new. Research on this topic is scarce and mostly dates back to 2012 (McCormick et al., 2014; Verhoef et al., 2010). Furthermore, few studies have examined choice behavior and added value of online and offline integration is scarce. Since 2012, some studies have concluded that online and offline integration can contribute to and strengthen both channels (Gallino et al., 2012; Herhausen et al., 2015). However, several questions remain: What is the added value of online and offline integration for consumers? How much are consumers willing to pay for good online and offline channel integration? What is the influence of online and offline channel integration when choosing a certain retailer? Added value or choice behavior is difficult to measure and is subject to many external influences. According to Gallino (2012), online and offline channel integration will increase the value proposition to customers; however, this research was based on single-channel data. Determining choice behavior or measuring added value needs to be more accurate so it can be used to optimize retail strategies. If a retailer's online and offline channel integration has an influence on consumers' choice of retailer X instead of Y, future developments in online and offline channel integration could influence the retail landscape significantly. This would for example give possibilities for retailers to increase sales and encourage store visits.

Knowing how different online and offline channel integration design elements affect customer outcomes can be helpful for retailers to adapt their strategy. As Rigby (2011) stated, traditional single-channel retailing is ending and the market share of online players is gaining. It is important for retailers to keep up and create an omni-channel strategy to better compete and to survive (Accenture, 2010; Heckmann et al., 2012). Online and offline channel integration is an important key factor in this omni-channel strategy.

1.3 Research objective

As stated above, research into online and offline channel integration is scarce. However, existing studies have concluded that online and offline channel integration has positive effects on customer retention and satisfaction. Online and offline channel integration can have an effect on choice behavior when choosing between retailer X and Y, and can also increase store visits and sales at a physical store (Gallino et al., 2012). If it was clear whether consumers value good online and offline channel integration and what options they value the most, it would be possible for retailers to optimize their strategy. Online and offline channel integration can be accomplished in several ways. Necessary for implementation is determining what integration options consumers appreciate the most. The research objective is to gain insight into the added value of online and offline channel integration for consumers and to determine its effect on their choice behavior while shopping with online and offline channel integration.

1.4 Research question

This section presents the research question and the sub-questions. The research question is *What is the added value of online and offline channel integration and to what extent does the presence of channel integration influence the choice behavior of consumers when choosing between retailers?*

To answer this research question, several sub-questions are formed. To address these, it is necessary to gain insight into types of online and offline channel integration and other important shopping preferences of consumers. By combining these two, the choice behavior can be analyzed to see the added value of online and offline channel integration in relation to other valued preferences.

1. What is online and offline channel integration and what types can be distinguished?
2. What options to implement online and offline channel integration exist for a retailer?
3. What is the effect of online and offline channel integration on consumers' preferences for shopping at a retailer with or without integration?
4. How much do consumers value online and offline channel integration preferences in comparison to other shopping preferences?

1.5 Scope

Several channels can be part of the omni-channel retail strategy, such as catalogs, the telephone, or door-to-door sales. However, this study excludes other channels than the online e-commerce channel and the physical store. After all, these two channels are the most important within the retail sector (Rigby, 2011; Verhoef et al., 2007). Online and offline channel integration can be implemented for all shopping categories, but this research focuses on retailers that sell apparel. The fashion industry plays a crucial role in the economy and social well-being in many regions in the world (McCormick et al., 2014)

1.6 Relevance

This section discusses the practical and scientific relevance of this research. First, the practical relevance is mainly that it determines the added value of online and offline channel integration. By gaining information about consumers' preferences, retailers can adjust their retail strategy for the future. By researching and analyzing consumers' preferences for channel integration, it is possible to determine the specific added value of this online and offline channel integration. Examples that can be implemented in a new retail strategy are integrating the stock quantity from the offline channel in the online channel, and allowing purchases to be returned in both the online and offline channels. This provides a starting point for retailers to adjust their strategy to an omni-channel one with online and offline channel integration.

Besides its practical relevance, this study's scientific relevance is also of importance. As mentioned in section 1.2, current research into omni-channel strategy, specifically in online and offline channel integration, is scarce. By using stated choice modeling, this study is able to examine this integration's added value and consumers' preferences for online and offline channel integration. This may result in new insights and avenues for further research on this subject.

1.7 Research design

Research questions 3 and 4 require a quantitative analysis. For this quantitative analysis, data is collected with a questionnaire using the stated choice method. Stated choice experiments can provide insight into shopping preferences. By using this experiment with choice sets and

attributes, it is possible to determine the importance of online and offline channel integration preferences. The sample for the data collection consists of consumers who shop online, offline, or both. No preselection was made in terms of age, gender, or demographic aspects. A customer base is used with approximately a few thousand consumers. The data is analyzed using the multinomial logit model and latent class logit model. The questionnaire also collected demographic and psychographic characteristics to identify and classify the consumers.

1.8 Report structure

This section describes the structure of the report, which is also visualized in Figure 1. Following this chapter, the literature is reviewed to answer the first and second research questions: "*What is online and offline channel integration and what types can be distinguished?*" and "*What options to implement online and offline channel integration exist for a retailer?*" This chapter presents more information about shopping preferences and about options for online and offline channel integration. The literature review is the foundation of the research design and data collection. Next, Chapter 3 presents the research design and theory. This includes the development of the questionnaire for data collection. Data collection started after implementing this questionnaire into the Bergenquete 2.2 system. Chapter 4 analyzes the results of the first variables concerning socio-demographic characteristics. After coding the dataset, the analysis is performed for the multinomial logit model and latent class model; all results of both models are given in chapter 5. This chapter contributes to answering the following research questions: "*What is the effect of online and offline channel integration on consumers' preferences for shopping at a retailer with or without integration?*" and "*How much do consumers value online and offline channel integration preferences in comparison to other shopping preferences?*" The second part of the last chapter presents Chi-square tests and independent-sample T-tests and combines them with the results of the socio-demographic characteristics and the defined latent class model. Finally, the report ends with the conclusion, which contains the research results, limitations of the study, recommendations for future research and the managerial implications.

H1. Introduction	H2. Literature review	H3. Research design	H4. Analysis and results	H5. Model estimation and results	H6. Conclusion

Figure 1 Schematic structure of the report

2 Literature review

Shopping is changing and has changed every decade on numerous aspects. This affects also the strategy of retailers and they need to adapt to these changes. Omni channel is a rather new retail strategy, research is scarce and the definition is not always clear (Beck & Rygl, 2015). The definition of omni-channel is very wide and to operate as an omni-channel strategy it is necessary to comply with all aspects. Online and offline channel integration is an aspect that will be further researched in this literature review. The first part of this chapter gives more information about current retail strategies and previous research of consumer purchasing behavior. This is followed by the motives for shopping and attributes and criteria that influence the purchase decision process. After this the literature review will focus on the online and offline channel integration during the purchasing process. This is in the end combined with research into several studies that questioned success and failure of the online and offline channel integration. Eventually this literature review will be the starting point of the research design and methodology.

2.1 Retail strategies

Berman et al. (2004) and Oh et al. (2012) discovered multiple effects of online and offline channel integration on consumers' shopping trips. Before implementing this integration, determining the retail strategy is the starting point. The strategy can be one of four types: single-channel retail, multi-channel retail, cross-channel retail, and omni-channel retail. Nowadays, the new standard is the omni-channel retail strategy (Chopra, 2016).

However, in academic research, the definitions of multi-channel, cross-channel, and omni-channel retail strategies are rather confusing, and their implementation differs among academics. For instance, Neslin et al. (2006) describe multi-channel retailing as a form of retailing with various integrated channels but without mutual interaction between those channels. This is in contrast to Berman et al. (2004), who define multi-channel retail as channel integration with mutual integration between the channels. Furthermore, the definition of cross-channel is also described in various ways. Neslin et al. (2006) define cross-channel as the interaction with channels that are integrated, while Brynjolfsson et al. (2009) state that the channels are not integrated. In addition, Vehoef et al. (2015) mention that omni-channel management is sometimes referred to as cross-channel management, which is in line with other research (Beck & Rygl, 2015).

All aspects of retailing happen through a channel, whether it is buying products, contacting customer service, or advertising. Görsch (2002) defines a "channel" as a touchpoint where consumers and retailers interact for information and marketing. Multiple types of channels exist, such as store fronts, mobile channels, or paper-based catalogs. However, Görsch (2002) only includes the marketing aspect in his definition. In contrast, Neslin et al (2006) make a more general distinction between channel types, like stores, websites, and catalogs, and define a channel as a contact point or medium to interact with consumers. This general contact point can be used not only for advertising or marketing, but also to search for products, sales, aftersales, and all other aspects of shopping. Neslin's (2006) definition is more extensive and contains the whole purchasing process.

Single-channel retailing is the most stripped-down retail strategy and stands for selling products and taking advantage of only one channel for advertising, sales, and customer service (Verhoef et al., 2015). The second and more developed retail strategy is multi-channel retail. The definition of a multi-channel retail strategy is to serve customers throughout multiple selling or customer service channels. These channels have a siloed structure and operate independently from each other. When siloed, no internal interaction between channels occurs.

For instance, it is not possible to buy the product in one channel and return it in a different one. The siloed structure also means that the product range or prices from a catalog channel can be different than in an online channel (Herhausen et al., 2015). The third retail strategy to implement is a cross-channel retail strategy; this is an improved multi-channel retail strategy. The term "cross-channel synergy" was also developed to define this integrated channel structure (Neslin et al., 2006). Cross-channel retail gives the customer the opportunity to choose between the different channels of one retailer. This gives the customer the possibility to shift between customer service, information, and sales channels. Previous research has concluded that cross-channel strategy has an important influence on customer behavior, and positive effects on the customers' trust and loyalty (Schramm-Klein, Wagner, Steinmann, & Morschett, 2011). Consumers switch between several channels fast; for instance, they use the retailer's website on their mobile device while walking into the physical store itself. Cross-channel retail gives them the opportunity to use both channels. The fourth, most developed strategy for a retailer is an omni-channel strategy. This creates a seamless interaction with the customer and can be described as customer-centric retailing. The definition of omni-channel is very wide. With the use of automated processes, it is possible to integrate a seamless experience into all channels: mobile, the physical store, social media, and other new technologies (Accenture, 2010). Business experts often use the term omni-channel and refer to it as a seamless customer interaction throughout various channels with the customer as the center point. Compared to multi-channel and cross-channel retail strategies, more interplay between occurs channels and brands within omni-channel retailing. This implies that different channels and touchpoints are constantly interchangeable for consumers and retailers can assist them with the same retail experience at the same time (Verhoef et al., 2015).

2.2 Academic research in consumer purchasing behavior

Prior studies have investigated consumer preferences for different retailers or channels, and the influence of a retail strategy on consumers' preference for shopping in an online or offline channel (Muthitacharoen et al., 2006). However, most studies have not considered the influence of online and offline channel integration on consumers' preferences or their willingness to pay for online and offline integration.

Levin et al. (2003) examined consumers' preferences for shopping online or offline. Using surveys and two experiments, they tested the channel preferences for each shopping category, distinguishing between the online channel and the offline channel. For multiple product categories, the study investigated the features and consumers' preferences for shopping online or offline. For instance, consumers preferred the online channel when products had features with large selections and large amounts of information to which they required quick access. For products that required personal service, smell, touch, and seeing before buying, consumers were more likely to prefer using the offline channel. However, this preference for an offline channel could also change when an online channel offered lower barriers for guaranteed free returns and exchange (Levin et al., 2003).

Muthitacharoen et al. (2006) have also contributed to the research on consumers' preferences. Their study examined the influence of a retail strategy with multiple channels on the preference for buying in the online or offline channel. Attributes of influence that were included were transaction costs, social interaction preferences, product references, and perceived risks. However this research mainly examined which of the two channels was preferred for a specific attribute; it did not include the influence of channel integration of the consumers' preference (Muthitacharoen et al., 2006). For instance, channel integration has an influence on the attribute "product availability." When channel integration can ensure product availability to a consumer, the need to go searching for the product elsewhere decreases. This leads to overall

increased customer retention (Bendoly, 2005). Research on consumer preferences including channel integration will lead to different outcomes.

In another study, Keen et al. (2004) conducted a conjoint analysis to evaluate consumer preferences for three retail channels. This method was used to find the individual importance of each of the following attributes: format or channel (internet, catalog, retail), effort to purchase (little, much), level of control during purchase (little, much), norm for influence from others (5%, 85%), attitude (positive, negative), and price (low, medium, high). In this research, online shopping was not seen as a competitor of shopping in the physical channel (Keen et al., 2004). On the other hand, this study was performed almost 10 years ago; the channels that people choose to purchase products have changed a great deal, and online and offline shopping are combined (Chopra, 2016). More recent studies have also emphasized that online shopping has become more important, and consumers' preferences have therefore probably also changed over time (Heckmann et al., 2012; Parsons, 2006; Wang, et al. , 2015). Instead of focusing on both offline and online channels, Chen et al. (2010) only focused on attributes and features of online channels that influence and strengthen purchase behavior. The authors identified different groups of consumers using conjoint analysis. The attributes that the consumers valued the most and that stimulated purchase behavior differed for each group, but included usability, delivery, security, trust, and convenience. This study did not include attributes containing channel integration (Chen et al., 2010). However, combining channel integration with these attributes could lead to different outcomes, considering that previous research has suggested that channel integration could generate increased sales (Berman & Thelen, 2004; Neslin et al., 2006).

Zhang (2008) also examined consumer preferences only, without considering channel integration. This study considered the influence of the product type and purchase process on the choice for an online or offline channel. The results indicated that high-product complexity can affect the choice to purchase in an offline channel. For instance, it is easier to ask questions and demonstrate products in the store (Zhang, 2008). However, technology for online channels is changing rapidly, and there are high-quality video and audio opportunities with almost unlimited space. This is optimal for demonstrating and explaining how to use products.

2.3 The purchase process and influences in shopping behavior

In academic research, online and offline channel integration is rather new, and with more retailers choosing an omni-channel strategy, the demand for research on this topic is increasing. During the purchase process, online and offline channel integration can take place in multiple phases. The following sections clearly distinguish between multiple purchase process theories and influences on shopping behavior.

2.3.1 The purchase process

The definition and phases of the purchase process differ among studies. For instance, Görsch (2002) propose the PCP: *purchase and consumption process (visible in Figure 2)*. The PCP is a model of the purchasing process of a product from the initial stage to the last stage when the product is used or service and aftersales are required. This model is the most comprehensive and also includes the consumption process. The PCP gives a clear identification of the stage the consumer is in during the process of shopping (Görsch, 2002).

need recognition → search & decision → transaction (order & payment) → product receipt → return / exchange → consumption or use / repair etc.
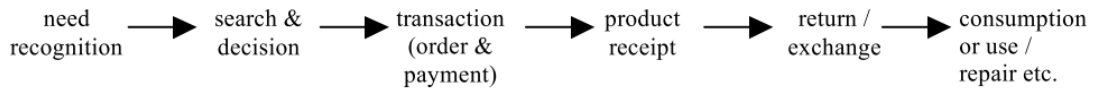
Figure 2 Purchase and consumption process by Görsch (2002)

Without using the PCP, Neslin et al. (2006) define the purchase process almost equally except for the first, third, and fourth phase. In contrast, Steinfield et al. (2002) only define three stages for shopping: the prepurchase, purchase, and after-sales phases. The added value of the PCP is that it also contains the consumption process, part of which is the consumption and use/repair afterwards (Görsch, 2002). Combining all the different definitions and phases, the purchase process has three stages within which different aspects of shopping can take place

Table 1 Purchase and consumption process by Görsch (2002), Steinfield et al. (2002) and Neslin et al. (2006)

Görsch, (2002)	Need recognition	Search & decision	Transaction (order & payment)	Product receipt	Return/ exchange	Consumption or use/ repair etc.
Steinfield et al. (2002)	Pre-purchase/ Information phase		Purchase phase		Postpurchase Phase	
Neslin et al. (2006)	Problem recognition	Search	Purchase		After Sales	Post Evaluation
	Pre-purchase/ search phase		Purchase phase		After Sales phase	

The different activities that take place during the purchase process defined as in Table 1 are shown in Table 2. Within these phases also online and offline channel integration will have an impact. online and offline channel integration takes for the most part place in the pre-purchase phase, purchase or during the aftersales phase (Berman et al., 2004; Chopra, 2016). In the section 1.2.1 the motives for going shopping that take place in the initial pre-puchase phase will come forward. These motives are based on multiple aspects and can be personal or social.

Table 2 Defined purchase process

Phase	Contains
Pre-purchase phase / search phase	Need and problem recognition, information search, purchase decision
Purchase phase	Order placement, transaction/payment, product receipt, pick-up order
After Sales phase	Return, exchange, consumption, repair, after sales, product support

2.3.2 Motives for shopping

In the pre-purchase stage, awareness arises, followed by the demand for a product or service. This can often be a result of a problem that requires a solution, but problem solving is not the only reason to shop or buy a product. In earlier research, Tauber (1975) summarized multiple motives to shop or buy a product. In this well-known work, two main categories with several hypothesized motives were based on an exploratory study with individual in-depth interviews. The main categories for shopping motives are personal and social. However, Dawson et al. (1990) highlighted more motives or reasons to shop reported in the literature, which they summarized in three categories: product-oriented shopping, experimental shopping, and the mix of product-oriented and experimental shopping.

2.3.3 Personal motives for shopping

Personal motives to shop can be divided into four different motives that each influence a person differently. In some situations, it is possible for the *role of a person* in social life to be a motive to shop – for example, the role as housewife, mother, husband, or student. Grocery shopping is for instance often done by the person who views it as part of his or her family role (Tauber, 1975). However, a growing trend in online grocery shopping is visible. Important

motives for people to shop for groceries online are time-saving and convenience (Cude et al., 2000). Another motive can be *diversion*, like using shopping to change one's daily routine and as a form of recreation (Tauber, 1975). This way of shopping can be described as entertaining and relaxing, also known as fun shopping (Gorter et al., 2003). When shopping in an emotional state or mood – for example, when feeling lonely or bored – the motive can be *self-gratification.* This can lead to shopping with personal motives, and the shopper will pamper him- or herself (Tauber, 1975). Furthermore, learning and looking for trends are also shopping motive. *Learning about new trends*, such as gaining information about the latest fashion, styling, and product innovation, can be a personal motive to come up with new ideas (Tauber, 1975). In addition, people who shop can be satisfied with the *physical activity*; it can in fact fulfill their daily physical and exercise needs. Interestingly, in the Netherlands physical activities like walking and cycling are important modes of transport for shopping trips (Farag, 2006; Tauber, 1975). Finally, the last personal motive is s*ensory stimulation*, where consumers have sensory benefits and enjoy handling the merchandise, trying it on, or testing it. Sound or smell can also influence it (Tauber, 1975). However not all personal motives above are applicable to online shopping. In recent decades, shopping has evolved more, and online shopping has become important; it did not yet exist in 1975. Recent empirical research describes only three of Tauber's (1975) seven motives for online shopping: diversion, self-gratification, and learning about new trends (Parsons, 2006).

2.3.4   Social motives for shopping

Next to personal motives, social motives also contribute to shopping. For instance, the *social experiences outside the home,* like markets or shopping centers, can result in great opportunities to interact with friends, neighbors, or new acquaintances (Tauber, 1975). As stated by Cude et al. (2000), going grocery shopping online results in missing this direct social contact and can also be an obstruction. Another social motive is the *communication with others with a similar interest,* such as visiting hobby centers to collect special items or sharing and talking with others about one's hobbies or interests. This is similar to *peer group attraction,* like locations that attract specific groups. The interests can differ between these specific groups or visitors. For instance, record stores can attract teenagers, and the peer group can motivate people to develop an interest in the store or products. When different locations for shopping exist, peer group attraction can also result in the choice to shop at another location (Gorter et al., 2003; Tauber, 1975). Another motive is the *status and authority* that a person feels while shopping, for instance in an expensive store. With this motive, a person will expect to be "waited on" without having to pay for the service, which gives his or her a feeling of status and power. In complete contrast, another motive that gives shoppers the feeling of power is *pleasure of bargaining:* bargaining the price of a product to a more reasonable price (Tauber, 1975). Not all of these social motives are of influence for online shopping. More recent research found empirical evidence that four social motives influence the choice for online shopping: only social experiences, communication with others with similar interests, peer group attraction, and authority.

2.3.5   Personal and social shopping motives simplified

Tauber's (1975) personal and social motives can be transferred into three main motives, as described by Dawson et al. (1990). First, product-oriented shopping consists of going to a store for a specific product; for example, when someone needs a present for a birthday, a specific product motive is visible. The second main motive is leisure shopping, also known as experimental shopping, where fun and pleasure are the main reasons. The hedonic and recreational orientation is growing and increasingly accepted. Next, a product-oriented experimental motive combines the elements of product-oriented and experiential motives. This is the case when the needs for a specific product and recreational shopping are combined by looking for that product in a store or shopping mall. Consumers with product-oriented

motives also tend to have more pleasure when shopping and are more likely to buy products compared to shoppers with experiential motives (Dawson et al., 1990).

Table 3 Shopping motives by Tauber (1975) and the shopping motives by Dawson et al. (1990)

Online channel	Physical channel		Product oriented shopping	Experiential shopping	Product oriented and experiential shopping
Personal Motives					
	x	• Role of a person (in society)	x	x	
x	x	• Diversion		x	
x	x	• Self-gratification		x	
x	x	• Learning about new trends	x	x	x
	x	• Physical activity		x	
	x	• Mental activity		x	
	x	• Sensory stimulation	x	x	x
Online motives					
x	x	* Social experiences outside the home		x	x
x	x	* Communication with others have the same interests	x	x	x
x	x	• Peer group attraction	x	x	x
x	x	• Status and Authority		x	x
	x	• Pleasure of Bargaining		x	

These three motives mostly concern general shopping. For online shopping, choices are made based on convenience or variation in product range. Saving time when shopping online is also important for the group that shops online for convenience (Rohm et al., 2004). Table 3 combines these different motives and links them to different theories.

2.3.6 Psychographics in retail

Earlier research by Konuş et al. (2008) revealed that different psychographic characteristics have an influence on consumers' shopping preferences. These authors examined price consciousness, shopping enjoyment, innovativeness, motivation to conform, loyalty, and time pressure; they analyzed the collected psychographic and socio-demographic data with a latent class model and found no relationship with the socio-demographic characteristics such as age or education. The psychographic variables were therefore more important than the socio-demographic characteristics used in their research (Konuş et al., 2008).

The price consciousness psychographic characteristic is the extent to which a consumer will focus on the price of a product. In their decision, consumers can for instance use the advantage of channel integration to find the lowest price. On the other hand, shopping enjoyment is a characteristic without a focus on price, but on entertainment and emotional benefits for consumers. Another psychographic characteristic is innovativeness, which refers to consumers' ability to collect new, innovative experiences and try out new products. In some decisions, the main reason for channel selection can be time pressure, leading to a preference for the online channel; this is also a psychographic characteristic (Konuş et al., 2008). Furthermore, Shim et al. (1994) used motivation to conform, or so-called self-improvement, to define profiles based on psychographics and shopping orientations, patronage behavior, and demographics. Both Shim et al. (1994) and Konuş et al. (2008) implemented this psychographic characteristic in the same way. Finally, the last psychographic characteristic is

loyalty, which refers to often buying products from the same retailer or brand (Konuş et al., 2008).

2.4 Attributes and criteria that influence the purchase process

Certain attributes and criteria can influence the purchase decision process and consumers' preference for where to shop. To answer research question 4, it is important to gain insight into consumer preferences. For purchasing decisions, consumers weigh multiple criteria and attributes of retailers and their products so they can make the best choice. Examples of attributes that contribute are price, branding of the retailer, opening hours, online reviews, and depth of product range. These attributes and criteria can have an effect on the retailer and store itself, or on the products offered by the retailer. The following provides a more extensive explanation based on multiple studies.

2.4.1 Price & discount

The price of a product or brand can be a characteristic that will make consumers choose a certain retailer. The price of a certain product can have an influence on the buyer's perception of quality (Grewal & Baker, 1998); this is in line with Eun Lee and Stoel (2014), who found a correlation between low prices as a result of discounts and a high perceived risk in product quality (Eun Lee et al., 2014). Using a conjoint analysis, Keen et al. (2004) also found a high price sensitivity to online purchase preferences among consumers. For multiple product categories, the price of the product was one of the most important attributes (Keen et al., 2004). Consumers with stronger price-search intentions have an advantage when shopping online, as it gives them more opportunities to compare prices at multiple retailers and lowers the search effort. The consumer's income can also influence the store choice based on a preferred price range (Gehrt et al., 2004; Gupta et al., 2004). In addition, price is one of the most critical criteria in the purchase decision process (Chen-Yu et al., 2002; Williams et al., 1995). However, price importance also differs between product categories: it is higher when shopping for more expensive products. However not only price is an important aspect in consumer preferences: brand name can also be significant (Zeithaml, 1988).

Discounts can be attractive for consumers to shop at a certain retailer. However, they also influence the perceived quality of the brand and the store's overall image, and can lead to increased risk perception for buying products. Especially for products with a large discount, the consumer will hesitate and expect unknown failure effects or higher risks. Large price discounts that increase perceived risk will not always lead to an increase in sales. Furthermore, this effect can be more pronounced for online channels (Eun Lee et al., 2014; Grewal et al., 1998).

2.4.2 Product brand or retailer brand

As stated above, branding is an important characteristic for consumers in the purchasing decision process. If consumers repeatedly buy the same products, they often choose the brand with which they are familiar and use brand awareness, package, and price in their choice. Brand awareness plays a large role in consumers' choice behavior (Macdonald & Sharp, 2000). Consumers who are brand and fashion conscious when shopping usually pay attention to the store brand name, while sale prices are less important for them (Chen-Yu et al., 2002). The availability of familiar brands in the online channel can persuade consumers to purchase a product, as they mostly prefer these familiar brands (J. Park et al., 2005). In some situations, store brands are available instead of only manufacturer brands. With a large quality difference, however, it is believable that consumers will choose the manufacturer brands instead of the store brands. The store image often affects the consumers' expectation of the store brand's quality. Moreover, store brands often offer multiple products in different categories, and negative experience in one category can affect the consumers' expectation of quality for another category. When a store brand offers highly complex products, the consumers will

develop a negative attitude towards them. This is a result of a higher perceived functional risk of these products (Semeijn et al., 2004). Earlier research has already confirmed that store image is important and that retailers have started to invest more in it. The store name and image delivers much information to consumers. For instance, retailers can convey an image of their store as luxurious, with high-quality customer service and products. The brand name of a product also matters to consumers and their perceptions of product quality. High-quality products have an influence on store image and a significant effect on consumers' purchase intentions (Grewal & Baker, 1998). For impulse shopping, store image is the main driver, as the decision is a last-minute one. Multiple aspects can contribute to store image and affect impulse shopping, such as attractive store windows and product presentation (Chen-Yu et al., 2002).

2.4.3   Pick-up possibilities

Retailers that offer the option to order online and pick up at the store can deliver extra added value, and previous research has concluded that this leads to higher customer retention (Chatterjee, 2010). This is already highly popular in France, where more than 20% of online orders are delivered at a pick-up point. Pick-up points, also known as collection-and-delivery points, are the solution to home delivery failures. Important for this characteristic is that consumers prefer this option when ordering online and if the collection-and-delivery points are within a 5-minute distance of their home address. Hence, lower urban density will decrease the preference and use of collection-and-delivery points (Weltevreden, 2008). More recent research confirms that collection-and-delivery points are becoming increasingly important. This way of delivering parcels also contributes to emission-free inner cities (Duijn et al., 2017).

2.4.4   Online reviews

The availability of online retailer reviews can affect consumers' preferences for buying at a certain retailer or not. Chatterjee (2001) researched the availability and use of these reviews and found that when available, consumers usually check them, unless they are familiar with the online shop. Little research has examined online reviews of retailers compared to research of online product reviews. The latter have a high impact on new product sales, and more popular products in particular have more reviews. The available percentage of negative reviews has a higher effect than positive reviews, and negative reviews therefore have a larger impact on consumer purchase decisions (Cui et al., 2012). However, not all reviews reveal the true product quality. This is because not all consumers will place reviews: it is mostly consumers who have a certain motivation to brag or moan (Hu et al., 2006). Finally, the availability of consumer product reviews can also decrease the uncertainty and risk regarding new purchases (Cui et al., 2012).

2.4.5   Aftersales

Aftersales is important for customer behavior and future purchase decisions. Overall, well-developed and high-quality service in aftersales will influence customer satisfaction. Moreover, the relationship between the customer and the retailer will benefit, resulting in higher customer retention. Customer satisfaction will also improve behavioral intentions, which can lead to re-purchase intentions. For retailers, good aftersales quality is positive and matters in both the short and long term (Rigopoulou et al., 2008).

In the aftersales phase, it is crucial for the customer that the channel's perceived convenience is high. It needs to be easy for a customer to be in contact through all available channels, like the physical store and the online channel. This is perceived as pleasant for the consumer and leads to higher customer satisfaction (Gensler et al., 2012).

2.4.6 Available product information

Previous studies on available product information in online channels found that information quality and user interface can affect user information satisfaction, which influences commitment to an online store. Thus, information satisfaction is important for consumer retention and purchase behavior. Information satisfaction can be divided into multiple types, of which product information is the most critical aspect, followed by service information. Other factors, such as price sensitivity, are not taken into account within this last conclusion (C. Park & Kim, 2003). Information available in a channel needs to be relevant, up-to-date, credible, and well enough for consumers. Consumers usually find it easier to search online than offline, because the search effort and search costs are often lower. However, the perceived purchase risk is lower in an offline store as consumers can feel and test products in the physical channel. They also have the product in their possession directly after their purchase (Wang et al., 2016). As stated above, available information is important for multiple aspects. However, it is not always necessary to increase sales. For the online channel, the availability of information is not related to increased sales or perceived risk, but it is relevant for shoppers' purchase decision (Hwang et al., 2006; Park et al., 2005)

Good available product information can also have a negative effect: namely research shopping. This means that consumers search in one channel and buy the product in another channel. This effect is negative when customers search online but buy at the physical store, or for purely online players (Nunes & Cespedes, 2003). However this effect can be minimized when the online channel and the physical store are well integrated (Verhoef et al., 2007).

2.4.7 Opening hours and shopping effort

For shopping convenience, consumers usually prefer online channels, because they have longer opening hours and more retailers are directly available (Farag et al., 2007; Soopramanien et al., 2007). Shopping online is also a good solution when facing time pressure; shoppers in this group often have a positive approach towards e-shopping (Farag et al., 2007; Gupta et al., 2004) For pick-up points, lockers receive the highest score in terms of opening hours, because these locker are on their route during the day or because they are not at home during the expected delivery (Weltevreden, 2008). The combination of time-efficient ordering and the possibility to pick up an order any place, any time make opening hours and effort crucial for online shopping.

2.4.8 Available product range

By integration channel integration within the offline and online channel retailers can deliver more personalized information and a better product range (Oh et al., 2012). The width of the product range matters in multiple product categories; Williams et al. (1995) even claim that it is more important than familiar brands or helpful store personnel. Research has also examined the difference between niche product ranges and popular product ranges. Physical channels have an advantage when they have a popular product range instead of a niche one; their benefits are lower search costs and high visibility. Conversely, physical stores are not suitable for niche products because they require high search costs and good recommendations with large amounts of information, which is unlimitedly available online (Berman et al., 2004; Brynjolfsson et al., 2009). The local stores that sell popular products have an influence on the demand for internet stores that sell those products. In contrast, local stores have almost no influence on the demand for niche products. Therefore, physical stores are not considered competition for an online store with a niche product range (Brynjolfsson et al., 2009). Some consumers buy popular products online, and the motives for not visiting the store are usually convenience and time-efficiency. Niche products can also be sold in physical stores, but it must be clear for consumers where to find them. However, not only product assortment can influence the choice of a consumer. The retailer can for instance try to advise the consumer to

buy a certain product with the help of marketing, and recommend one product instead of the alternatives (Chopra, 2016; Simonson, 1999).

An earlier study concluded that a higher assortment size is evaluated more positively. However, this research only considered a single product category, which could make the findings doubtful.

2.4.9   Shopping failure or stock availability
Multiple criteria are important in the purchasing process, including product availability. Next to store image, product availability is also crucial for impulse shopping (Chen-Yu & Seock, 2002). When products are not available, this results in availability failure, and consumers go to a competitor's store or channel (Bendoly, 2005). In some situations, consumers also have to delay their purchase, which they do not consider positive. Whether the consumer buys the product at a competing store, in another channel, or delays the purchase depends on his or her loyalty to the retailer, the price, and the product uniqueness (Zinn & Liu, 2008). However, stockouts can also have a positive effect, by paying attention to service quality, personal attention, comfort, and other features. This contributes to overall customer satisfaction and can lead to product switching or purchase delay (Zinn & Liu, 2008). In sum, overall service quality can minimize the effects of shopping failure and stock availability.

2.4.10 Product quality and product criteria
For apparel, different attributes are important when shopping. Previous research has already concluded that four different criteria are relevant when selecting apparel: aesthetic, usefulness, performance, and quality. Most of the time, aesthetic is judged by style, color, fabric, appearance, and pattern. This criterion and corresponding influences are the most important in the purchase decision process when buying apparel. However, Eckman et al. (1990) divided the decision process into three phases: I Interest, II Trial, III Buy/Reject. In the first phase, mostly color/pattern, styling, and fabric matter. In the trial phase, fit and appearance will determine the purchase. The product's fit, styling, and appearance will also determine whether the product is rejected (Eckman et al., 1990) These criteria for buying clothes are in line with Hsu et al. (2002), who also found that fit, style, color, and quality are important when choosing products. However, they also found that price is significant in the purchase decision, even more so than quality (Chen-Yu et al., 2002; Hsu et al., 2002). The price of a product can be important in two ways: the level of the price and the value for money. Value for money is an important criterion for purchase decisions regarding multiple product categories (Williams et al., 1995). The expectation and preferred product quality also differ in product categories. Warehouse customers give more value to product quality than for instance grocery store shoppers, because hygiene and merchandise mix are more important for grocery products. However the importance of product quality compared to other criteria can also differ for each shopping motivation (Chen-Yu et al., 2002).

2.4.11 Attributes and criteria that influence consumers
As discussed in the previous paragraphs, multiple attributes and criteria have been found in the literature that influence consumers' preference when shopping. Four main factors affecting purchase preferences are considered: transaction service, merchandise, retailer personality, and price. Annex 1 summarizes all the different attributes and criteria. The groups in table X give a clear overview of the most important considerations that consumers make while shopping.

2.5   Channel integration within the purchase process

Channel integration can take place in multiple phases and can also influence consumers' choice behavior. The following paragraphs divide channel integration and certain influences into three phases: the pre-purchase phase, purchase phase, and aftersales phase.

2.5.1 Channel integration in the pre-purchase phase

Online and offline channel integration can become important in the pre-purchase stage. The consumer can go searching for product information and decide what the options are to buy a product online, at a store, or in a catalog. There are multiple options of online and offline channel integration in this phase.

First, consumers learn about what kind of product or article they need and what they need it for. In the pre-purchase phase, when consumers are orienting themselves, an integrated branding across all channels is important. This gives the consumer a familiar picture across all channels. For instance, logos, slogans, and colors need to be the same. This integrated branding strengthens the perceived association between the different channels. Integrated promotion gives consumers a clearer image of the retailer and its channels. Furthermore, making it clear that the online channel is integrated with the offline store is received positively by consumers and decreases risk perceptions. Visible channel integration with the online channel improves perceptions of service quality, which will lead to overall higher internet outcomes (Herhausen et al., 2015). When using the same promotion across multiple channels, it is important to use each channel in the best way. Every channel has its own advantages, whether it is the internet, a physical store, or a catalog. Berman et al. (2004) summarized various advantages per channel based on the differences between single-channel and multi-channel retailing. For instance, advantages of the internet channel are the 24/7 order capability, ability to easily compare offerings and products with each other, and unlimited space to describe a product. Ways to present a product range are different online, because of the unlimited space to use high-quality video, audio, images, and a personal customer interface. However, we can use our senses offline to see, feel, and smell products (Berman et al., 2004). As mentioned by Görsch (2002), joint promotion or cross promotion can also stimulate the use of different channels. An example is discount coupons for the offline store issued by the online store. In the same way, advertising one channel through another channel can encourage customers to use different channels, which will increase awareness. Good integration of promotion and relationships between channels can affect customer loyalty (Oh et al., 2012). In addition, Schramm-Klein et al. (2011) examined the effect on customer loyalty and found a positive impact of online and offline channel integration with several channels. Discount coupons or price discounts can attract customers and stimulate them to buy a product instantly (Eun Lee et al., 2014).

Joint promotions between the online and offline channels can encourage consumers with personal and social shopping motives. In their study, Oh et al. (2012) mentioned several methods to achieve joint promotions and channel awareness; they found positive effects on retailer performance when using retail channel integration. The implementation of IT in online and offline channels plays a large role in succeeding with a retail strategy. IT implementation is important for integrated transaction information management, but also for future, customized customer-based promotion. For instance, personalized web pages and personalized online newsletters can be developed. Integrated promotion can take place by advertising the name of the online store on flyers, receipts, carrying bags, or price tags on the shelves. The brand name, logo, website URL, and address can be used consistently on advertisements in newspapers or pamphlets. Furthermore, an online store locator with the addresses and contact information of physical stores can also be interpreted as a form of integrated promotion. Promoting the offline store in this way is important, as a high percentage of consumers first consult the online store (Neslin et al., 2006). In their study, Berman et al. (2004) even found that 25% of US consumers first shop online at the online store and subsequently visit the physical store. Stimulating this by giving financial incentives like coupons for each online purchase will attract direct customers to buy in the other channel. It will increase trust in other channels and strengthen the customers' perception of the association between channels

(Görsch, 2002). By giving more information about the possibilities to use multiple channels, it is possible that consumers will also use them later in the purchase process.

A CRM system[1] with channel integration can improve and stimulate the joint promotion and sales. Data on consumer preferences from the online channel can be used in the offline channel, for instance for personal advice. Conversely, the offline data can be used to stimulate online sales with personal offers in the online store and targeted e-mails with selected goods and personalized offers (Berman, 2004). In the pre-purchase phase, the consumer is searching for a specific product. Integrated product and pricing information gives the consumer in this phase a clear image of the product in both the online and the offline channel. An additional advantage of having the same product and pricing information online and offline is that it also reduces confusion from inconsistent information (Oh et al., 2012). However, implementing a CRM system in a retail organization is not an easy task. Possible issues are customer privacy, data quality, and reliability (Verhoef et al., 2010).

Furthermore, mobile devices are increasingly important in the pre-purchase phase. The new developments in digital channels, mobile channels, and social media have an immense impact on current retailing. The mobile channel is most relevant during the search phase, and shoppers now even frequently search for information about different offers or products in the store on their mobile device (Verhoef et al., 2015). Consumers do not only buy products in the online mobile channel, but also search for products there. Making searching for products in the mobile channel more accessible can deliver positive results for retailers. When consumers have found their product, they can buy it online in this channel and choose home delivery. In recent research, Wang et al. (2015) even found that consumers often use their mobile device to plan shopping trips and search for store opening hours. The product range in each channel can differ when no integration exists between channels. In contrast, with partial integration there is a partially shared product range. Full integration is also possible: then, the available products are the same in all channels. A fully integrated product range is superior to no integration but not to partial integration (Verhoef et al., 2015). However, it could be interesting to create a mix with more niche products in the online channel, since such a range in the online channel easily outperforms the same range in the offline channel (Brynjolfsson et al., 2009).

Verhoef, Neslin, and Vroomen (2007) concluded that "research shopping" is a growing phenomenon. Research shopping is searching for a product in one channel and buying it in another – for instance, searching for a product online and buying it offline in a competitor's store. This can be a disadvantage for retailers with a mobile channel: if the latter is very easy to use and accessible to find products and compare products, consumers also can use it to find out what they need and then buy it elsewhere. However, Berman et al. (2004) found that well-integrated product information in online and offline channels will improve overall store results, which can probably reduce research shopping. In their guide on how to implement online and offline channel integration, they analyzed multiple retailers with such integration, such as the large retailer Sears. Most consumers who purchased products at a Sears store had researched the online channel before buying the product at the physical store (Berman et al., 2004).

As stated earlier, a good online and offline channel integration is necessary and relevant for the research stage, but also to reduce the risk of switching to a competitive retailer. Bendoly et al. (2005) concluded that when consumers are faced with a lack of product availability, they can continue their search for the product at a competitor. Channel integration can reduce the risk of consumers leaving for competitors' stores. Providing integrated stock information can

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[1] Customer Relationship Management system

be a measure to reduce this risk. During the pre-purchase phase, when consumers can go online to check the product availability at the store, they can plan their visit and reduce the risk of availability failure. Overall, channel integration is complex, but some characteristics are necessary. Berman et al. (2004) observed common characteristics of online and offline channel integration, which general concern the harmony between the online and offline channels regarding various aspects, such as product consistency, pricing, and inventory data. This is in line with Neslin et al. (2006), who identified five common challenges for implementing customer management within online and offline channel integration: data integration, understanding customer behavior, channel evaluation, allocating resources across channels, and coordination channel synergies.

2.5.2 Channel integration in the purchase phase

In this stage, the consumer finishes the transaction of the good or service. This can take place online or offline, and is followed by receipt of the good or service. online and offline channel integration can also take place in this stage, and can be linked with the next stage. Purchasing online and picking up is a well-known form of online and offline channel integration in this stage (Görsch, 2002; Neslin et al., 2006). Furthermore, this integration can benefit consumers and retailers. Importantly, online and offline channel integration during the transaction can reduce channel availability failure, improve payment options, and increase incentives to complete the order (Bendoly, 2005).

It is important for consumers not to hesitate or cancel their order during the transaction phase if the product is not available in their channel of choice. This is true in each online and offline channel. Retailers with several locations and more channels have a lower risk of channel failure, as the consumer can choose a different channel instead of switching to another retailer (Bendoly, 2005). As described earlier, providing stock-out information during the search and decision phase can be a solution to reduce availability failure. In earlier research, an in-store kiosk was also found as a solution (Berman et al., 2004); instead, nowadays a self-service or assisted online terminal in this store can give the opportunity to order the product and receive it at one's home location or a preferred pick-up point. In earlier research, this solution to availability failures had a positive effect on store customers and also on the retailer performance (Herhausen et al., 2015). Online terminals can also offer more personal service when integrated with the CRM system's customer data. For purchases in an offline store, the costs are lower per sale. These lower costs are mostly general and administrative. This can be almost 30%, as concluded in a comparative study of Costco and Amazon (Chopra, 2016). Purchasing the product at a store or receiving it at a pick-up point also saves consumers shipping costs and handling fees. In addition, a benefit is that consumers can buy an extra product during their visit at the store. Berman et al. (2004) conducted a study in online and offline channel integration at Sears.com and found that 21% of Sears.com consumers bought other items during their shopping trip.

A self-service or assisted online terminal in the store also can be implemented with in-depth product information and shop floor plans. The American women's clothing store J. Jill has a successful integration, with an in-store concierge desk that supplies almost 8% of the in-store sales. At this concierge desk, it is possible for customers to order out-of-stock merchandise or special sizes (Berman et al. , 2004). J.C. Penney and Louis Vuitton have also provided self-service online terminals that reduce the negative effect of product unavailability (Herhausen et al., 2015).

In most retail stores, only simple self-service or assisted online terminals are available. However, grocery stores and supermarkets go a step further. Several grocery retailers in the US and Europe already provide self-service terminals in their stores. Consumers can finalize their transaction without the help of an employee. Overall, consumers want speed, control,

reliability, ease of use, and enjoyment when using self-service terminals (Orsingher et al., 2003). However, these terminals are not suitable for every customer when keeping in mind Tauber's (1975) shopping motives.

For good online and offline channel integration, it is important that the product, pricing, and customer data are shared with the online and offline channels. Big retailers are already comparing prices from competitors and continuously adjusting price displays. For instance, Amazon seems to adjust about 2.5 million prices a day. Some retailers even have the prices in their store on an adjustable digital display (Rijlaarsdam, 2014). Most of the time, cheaper prices or discounts lead to purchase intentions. However, Eun Lee et al. (2014) concluded that consumers can associate high discounts with perceived risks for certain product types.

It is possible to combine customer data with integrated promotions. When the transaction takes place in the physical or online store, the purchased item can be linked to the customer data. This provides more information on shopping preferences. Promotion or discount coupons distributed by e-mail or by post for in-store purchases need to be accepted and checked for authenticity. Integrating the transaction date can give retailers the opportunity to personalize ad based on customers' previously bought items (Berman et al., 2004). The optimization of standard marketing and advertising to personalized ads and marketing can reduce advertising costs, and the retail marketer can take advantage of the consumer's information during the transaction phase (Schoenbachler & Gordon, 2002). In addition, retailers can use transaction information to collect data about channel usage and to find out about the consumer's channel preferences and choices (Gensler et al., 2012). This data can give the retailer the opportunity to improve its strategy. Apple is an example of a company with shared transaction data for ads or personized shopping. Apple improved its physical stores for customers to experience the product; it has created highly performing stores by reinventing them entirely. The physical Apple store is fully integrated with the online store, and purchase and sales information is combined and linked to the customer data. This makes it possible to log in, buy accessories compatible with one's device, ask for support, and make an appointment for service in all available channels (Morse, 2011).

Channel integration in the purchase phase can vary from ordering a product online and picking it up at the store, to ordering it at the store and choosing home delivery. The ways to integrate in the product receipt phase have multiple effects on customer loyalty, perceived quality, and customer trust. Consumers who shop at retailers with channel integration usually spend more compared to those at single-channel retailers. There could be multiple reasons for this (Accenture, 2010), but Neslin et al. (2006) found that consumers who shop at retailers with online and offline channel integration received more marketing and acted more strongly on the type of marketing they received. Besides marketing, the possibility to pick up an order at a physical store can also increase sales (Berman et al., 2004). The easiest and fastest way to search for, select, and order a product is by using the online channel. However, the disadvantage is missing human contact and experiencing products physically (Grewal et al., 2004); this can be tackled by using a physical channel (Chatterjee, 2010). Using a physical channel to pick up products ordered online can also save shipping and handling costs. An example is ordering a product online with a credit card for a store pick-up and payment 72 hours later; if the order is still not collected after 72 hours, the transaction is cancelled and the item is returned to the stock (Berman et al. , 2004). Another option is providing online inventory information so consumers can check product availability and easily prevent wasted shop visits if products are sold out (Oh et al., 2012). Impulse shopping can lead to unplanned purchases and these unplanned purchases are also usually larger. Using pick-up points for online channel orders can increase impulse shopping (Chatterjee, 2010); this finding is in line with the research of Byalogorsky et al. (2003). Berman et al. (2004) conducted case studies and found that 30 to 40% of online sales were picked up at the brick-and-mortar store. In addition, the

customers who came to the stores also bought other items on their trip. Multiple channels for consumers to pick-up items can lead to customer satisfaction, loyalty, and firm value. Consumers who choose in-store pick-up points are often price-conscious or have a short purchase horizon, needing products soon. The logic for these groups is saving shipping and handling costs for price-conscious consumers and saving time for consumers with a short purchase horizon (Chatterjee, 2010). Retailer benefits for order pick-up at a physical store are the possibilities to reduce their inventory and location costs (Chopra, 2016). Morganti et al. (2014) even found that pick-up points are already a well-established alternative to home delivery in France. Benefits for this type of product delivery are reducing missed deliveries or minimizing inefficient delivery routes. An additional advantage of pick-up points is that they can make shops and shopping centers more attractive: people will go to pick-up points and can stop by at the nearest shop to buy additional items in the neighborhood (Weltevreden, 2008).

Channel integration with the possibility for consumers to pick up their online order at a physical store location also gives the retailer benefits in terms of integrated promotions. Transaction information and personal data can be integrated to optimally meet the consumer's shopping needs. Easy integrated promotions for store pick-up are personalized ads on the receipt, and store personnel who can suggest suitable products based on a personal profile (Berman et al., 2004). A personal discount code on a receipt is also a form of integrated promotion; consumers can obtain an extra discount when using their physical store receipt in the online channel (Bendoly, 2005).

2.5.3   Channel integration in the after sales phase
Product use, service needs, and aftersales in case of a faulty or defective product arise in the aftersales phase. In this stage, online and offline channel integration can play a role for the consumer and retailer. Consumers can use touchpoints and several channels to contact the retailer if they have problems with their purchased products or services.

Aftersales and returned products are important and can increase costs for several stakeholders, but also benefit and influence customer retention. The costs of returned products that are damaged or partially used can vary. Previous studies have estimated these costs at 10% to 20% of the original value of the returned product (Stock et al. 2006). Combined with the higher total number of returns for online and catalog sales, these costs can have a significant impact on a retailer's total performance. The returns of catalog and online sales are higher than at a physical store, and can vary from 18% to 35% depending on the product category. The return rate can also differ between product categories. Returned products contribute to an increase in costs not only for retailers, but also for consumers. For instance, returning a product by mail to the online channel can lead to extra costs (Ofek et al., 2011). More costs can be a barrier for a consumer to order. On the other hand, when it is possible to return products at a physical store, the costs for consumers can be lower.

Store personnel must be able to recognize an online purchase and should be able to arrange a return or exchange (Berman et al., 2004). This manner of aftersales not only makes a consumer aware of the possibility to switch between channels, but also creates an experience with what the retailer offers as a whole. The ability to return purchased products provides added value for a consumer; how high this added value is depends on the product category purchase (Anderson et al. , 2009). In previous research, Mollenkopf et al. (2007) studied the possibility of returning products and the effect on customer loyalty intentions. They found that excellent service led to increased customer value and satisfaction, which could in turn lead to a good consumer-retailer relationship. On the other hand, poor service can lower a customer's loyalty to a retailer. Integrating the physical channel with the online channel can increase returns and exchange, but it has no effect on the sales in the online channel. Overall, it also delivers a net increase in purchase frequency and revenue (Verhoef et al., 2015).

Aftersales support for products with integrated customer service can be done with the help of various channels, such as a store terminal, store employees, or the mobile channel. In the online channel, it is possible to use self-service, e-mail service, live-chat service, or check the telephone number to call the retailer (Berman et al., 2004). When support is needed, online after-sales for products bought at the physical store can be an option. In addition, real-time chat sessions can give consumers access to service assistance (Oh et al., 2012). Good support and aftersales are consumers' final desire after the purchase of a product, and can lead to overall customer extension and retention (Görsch, 2002). Furthermore, previous channel experience can also affect a consumer's preference for a channel when making use of after-sales or support (Gensler et al., 2012).

Customer support with good and fast responses, for instance in an online chat service, has a strong influence on customers' perception of the value of the return policy, which increases their loyalty intentions (Mollenkopf et al., 2007). Nowadays, average technology-savvy consumers also expect to be served whenever and wherever they want (Oh et al., 2012). Consumers are affected by channel choice when convenience is visible. In other words, when it is visible that purchasing is easier online, they will probably choose that channel. This effect usually occurs in the purchase or after-sales phase (Gensler et al., 2012). Overall optimization of integrated channels can also influence their use. Good integration can offer more convenience to a consumer. Gensler et al. (2012) complemented Neslin et al.'s (2006) work with their finding of a functional channel strategy. This functional channel strategy had the following steps: consumers search online for their needs, buy the product at the store, and use the call center or live-chat for aftersales support.

Next to returning products, repairing and warranty issues can also be handled in all channels. It seems obvious that for most retailers, the physical channel would be preferred for handling repair and warranty issues. When such an issue is reported, personnel should be able to check if any repair appointments are scheduled. The usage of a well-integrated CRM system can provide staff with information about the warranty status of products bought in the online or offline channel (Berman et al., 2004; Görsch, 2002). Clear communication throughout the process is important. For clear communication, highly trained personnel who can analyze defective products and perform diagnostics should process return requests (Stock et al., 2006). Integrated customer service for a consumer to return a product bought online for repair in a physical channel can lead to better retail performance. Oh et al. (2012) found that the use of IT and integrated customer service possibilities had a significant positive effect on retail performance. These findings are in line with an earlier study by Görsch (2002), who developed a list of considerations for multi-channel design with the help of customer behavior theory. Usually, the phase of repairing returned products and warranty issues will lead to increased costs for the retailer. However, it is possible to improve and transform this phase to make it profitable by repairing products or making use of a buyer for old, defective products (Stock et al., 2006).

2.6 Channel integration in practice

In practice, retailers already use channel integration to optimize their strategy against competitors; some retailers are far ahead on their competitors. Previous research has identified the characteristics for success and pitfalls. This section further addresses the experiences of online and offline channel integration in retail.

Some people see physical channels disappearing and online channels growing, but the opposite is in fact happening, and both channels are simply becoming more integrated. Nowadays, physical channels do more than simply completing transactions. They need to

deliver more added value and it is important to shift from "how do we sell more?" to "how can we create added value for the customer?". With this attitude in mind, Senior VP Ron Johnson reinvented the Apple stores (Morse, 2011).

The American electronic retailer Best Buy is an example of a company that has integrated online and offline channels. However, opportunities for consumers to pick up their online order at the store, integrating customer service, and other integration have not yet yielded the planned results. European reseller Media-Saturn and other retailers have also struggled to create a directly successful integrated retail strategy (Accenture, 2010).

2.6.1 Characteristics of successful online and offline channel integration

The organization and processes need to be integrated overall; siloed structures need to be transformed into integrated structures. For example, Otto Group minimized channel conflicts and integrated and reformed their marketing, format, and category management functions for all channels (Accenture, 2010). Integrated CRM is important to contact consumers in the same way in every channel. Shopkick is an IT retailer that has introduced integrated bonus schemes for consumers across retail channels (Accenture, 2010). Another retailer whose promotions are visible and usable across all channels is J. Jill; this has resulted in higher customer retention and reliability for the company (Berman et al., 2004). Well-integrated CRM systems will generate added value for a firm when switching between channels is necessary as result of changing demand. The Dutch catalog firm Wehkamp.nl changed its main channel from a catalog to an online store, which is only possible with a multi-channel CRM. Furthermore, the retailer Tesco implements and uses successfully integrated customer data across all channels (Verhoef et al., 2010).

Other integrated options, like store pick-up, have already proven themselves. For instance, the retailer Sears noticed a sales increase of 21% for each consumer who picked up an online order at the store: in the same shopping trip, these consumers bought other items (Berman et al., 2004). In contrast, it still remains a challenge to immediately find the online order when a customer claims it for store pick-up (Verhoef et al., 2010).

Previous research has already shown the important issues when changing to an online and offline channel integration (Berman & Thelen, 2004). In addition, Accenture (2010) introduced five factors for future retail success.

2.6.2 Pitfalls of online and offline channel integration

Full channel integration also has pitfalls. For instance, making the product range consistent across all channels online or offline can result in surplus stock. Macys.com offers a different product range offline than online. The online product range is larger because surplus stock is not possible for the physical channel (Berman et al., 2004).

Consistency across channels is crucial because it will deliver a seamless experience for the consumer when using different channels. The company J. Crew lacked overall branding consistency across several channels; this resulted in different prices and could have angered and alienated customers as a result (Berman et al., 2004).

Pitfalls can arise not only from the way integration between channels is arranged, but also from the distribution and transport between channels, or to consumers. Toys 'R' Us, for instance, failed to deliver online orders to consumers on time for Christmas in 1998. After this failure, it started a collaboration for fulfillment with Amazon, as did Office Depot (Berman et al., 2004).

Not really a pitfall, but an additional effect of channel integration is consumers who become multi-channel consumers. These consumers can choose the online channel as the information

source because of its easy access and research possibilities; then, after they have found their required product, they can select their channel of choice. Searching for a product in one channel and buying it in another is also referred to as research shopping (Verhoef et al., 2007)..

Many purchases in the brick-and-mortar store happen without the exchange of personal information. Recent research into channel integration also concluded that 48% of 50 retailers had learned nothing, because no good integrated systems were available to identify consumers (Verhoef et al., 2007). However, implementing a good CRM system to measure and use integrated technologies can be a large investment and a high threshold to use online and offline channel integration (Verhoef et al., 2015). Customer data is also important when offering product pick-up in store. Without customer data, recognizing a customer's online order in the offline store remains a challenge (Verhoef et al., 2010).

Neslin et al. (2006) found five key challenges for customer management when implementing channel integration: data integration, understanding customer behavior, channel evaluation, allocating resources across channels, and coordinating channel strategies. Retailers need to notice and pay attention to these challenges

Table 4 Options for online and offline channel integration

	(Keen et al., 2004)	(Levin et al., 2003)	(Görsch, 2002)	(Zhang, 2008)	(Grewal & Baker, 1998)	(Gehrt et al., 2004)	(Oh et al., 2012)	(Berman et al., 2004)	(Brynjolfsson et al., 2009)	(Bendoly, 2005)	(Beck et al., 2015)	(Weltevreden, 2008)	(Verhoef et al. 2015)	(Herhausen et al., 2015)	(Chatterjee, 2010)	(Chopra, 2016)	(Morganti et al. 2014)	(Neslin et al., 2006)
Multiple pick-up possibilities				x	x		x	x				x	x	x	x	x	x	
Multiple purchase channel possibilities	x		x	x	x	x	x	x	x	x		x	x	x	x	x		x
Integrated Stock information among all channels			x	x		x		x		x				x	x			
Aftersales/return options at all channels		x	x	x	x		x	x		x				x	x			x
Integrated customer data shared with other channels			x				x	x						x				
Integrated promotion with personalized ads							x	x			x							x

2.6.3   Attributes and criteria for online and offline integration
Multiple options are available for online and offline channel integration; Table 4 (below) summarizes the popular ones. Multiple studies have examined the influence of online and offline channel integration. Of the five options, four options are implemented the most often, and are considered the most interesting to use in this study.

2.7   Conclusion

Before presenting the data collection and quantitative research, it is important to answer the first two sub-questions: *"What is online and offline channel integration and what types can be distinguished?"* and *"What options to implement online and offline channel integration exist for a retailer?"* This chapter has provided a clear image to answer these questions. In addition, to

answer the main question, the importance of other criteria in the consumer purchase behavior literature is also summarized.

Previous research on consumers' preferences and purchase behavior has not always emphasized or considered the importance of online and offline channel integration. Moreover, when this integration is part of the research, no distinction is made between added value and consumers' wiliness to pay. Levin et al. (2003), Muthitacharoen et al. (2006), Keen et al. (2004), and Zhang (2008) have all examined customers' purchasing behavior and preferences. In some situations, the research also dates back 10 years, and the current shopping environment has changed significantly in the last decade. An example of this changing environment is the increase in online shopping (Chopra, 2016).

When dividing the process of shopping into phases, the definitions differ among multiple studies. However, by merging all theories, the process of shopping contains the pre-purchase phase, purchase phase, and after-sales phases. In the initial pre-purchase phase, motives for shopping play a large role. Before and during the purchase phase, consumers have underlying motives to go shopping; these can be divided into personal and social motives, as described by Tauber (1975). By cross-comparing these social and personal motives with Dawson et al.'s (1990) theory, the motives are divided into product-oriented shopping, experiential shopping, or both. In addition, psychographics also influence shopping preferences; these are summarized by Konuş et al. (2008).

In the pre-purchase phase, multiple consumers define their purchase decision based on criteria and attributes that differ between products and retailers. Key criteria that consumers match to their choice are for instance product price, product brand, product quality, and product range available in the store. Consumers attribute value to these criteria for multiple reasons. Section 0 presented multiple criteria that can have an effect on consumers' purchase decision. The literature provides the following list of consumers' most important preferences:
- Price range;
- Product range / assortment width;
- Product quality range;
- Product brand / image;
- Guaranteed stock; and
- Available product information.

Determining the importance of online and offline channel integration during the consumer decision process requires an inventory of the types of integration. Section 2.5 divided the types of online and offline channel integration according to three main shopping phases: the pre-purchase, purchase, and aftersales phases. The most common types of online and offline channel integration discussed in section 2.5 are integrated branding within all channels, integrated promotion within all channels, integrated CRM systems with all customer and order data, integrated product information within all channels, integrated stock information within all channels, integrated pick-up options for orders, integrated return options within all channels, and integrated aftersales customer service within all channels. For these types of integration an integrated CRM system and a good internal structure are usually necessary to succeed. Previous experience also indicates the importance of integrated organization and processes for success. Otherwise, pitfalls can for instance be the lack of integrated branding and overall consistency across the channels. This is important for a seamless customer experience. The most critical criteria and attributes are:
- Channel to buy the product;
- Pick-up channel to receive the product;
- Guaranteed stock information on the product/item;

- Return options for exchange or refund;
- Price range of the retailer;
- Product range/assortment width of the retailer;
- Quality of the products available at the retailer.

3 Research design

This chapter describes this study's required data, necessary methods for data collection, and the analysis and model estimation methods. First, the following sections specify the research goals and sub-questions before presenting the necessary method for data collection. Subsequently, the method for the statistical analysis and model estimation is explained. Finally, this chapter ends with the design of the questionnaire.

3.1 Research goals

Before explaining the methods for data collection and statistical analysis, it is necessary to consider the research objective and research questions. The research objective in this study is to *gain insight into the added value of online and offline channel integration for consumers and to determine its effect on their choice behavior while shopping with online and offline channel integration.* The previous chapter substantiated the definition of online and offline channel integration and its importance. It also clarified consumers' preferences during the purchase process and the options for channel integration. The following sections explain the method for data collection and analysis. This contributes to answering the research question: "*What is the added value of online and offline channel integration and to what extent does the presence of channel integration influence the choice behavior of consumers when choosing between retailers?*"

3.2 Method and data

Multiple theories and methods are used in research to measure or analyze choice behavior. In this study, stated choice is a useful method to determine the added value of online and offline channel integration for consumers compared to other shopping preferences. With stated choice, hypothetical choice sets are presented to the respondent. For each choice set, the respondent needs to select their preferred alternative, which are designed with attributes. The respondents' preference for the hypothetical alternatives is measured. This method has proven very valuable in reducing the mutual correlation between the attributes of these alternatives. Another major benefit of this method is its ability to test responses to a combination of different attributes, which are not possible or difficult to observe in a real-world situation (Hensher, 1994). Furthermore, the stated choice method is very valuable for measuring willingness to pay (Hensher, 2004; Sanko, 2001).

3.2.1 Stated choice method
In choice behavior research, a distinction is made between revealed preference methods (RP) and stated preference methods (SP). The difference between RP and SP is that revealed preference is executed in real market situations; it can consist of observing individuals' behavior when making purchase decisions. The difference in data compared to SP can be that one or more attributes of choice are missing at the time of purchase, when the data is collected. RP is also more time consuming as multiple observations are required for each respondent. In addition to the time-saving aspect, the total control of the SP experiment is higher, because relations between attributes can be controlled by the researcher (Adamowicz et al., 1998; Louviere et al., 2000; Train, 2003).

For SP a decomposition SP method (conjoint analysis) or compositional SP method can be used. This method asks direct questions about attributes without taking into account other attributes. Especially to test new products or services that are not yet available, the compositional SP method is not suitable. Decomposition SP uses multiple choice tasks with more than one attribute. These attributes can vary in levels; for example, "price" can be low, medium, or high. The multiple attributes with varying levels are constructed into alternatives. Figure 3 visualizes the

Figure 3 Example of choice set with two alternatives (Sanko, 2011)

presentation of a choice task is visualized with two alternatives containing the attributes and levels (Nijënstein, 2011; Sanko, 2001; Train, 2003). In summary, the advantages of using stated choice are:

- Little to zero-correlation possible and full control of the attributes by the researcher.
- Time efficient compared to the amount of data that can be collected.
- Useful to test non-existing situations in behavioral decision-making.

Of all the methods in choice analysis, this study used the stated choice method to determine the added value of online and offline channel integration options and the effect on choice behavior. Stated choice gives the opportunity to test new attributes that are not yet applied in real market situations. It consists of presenting different choice sets with choice profiles that contain multiple attributes and varying levels. The respondents can choose their preferred choice profile out of the choice set. Each profile with attributes is developed orthogonally, which prevents correlation between profiles (Adamowicz et al., 1998; Kemperman, 2014b).

3.2.2   Methods for data collection

This empirical study on the added value of online and offline channel integration requires a data collection with multiple variables. The used database for the questionnaire contains consumers from an online retailer that sells lingerie, hosiery, and slippers. The questionnaire was spread by e-mail and to customer base of an online e-commerce retailer. Tis database contains thousands of consumers, which was positive for the response of the survey. The invitation e-mail sent to the potential respondents contained some personal background information, and some information about the questionnaire and research goals. Figure 4 shows the sequence of the data collection. First, the socio-demographic characteristics and shopping psychographic characteristics were collected. The second part of the data collection contained the choice sets from the stated choice method. The socio-demographic characteristics provide information about the respondents; these variables are: age, gender, work, education, place of residence, and household situation. Next, the shopping psychographic characteristics gathered information about the consumers' shopping motives, shopping orientation and shopping preferences. To develop the choice tasks and the attributes, Adamowicz et al.'s (1998) stated choice method guidelines were used. If the choice tasks are too complicated, the respondent cannot imagine the situation, which can result in
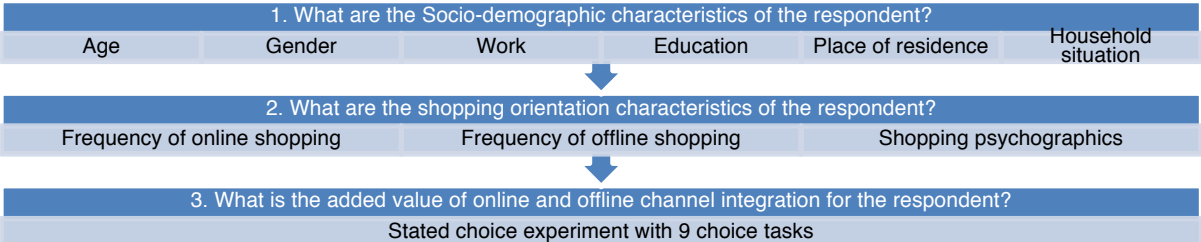
Figure 4 Sequence of the data collection

unreliable data. To avoid this, the respondents were asked to choose between two choice profiles. To reduce the complexity, the maximum number of attributes for each choice profile was eight, and the start of the choice tasks began with an introduction and an example choice task (Adamowicz et al., 1998; Carson et al., 1994).

3.3 Methods for data analysis

To answer the research (sub-) questions, this study used a descriptive analysis of the socio-demographics and psychographics, followed by the statistical model necessary to answer the last research questions.

Descriptive statistics were collected regarding the respondents' socio-demographic and psychographic characteristics. These statistics could help in the latent class model and provide some information about the sample used for the stated choice method.
A latent class model was used to analyze and calculate the preferred channel integration attributes and the overall added value compared to other attributes. Furthermore, with this model, it is possible to find similar groups or classes with the same preferences. Using this model, the research questions 3 and 4 can be answered.

3.3.1 Descriptive statistics
The first part of the data analysis describes the respondents' socio-demographic and psychographic characteristics, which are important. The attitudes and preferences of individuals can differ, which highlights the significance of these characteristics (Keng Kau et al. , 2003). Earlier research on retail included the socio-demographics of shoppers in The Netherlands; the most commonly used characteristics in these studies were age, level of education, income, residence, and household size (Verhoef et al., 2007). To determine which socio-demographics were necessary in the present study, the layout and terms from Statistics Netherlands (CBS) and earlier research on consumer preferences were used (Bendoly, 2005; CBS, 2018; Chatterjee, 2010; Lemon & Verhoef, 2016). Based on this, the following socio-demographics were collected: age, gender, work, education, place of residence, and household situation. This information made it possible to create segments and groups based on age or level of education. For instance, consumers in small residences can have different channel integration preferences than those in to large residences (Chatterjee, 2010).

The psychographics are part of the shopping-oriented characteristics; they are important in customer segmentation and for retail strategies. The interesting thing about psychographics is that they give us the opportunity to understand why purchase decisions are made (Wells, 1975). In this study the psychographics are the variables that can influence the consumers in their purchase decisions. These variables are further explained in Section 3.4.

3.3.2 Latent class model
To determine the effect of online and offline channel integration on the preferences of consumers for shopping at a certain retailer, a latent class model was used. This model makes it is possible to find groups and classes with the similar preferences and interests; different classes are formed and used. Each class consists of consumers with different shopping preferences regarding online and offline channel integration. However, socio-demographic and psychographic characteristics differ between the members of these classes (Louviere et al., 2000). The first steps of the latent class model are based on the multinomial logit model. Heterogeneity in individuals' decision-making and choice behavior is difficult to prevent or minimize and is not always visible during data collection. With the multinomial logit model, it is possible to determine which retail characteristic is most preferred by the consumer. The respondents evaluate and value each attribute and level, before selecting their preferred choice profile (alternative). The most selected alternative represents the highest overall utility. The multinomial logit model also makes it is possible to estimate the utility of each attribute

that is used in the choice tasks. The attribute and choice profile (alternative) with the highest utility has the highest chance of being chosen. Within stated choice, this utility is not directly measured; it can be calculated with the multinomial logit model. The attributes from the choice tasks contain the online and offline channel integration options and shop characteristics, such as price (Hensher et al., 2015). In the equation to calculate the total utility of alternative *i* for individual *q,* a random utility component is added. This is done to reduce possible biases (Train, 2003). To calculate the utility the following equation can be used:

$$U_{iq} = V_{iq} + \varepsilon_{iq} = \Sigma_n \beta_n X_{inq} + \varepsilon_{iq}$$

U_{iq} = Utility of alternative *i* for individual *q*
V_{iq} = Structural utility of alternative *i* for individual *q*
ε_{iq} = Random utility
β_n = Parameter representing (generic) weight of attribute *n*
X_{inq} = Score of alternative *i* on attribute *n* for individual *q*

The latent class model is used to form groups or so-called classes. The individuals are linked to the class with the highest probability. It is likely that not all individuals will have the same socio-demographic background, but the preferred characteristics for the alternatives will be the same for the individuals in these groups or so-called classes (Adamowicz et al., 1998; Train, 2003).

To estimate the latent class model in this study, the software NLOGIT5 is used. It is possible to estimate multiple classes with the consumers who have the same shopping preferences. Multiple measurement tools can be used to determine which latent class model is the most suitable. For instance, the most suitable latent class model can contain two, three, or even four different classes. To determine the best fit for the latent class model, the Akaike Information Criterion (AIC) is used. The AIC identifies the most suitable model with the highest probability of being the true model. The AIC equation is:

$$AIC = -2LL(\beta) - K/N$$

$LL(\beta)$ = Log likelihood function at estimated parameters
K = Number of parameters in the model

Within the latent class model, this probability is derived from the class assignment model (Greene et al., 2002; Hensher et al., 2015).

The multinomial logit model is a good method as a starting point to calculate the probability that an alternative *i* will be chosen. When the utility of each alternative is calculated, it is possible to find the probability that the respondent will choose a certain alternative.

The probability that an individual will choose alternative *i* from the set of *J* alternatives is calculated with the following equation:

$$P_i = \frac{exp(V_i)}{\sum_j exp(V_j)}$$

P_i = Probability that alternative *i* will be chosen
V_i = Structural utility of alternative *i*

It is necessary to know whether the model is reliable and shows valid results. To determine the validity, the goodness of fit is often calculated and used for discrete choice models (Train, 2003). Statistic measures like goodness of fit will test how well the model performs with the estimated parameters compared to no model at all. After estimating the model, McFadden Rho-square can be determined; this value presents information about the quality of the model. The minimum outcome for the McFadden's Rho-square is 0 and the highest is 1; it depends of the quality of the statistical model. For instance, an out outcome of 0.2 can be considered as usable and represents a decent model (Louviere et al., 2000; Train, 2003). The goodness-of-fit can be calculated with the help of the equation below:

$$\rho^2 = 1 - \frac{LL(\beta)}{LL(0)}$$

$LL(\beta)$ = Log-likelihood using estimated parameters
$LL(0)$ = Log-likelihood using the null-model with all parameters β equal to 0.0
ρ^2 = Goodness-of-fit: McFadden's Rho-square

The log-likelihood **LL(ß)** of all the respondents can be calculated. The higher the log-likelihood, the better the goodness of fit and the higher McFadden's Rho-square. When taking the numbers of parameters into account, McFadden's Rho-square adjusted needs to be calculated. It is possible to use the Rho-square adjusted with the following equation:

$$\rho^2_{adj} = 1 - \frac{LL(\beta) - K}{LL(0)}$$

$LL(\beta)$ = Log-likelihood using estimated parameters
$LL(0)$ = Log-likelihood using null-model with all parameters β equal to 0.0
K = Number of estimated parameters
ρ^2_{adj} = Adjusted goodness of fit: McFadden's Rho-square

3.4 Operationalization of the variables

In the first part of the data collection, the socio-demographic variables provide information about the structure of the research sample. The design for the stated choice experiment is developed with multiple steps to define and compose the choice sets, attributes, levels and orthogonal design.

3.4.1 Operationalization of socio-demographic variables

The socio-demographic and psychographic characteristics give information about individuals and the structure of the sample used in this research. With socio-demographic information, it is possible to compare the collected data to the population of the Netherlands or a specific target group. The collected socio-demographic variables are age, gender, work, education, place of residence, and household situation. The operationalization of all socio-demographic variables is presented in Table 5.

Table 5 Operationalization of all socio-demographic variables

Socio-demographic variable	Level of measurement	Category
Age	Ratio	*Open question*
Gender	Nominal	Man Woman
Education	Ordinal	Primary education V(m)bo, lts, lbo, Domestic school Mavo, (m)ulo Mbo, mts Havo, vwo, hbs Hbo, pabo, hts, heao Wo (master, PhD, post-graduate)
Place of residence (postcode)	Nominal	*Open question*
Household situation	Nominal	One person household Couple without child(ren) Couple with child(ren) Single parent with children Multi-person household without child(ren) Other:…………………………

3.4.2 Shopping-oriented characteristics

In addition to the socio-demographic characteristics, data on shopping-oriented characteristics were also collected. This served to gather information about consumers' shopping motives, shopping orientation, and shopping preferences. Agree/disagree statements were used on a scale to obtain this information. The used statements were based on the psychographic variables proposed by Konuş et al. (2008), and supplemented with earlier research by Shim et al. (1994) and Kotsiopulos (1993). The different agree/disagree statements were based on the following psychographics: creativity/innovativeness, brand or product loyalty, motivation to conform / self-improvement, shopping enjoyment, time pressure and economic/price consciousness. Table 6 presents the variables and their corresponding level of measurement.

Table 6 Operationalization of shopping frequency variables

Question	Level of measurement	Category
I go shopping at an online shop for clothes or fashion every?	Ordinal	Never Less than once a year Between 1 or 3 times each year 1 or 2 times each quarter 1 or 2 times each month 1 time each week More than 1 time each week
I go shopping in the physical store for clothes or fashion every?	Ordinal	Never Less than once a year Between 1 or 3 times each year 1 or 2 times each quarter 1 or 2 times each month 1 time each week More than 1 time each week

Following the questions about the online and offline buying behavior the, shopping-oriented characteristics were collected using multiple agree/disagree statements.

Table 7 Operationalization of agree/disagree statements

Statement		Level of measurement	Disagree			Agree	
Creative/innovativeness	I regularly purchase clothing from the new collection or different brands just for a change.	Ordinal	1	2	3	4	5
	I am one of those people who always buys new clothing after the launch of the new collection.	Ordinal	1	2	3	4	5
	I find it boring to always wear the same the same clothing (or brand) repetitively.	Ordinal	1	2	3	4	5
	I like to try new and different items.	Ordinal	1	2	3	4	5
	I always have the newest fashion trends.	Ordinal	1	2	3	4	5
Loyalty / brand conscious	I generally do my shopping in the same way.	Ordinal	1	2	3	4	5
	The clothing brand is important for me in my purchase decision.	Ordinal	1	2	3	4	5
	I generally purchase the same brands.	Ordinal	1	2	3	4	5
	The place where I do my shopping is very important to me.	Ordinal	1	2	3	4	5
Motivation to conform/ Self-improvement	Wearing designer clothing gives me social status.	Ordinal	1	2	3	4	5
	The clothes that I wear identify my role.	Ordinal	1	2	3	4	5
	My self-esteem is enhanced by the clothing I wear.	Ordinal	1	2	3	4	5
Shopping enjoyment	I like shopping.	Ordinal	1	2	3	4	5
	I take my time when I shop.	Ordinal	1	2	3	4	5
Time pressure	I am always busy.	Ordinal	1	2	3	4	5
	I usually find myself pressed for time.	Ordinal	1	2	3	4	5
Economic / price consciousness	It is important for me to have the best price for clothing.	Ordinal	1	2	3	4	5
	I compare the prices of various clothing stores before I make a choice.	Ordinal	1	2	3	4	5

3.4.3 Operationalization of stated choice variables

Before operationalizing the variables used in the stated choice method, it is first necessary to summarize the steps taken to develop this stated choice experiment. Hensher's (1994) method was used to develop the choice tasks; it consists of the following steps:

Step 1: Identification of the set of attributes.
Step 2: Selecting the measurement unit (levels) and magnitude for each attribute.
Step 3: Experimental design.
Step 4: Questionnaire development.
Step 5: Estimation procedure
Step 6: Model estimation to obtain choice probabilities for each alternative.

The last two steps of Hensher's (1994) approach are the estimation procedure and the model estimation. These last steps are presented in Chapters 4 and 5.

Step 1: Identification of the set of attributes.
The stated choice experiment consisted of different, varying choice tasks created by an orthogonal design. Each choice task had two choice alternatives, and these profiles consisted of attributes with varying levels. The first step was the identification of the attributes used for the choice tasks. Concerning the attributes for the stated choice experiment, a distinction was made between the most important online and offline channel integration options (Section 2.5) and criteria that influence the purchase decision process (Section 0). In this step, it was important to reduce or eliminate main effects and interaction effects between attributes.

The first attribute used in the stated choice experiment was the ***channel to buy and receive the product (section 2.5).*** Consumers usually use a physical or online channel as their preferred purchase channel to buy a product (Rigby, 2011; Verhoef et al., 2007). In recent research by Morganti et al. (2014), pick-up points for online shopping were found to be a well-established alternative for home delivery. In the present study's stated choice method, this option was also tested in combination with online shopping. The combination of three levels was made to create the most suitable attribute levels to present in the experiment, without the risk of main-effects and interaction effects between attributes.

To test whether ***product availability (section 2.5)*** is important in purchase decisions, a distinction was made between available or non-available situations. Availability failures give consumers the opportunity to go shopping elsewhere and can lead to dissatisfaction and other negative effects, as explained in the previous chapters. In the pre-purchase phase, these availability failures can be prevented by making product availability visible to the consumer (Bendoly, 2005).

In the aftersales phase, the possibility to return an item can be important for the consumers and for the retailer. When a customer is forced to return a product by mail, it can be a barrier for the consumer to place an order (Stock et al., 2006). To test the willingness to pay for returning options, the attribute: ***returning product (section 2.5)*** was added to the stated choice experiment. Attribute levels varies from a free return option at a pick-up point to an extra fee of €3.50. The attribute levels are presented in Table 8.

The ***product price (section 0)*** was also added to the stated choice experiment, because it can make a consumer choose a certain retailer. As found in the literature, the price of a product can be one of the most important attributes for decision-making in the pre-purchase phase (Shim et al., 1994). Therefore, it is crucial to test price characteristics in comparison with the other attributes.

The ease of shopping between ***product range (section 0)*** differs greatly between physical and online retailers. The search costs and effort to find niche products are higher in a physical store than online. As stated earlier, a niche product range in an online channel easily outperforms a niche product range in the physical channel. Product range was implemented in this research to test the demand in comparison to the other attributes.

The available ***product information (section 2.5)*** is critical and along with service information, it influences the consumer's purchase decision. Information about products can be visualized in multiple ways and through multiple channels. To test which channels are most preferred, this attribute was added to the stated choice experiment.

Customer loyalty and retention are crucial and will increase results. A CRM system can contain information on consumers' preferences, and sizes, and gives the opportunity to recommend products based on available ***purchase history (section 2.5).***

Step 2: Selecting the measurement unit (levels) and magnitude for each attribute.
The level of measurement depends on the attribute; for instance, price can be used multiple ways. However, in practice it is important to reduce the complexity of the experiment and therefore an ordinal scale is often suitable when a ratio is also possible (Hensher, 1994). Table 8 shows the attributes and corresponding levels.

Table 8 Attributes and corresponding levels for the stated choice experiment

Attribute	Level
Channel to buy and receive product	• Online store + home delivery • Online store + pick up point • Physical store + Physical store pick up
Product availability	• Unknown • Available, Stock information available. • Available, No stock information.
Returning product	• Return at pick-up point for free • Return at pick-up point for €3.50 • Arrange return shipment yourself at own costs
Product price	• 5% more expensive than average • 5% cheaper than average • Price the same as average
Product range consists of	• Popular assortment • Niche assortment
Product information available on	• On Smartphone app • On website • In catalog
Purchase history available	• Personal size recommendation and order history • Order history • No order history available

Step 3: Experimental design.
After selecting the attributes and measurement units, the experimental design follow. This was the step that is used to define the choice profiles. The given attributes and levels in Table 8 are the input data for the factorial design. A full factorial design contains all possible combinations, the number of profiles would be $3^6 \times 2 = 1.458$ profiles. This is a large set for the respondent and not feasible (Sanko, 2001). To reduce the number of profiles a fractional factorial design was used, with 18 combinations of profiles. In statistical terms, the used attributes in a fractional factorial design are orthogonal and do not correlate (Hensher et al., 2015). The fractional factorial design is presented in Table 9.

Table 9 Fractional factorial design of the stated choice experiment

N	Attribute 1	Attribute 2	Attribute 3	Attribute 4	Attribute 5	Attribute 6	Attribute 7
1	0	0	0	0	0	0	0
2	0	1	1	2	1	1	1
3	0	2	2	1	0	2	2
4	1	0	1	1	0	1	2
5	1	1	2	0	1	2	0
6	1	2	0	2	0	0	1
7	2	0	2	2	0	1	0
8	2	1	0	1	0	2	1
9	2	2	1	0	1	0	2
10	0	0	2	1	1	0	1
11	0	1	0	0	0	1	2
12	0	2	1	2	0	2	0
13	1	0	0	2	1	2	2
14	1	1	1	1	0	0	0
15	1	2	2	0	0	1	1
16	2	0	1	0	0	2	1
17	2	1	2	2	0	0	2
18	2	2	0	1	1	1	0

The fractional factorial design in Table 9 was imported into the Bergenquete 2.2 system of the TU/e. Appendix 4 visualizes the design with corresponding attributes.

Step 4: Questionnaire development

The first part of the questionnaire asked about socio-demographic and shopping-oriented characteristics. The stated choice experiment then followed with the different choice tasks. The different choice tasks were compiled by random drawing two retailer profiles from the research design. To ensure that the choice tasks, attributes and levels were clear for the respondents, an introduction explained the different attributes and corresponding levels. In addition also an explanation was given for the option 'none of these', which represents that the respondent rather would shop somewhere else. This introduction also contained an example of a choice task. Figure 5 presents the example of a choice task and the stated choice experiment consisted of 9 different choice tasks.

	Alternatives		
Characteristics	Retailer 1	Retailer 2	None of these
Channel to buy and receive the product	*Online store + home delivery*	*Physical store + Physical store pick up*	
Product availability	*Unknown*	*Yes, also how many items*	
Returning product	*Return at pick-up point for free*	*Return at pick-up point for €3.50*	
Product price	*5% more expensive than average*	*5% cheaper than average*	
Product range consists of	*Popular assortment*	*Niche assortment*	
Product information available on	*On website*	*In catalog*	
Purchase history available	*Order history*	*No order history available*	
	O	●	O

Figure 5 Example of a choice task as presented in the questionnaire

3.5 Conclusion

To answer the research question, this chapter explained the steps for data collection and data analysis. Multiple methods were used to collect preference data from consumers via an online questionnaire divided into two different sections. The first section collected the socio-demographic data, psychographic, and the shopping frequency data. The second section contained a stated choice experiment with 9 different choice sets to collect data with shopping preference information.

The socio-demographic characteristics refer to the respondents' personal characteristics. In addition, information was collected about the frequency of online shopping and of shopping at physical stores. More psychographic data was also gathered to determine why and how purchase decisions are made; this was done using multiple agree/disagree statements. The psychographic variables were those that influenced consumers in their purchase decisions. The second part of the questionnaire consisted of the stated choice experiment, for which multiple choice tasks were developed. Each choice task contained two choice alternatives with attributes, and these attributes each had varying levels. In total, seven attributes were developed, each of which had two or three attribute levels that varied. The attributes were: place to buy and receive products, product availability, product return options, product price, product range, product information availability, and purchase history. Each attribute contributed to the overall shopping preferences, and by presenting different choice tasks to each respondent, a proper range of variation for each attribute will became visible.

The data was collected by sending an e-mail to a few thousand e-mail addresses. The questions and stated choice experiment were translated into a questionnaire that was conducted using the Bergenquete 2.2 system. The data collection is performed and described in Sections 4 and 5.

4   Data description and analysis

In this chapter the collected data is analyzed and described. The first part of this chapter contains a detailed description of the research sample, including socio-demographics and psychographic characteristics. These are important and contribute to the further analysis and results of the model estimation in section 5.

4.1 Sample description

The questionnaire was distributed on the 31th of May 2018 by e-mail to the customer base, as described in Section 3.2.2. This e-mail contained a personal introduction, the goal of the research, and a direct link to the Bergenquete 2.2 system with the questionnaire. In total, 268 respondents were willing to cooperate and completed the questionnaire. The stated choice experiment was presented in the second part of the questionnaire, and 8 respondents made inconsistent choices during this stated choice experiment; these 8 respondents were therefore removed from the research sample. To gain information about the research sample, different socio-demographic characteristics were collected; thee are shown in annex 5. The following paragraphs describe all the socio-demographic characteristics, and odd or surprising values.

When comparing the characteristics of the research sample to the population of the Netherlands, differences and similarities are visible. Table 10 contains a column for the research sample and another for the Dutch population. For each variable, the corresponding percentages are given. The performed chi-square tests for all socio-demographic variables are significant, which means that differences exist between the research sample and Dutch population for these variables.

Table 10 Socio-demographic characteristics of the research sample

		Sample (N)	Sample (%)	Dutch population %[2]
Gender	Male	51	19.6%	49.6%
	Female	209	80.4%	50.4%
Age	20 - 29	35	13.5%	16.2%
	30 - 39	55	21.2%	15.4%
	40 - 49	66	25.4%	18.8%
	50 - 59	72	27.7%	19.7%
	60 - 69	26	10.0%	16.7%
	70 >	6	2.3%	16.2%
Household	One person household	38	14.6%	23.7%
	Couple without child(ren)	88	33.8%	35.3%
	Couple with child(ren)	120	46.2%	32.4%
	Single parent with child(ren)	6	2.3%	4.5%
	Multi-person household without child(ren)	8	3.1%	4.1%
Education	Primary education	1	0.4%	14.8%
	V(m)bo, lts, lbo, Huishoudschool	6	2.3%	
	Mavo, (m)ulo	9	3.5%	27.2%
	Havo, vwo, hbs	45	17.3%	
	Mbo, mts	29	11.2%	41.3%
	Hbo, pabo, hts, heao	105	40.4%	26.1%
	Wo (master, PhD, gepromoveerd)	65	25.0%	14.9%
Total		260	100%	100%

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[2] All data in this column is from CBS (CBS, 2018)

4.1.1 Gender and age

The research sample contained 260 respondents, of whom 80% were females and 20% males. Earlier research on consumers' shopping preferences in the Netherlands showed comparable results in this regard (Farag, 2006). There could be numerous reasons for this distribution; for instance, shopping might seem more fun for women than for men, and therefore women could have been more willing to fill in the questionnaire.
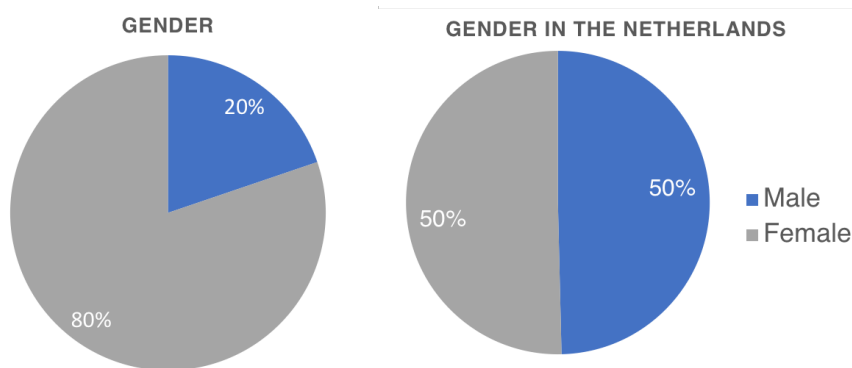
Figure 6 Gender distribution of the research sample compared to The Netherlands

In addition to the respondents' gender, data was also collected about age using a ratio level of measurement. The Shapiro-Wilk test showed no normal distribution; the histogram for this distribution is presented in annex 5. To further describe the age data, it was recoded into six different age groups. In the sample, the average age of all respondents was 45.43 years. Figure 7 shows the different age groups. The research sample contained far fewer respondents older than 70 compared to the Dutch population. The underlying reason for this could be that older people shop less online and also have less internet experience (Farag, 2006). Another explanation could be that this age group was less represented in the used customer base.
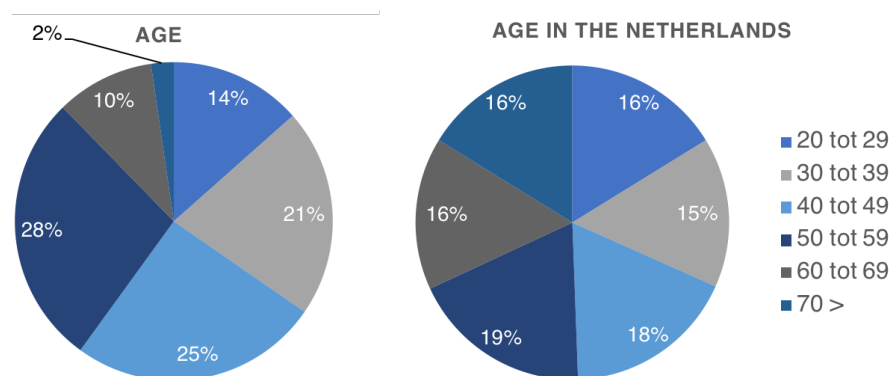
Figure 7 Age distribution of the research sample compared to The Netherlands

4.1.2 Household situation

The respondents' household situation showed almost no similarities compared to the Netherlands. For instance, couples with children represented 47% of the research sample instead of 32%, which is their share in the Netherlands as a whole. All other household

situations were slightly less represented than in the general population. Figure 8 presents the household situation of the research sample in pie charts, with percentages.
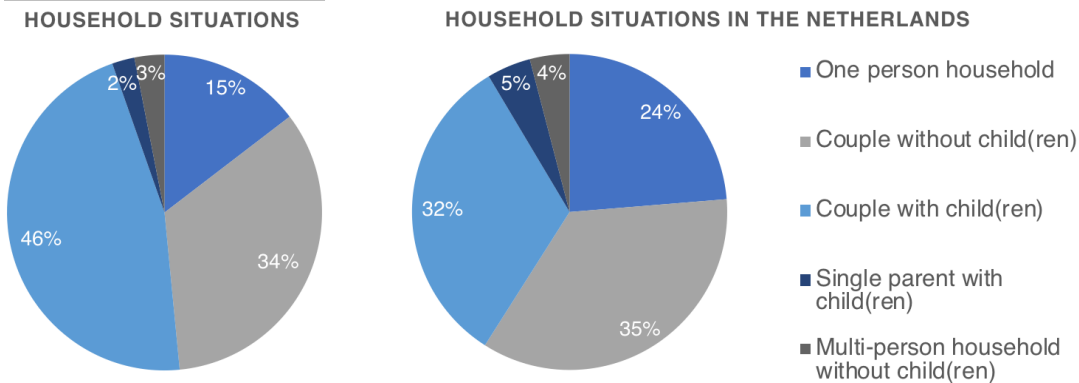
Figure 8 Household situation of the research sample compared to The Netherlands

4.1.3   Level of education

The respondents were also asked for their highest level of education, divided into seven different levels in the questionnaire. To compare this to the Dutch population, three levels were merged and combined into four categories: primary and secondary school, intermediate vocational education, higher professional education and university. The largest group in the sample had a higher professional education, while the group with the intermediate vocational education was much smaller.
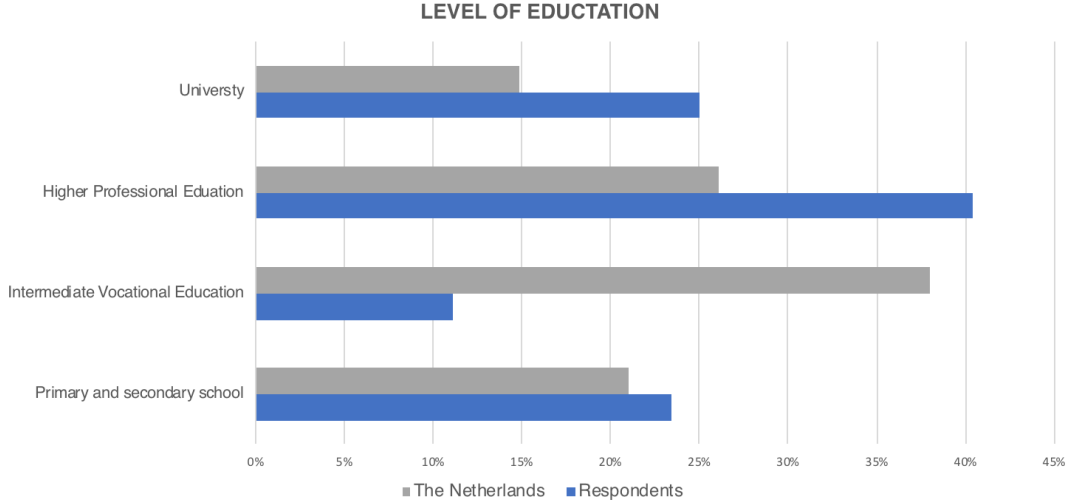
Figure 9 Level of education of the research sample compared to The Netherlands

4.1.4   Respondents per province in The Netherlands

The respondents' zip codes were also collected. These zip codes could be used to check the distribution of the research sample over the provinces in the Netherlands. Figure 10 on the next page presents the number of respondents from each province on a map of the Netherlands. They were spread out across the provinces, but most lived in the west and south regions of the country, while the fewest lived in the north. Noord-Brabant was chosen the most on the questionnaire, with 66 respondents living there.
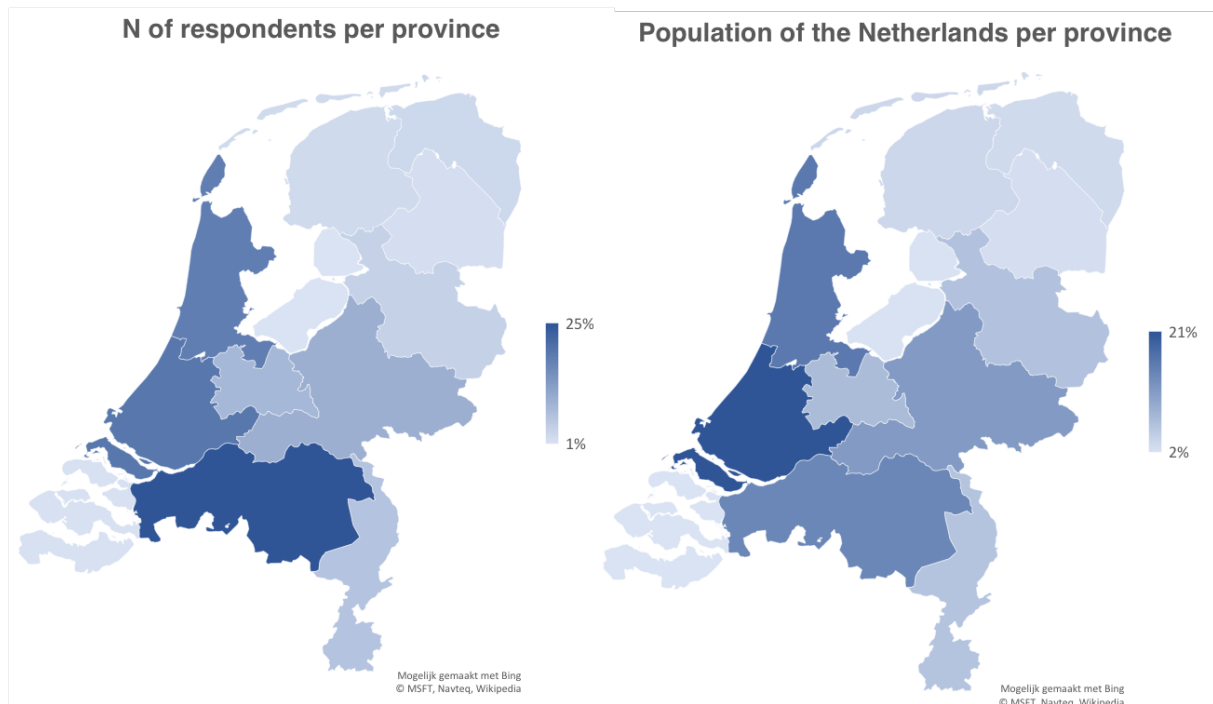
Figure 10 Distribution of the research sample over the provinces in The Netherlands

When summarized, the sample's socio-demographic data shows differences and similarities compared to the population of the Netherlands. Large differences are found in the male-female ratio and in the levels of education. Smaller differences are also found within the other variables. All these similarities and differences need to be considered when interpreting the analysis and results of the psychographic and model estimations in the next sections.

4.2 Shopping behavior and psychographics

This section analyzes and compares the frequency of shopping in the online and offline channels. Furthermore, additional information was collected to analyze the respondents' psychographics characteristics. Data was gathered in the Bergenquete 2.2 system by presenting multiple agree/disagree statements. Psychographics data can help describe shopping motivations and interests.

4.2.1   Frequency of shopping online and offline
In the survey, the respondents were asked to indicate their frequency of online and offline shopping during a period. This data is presented in Figure 11 on the next page. All respondents indicated that they shopped online or offline at least once a year; the variable "never" is therefore not shown in the pie charts in Figure 11. An interesting shift took place when the frequency of shopping was more than once a week. Namely, most of the respondents shopped less in a physical store and more online. In contrast, it can also be seen that the majority shopped in physical stores 1 to 2 times per quarter or less. The online shopping frequency was higher among those who shopped 1 to 2 times per month or more. The left pie chart also shows that none of the respondents shopped in physical stores more than once a week.

SHOP OFFLINE FOR CLOTHING   **SHOP ONLINE FOR CLOTHING**

- Less than once a year
- 1 to 3 times each year
- 1 to 2 times each quarter
- 1 to 2 times each month
- 1 time each week
- More than 1 time each week
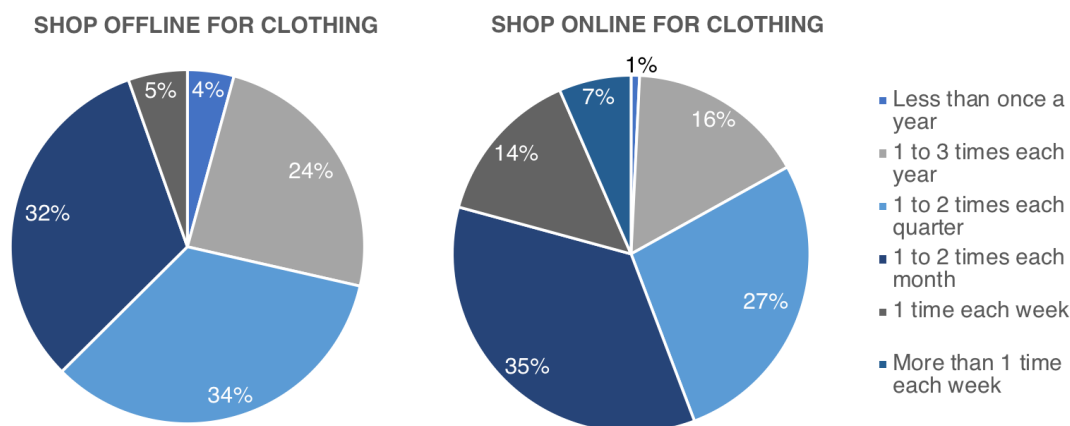
Figure 11 Frequency of online shopping and physical shopping

4.2.2 Psychographics and motivation to shop

Data was collected about the respondents' psychographic shopping preferences and motives. The data was collected using 18 different statements that could be answered on a 5-point Likert scale (1=fully disagree, 5=fully agree); these statements were also presented in section 3.4.2. As concluded in earlier research by Konuş et al. (2008), psychographic characteristics play an important role in consumers' shopping motives and preferences, compared to social and demographic characteristics. Section 5 compares the respondent's psychographic characteristics to the latent class model to find similarities between the classes.

To collect the psychographic data, 18 different statements were used, based on six different psychographic themes: creativity/innovativeness, loyalty/brand consciousness, motivation to conform/self-improvement, shopping enjoyment, time pressure, and economic/price consciousness. For each psychographic theme, Cronbach's alpha was used to check for internal consistency within the statements. The more comprehensive calculation is visible in annex 6, and for each psychographic theme, the Cronbach's alpha value is presented in Table 11.

In almost all situations, Cronbach's alpha approached 0.7. Two statements were deleted to improve the Cronbach's alpha: "*I generally do my shopping the same way*" (enjoyment) and "*Wearing designer clothes give me social status*" (motivation to conform). The Cronbach's alpha values after deleting these statements are shown in the right column of Table 11.

Table 11 Cronbach's alpha for each psychographic characteristic

Psychographic	Cronbachs alpha	Cronbachs alpha after deleting
Creative	0.74	
Economic	0.66	
Enjoyment	0.81	
Loyal	0.57	0.62
Motivation to conform	0.50	0.67
Time pressure	0.77	

All psychographic statements were combined into a mean value after calculating the Cronbach's alphas, as shown in Table 11. In Figure 12, the highest scores are on the left, and the lowest are on the right. The psychographic characteristics with the highest average score were economic and motivation to conform. However, the underlying differences were not very large.
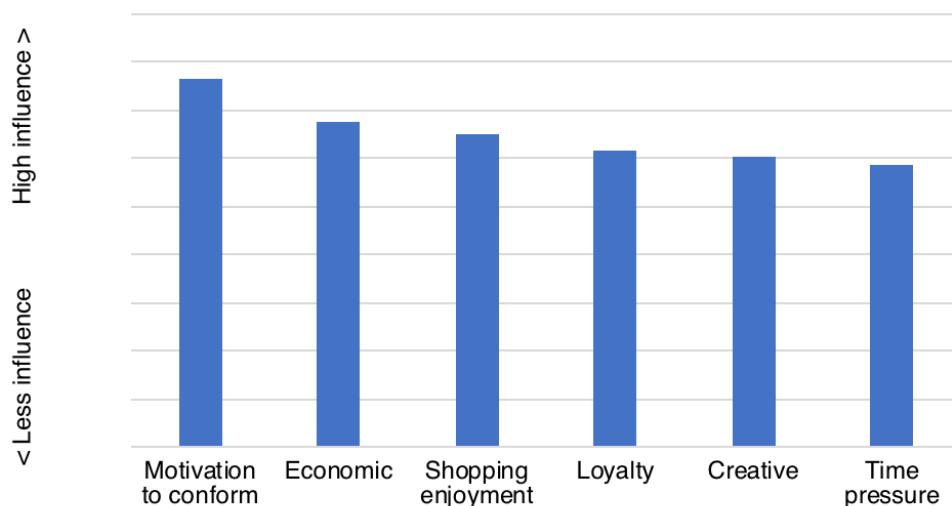
Figure 12 Average scores of each psychographic characteristic

4.3 Conclusion

This chapter analyzed the socio-demographic and psychographic variables using multiple methods. Differences and inconsistencies within the research sample were identified. In total 268 respondents cooperated and finished the questionnaire. However, the research sample ultimately consisted of 260 respondents, because 8 made inconsistent choices in the stated choice experiment; they indicated that the experiment was unclear and consistently gave no preference for a retailer in the experiment. The research sample is not representative for the Dutch population, and this needs to be taken into account when interpreting the results.

The research sample consisted largely of women (80%). Furthermore, far fewer respondents were older than 70 in comparison to the Dutch population, while the average age in the sample was 45.43 years old, which is slightly older, than the general population. Other differences between the research sample and the population were also visible in the household situation and level of education.

Most of the respondents shopped more online than in physical stores. The majority shopped at physical stores 1 or 2 times per quarter or less, and shopped online 1 to 2 times per month. Information was collected about six different psychographic characteristics of the research sample using different statements with a Likert scale. Two statements were deleted to improve internal consistency and reliability. The psychographic characteristics with the highest average score were "motivation to conform" and "economic". However, the differences were not very large.

5   Model estimation and results

This chapter presents the data analysis and uses the data to estimate a multinomial logit model and latent class models. Both models are estimated using NLOGIT 5 software (NLOGIT5 (version 5) , 2018). The variables in the dataset are transformed with effect coding before carrying out the analysis. Section 5.1 explains the preparation and transformation of the dataset. The models can then be estimated, tests can be executed, and the performance and reliability of models can be calculated using McFadden's Rho-square. The output of the model estimation is shown in annex 9 and 10. Finally, the chapter also uses the socio-demographic and psychographic variables and analyzes the heterogeneity of the model.

5.1 Data preparation

In the data preparation phase, the different results were coded into a single data file before analyzing and importing the dataset. The goal was to create a single comma-separated data file. The export from the Bergenquete 2.2 system contained all variables and before the data analysis, the dataset was coded using effect coding. With effect coding, it is possible to specify the exported variable for a set of dummy variables; the exported variable receives a value of minus one (-1), zero (0), or one (1). This value is depends on the number of levels for each variable and the scale (Hair et al., 2014). Annex 7 provides the codebook that was developed to link each exported variable with a usable dummy variable.

After the effect coding, the dataset was imported, and parameter estimation provided a multinomial logit model and a latent class model. Both models made is possible to determine the added value of online and offline channel integration options compared to other shopping preferences. As mentioned earlier, the research sample contained 268 respondents, of whom 8 were omitted. The latter indicated that the experiment was unclear and consistently gave no preference for a retailer in the stated choice experiment. Hence, a total of 260 respondents completed the stated choice experiment, and 2340 choice sets were presented to them.

5.1.1   Effect coding

To create a valid and usable input for the software, the exported values were recoded with effect coding. Before setting up the survey, the variable levels were coded with numbers (1, 2, 3, 4, 5 etc.) in the Bergenquete 2.2 system. All seven attributes from the stated choice experiment with the corresponding levels were recoded to create the single comma-separated data file. After effect coding, the numbers were assigned are assigned to the variables, as presented in Table 12.

Table 12 Effect coding used for converting dataset

2-level attribute		3-level attribute	
Attribute level 1	-1	Attribute level 1	1 , 0
Attribute level 2	1	Attribute level 2	0 , 1
		Attribute level 3	-1 ,-1
Constant			
Retailer 1	1		
Retailer 2	1		
None of these	0		

Before calculating the MNL and LCM, also the constant parameter E0 was added to represent the choice "none of these" if the respondents had no preferences between the presented retailers in the stated choice experiment. This parameter was coded as one (1), one (1) for the retailers 1 and 2, respectively, and zero (0) for the choice "none of these". In addition to the effect coding variables, the names were also changed as shown in annex 7.

5.2 Multinomial logit model

By using the multinomial logit model, the effect of channel integration options within consumers preferences could be determined. This model estimates the part-worth utility weights (β) for each attribute level; these weights (β) represent the relative preference for a certain attribute level in relation to other attribute levels. A negative or positive utility weight value indicates the preference for this attribute. Before interpreting the part-worth utility and total attribute utility, it is important to check the goodness of fit of the multinomial logit model. The goodness of fit indicates whether the model performs well, which is the key when interpreting the estimated model values from NLOGIT5.

5.2.1 Goodness of fit

The output of the estimated multinomial logit model is presented in annex 9 and in Table 14. The goodness of fit is expressed as McFadden's Rho-square, and the adjusted Rho-square is also calculated. The loglikelihoods of the estimated parameters in the multinomial logit model and from the 0-model are presented below:

- Log-likelihood *(β)* of the estimated model = -2096.20
- Log-likelihood of the 0-model *LL(0)* = -2570.75

Table 13 MNL model parameters

Sample size	2340
K	14
LL (0)	-2570.75
LL (ß)	-2096.20
ρ^2	0.185
$\rho^2 adj$	0.179

The goodness of fit value is always between 0 and 1 and when McFadden's Rho-square is near or above 0.2 the estimated model can be interpreted as usable (van de Koevering et al., 2018). Section 3.3.2. further explained goodness of fit and McFadden's Rho-square.

The model that estimated the respondents' preferences for channel integration had a lower McFadden's rho-square of 0.185. This does not mean that the model is not valid, but it is possible that there was much unobserved heterogeneity in the collected data of the research sample. Other reasons for this can be many random errors, faults, and indifferences in the choices made in the stated choice experiment. In addition, the adjusted Rho-square was calculated and is given in Table 13.

5.2.2 Utility parameters and significance

For each attribute level, the part-worth utility (β) and significance were estimated. In addition, the total attribute utility was calculated; this explains the overall importance of each attribute. The part-worth utility (β) can be negative or positive, which represents the influence of this attribute level on the consumers' preferences. The attribute levels also contain a significance parameter; this can be determined on a 1%, 5%, or 10% significance level. When a specific part-worth utility is significant, we reject the null-alternative, which means that the corresponding attribute level is relevant when choosing a specific retailer and that there are underlying causes for the occurrence. Table 14 presents the estimated multinomial logit model with part-worth utilities (β) and significance values. The calculated part-worth utilities that are not significant are more likely to occur by coincidence, without underlying causes. In the last column, the range for these attributes has therefore been adjusted to zero.

Table 14 Multinomial logit model output from NLOGIT5

Attributes	Levels	Part-worth utility	Significance	Utility range
Constant	Constant	1.312	0.000***	
Channel to buy and receive product	Online store + home delivery	0.236	0.004***	0.496
	Online store + pick up point	-0.248	0.000***	
	Physical store + physical store pick up	0.013		
Product availability	Unknown	-0.395	0.000***	0.791
	Available, Stock information available	0.141	0.003***	
	Available. No stock information	0.254		
Returning product	Return at pick-up point for free	0.215	0.000***	0.500
	Return at pick-up point for €3.50	-0.250	0.000***	
	Arrange return shipment yourself at own costs	0.035		
Product price	5% more expensive than average	-0.416	0.000***	0.832
	5% cheaper than average	0.407	0.000***	
	Price the same as average	0.009		
Product range consists of	Popular assortment	0.002	0.969	0.000
	Niche assortment	-0.002		
Product information available on	On smartphone app	0.001	0.987	0.000
	On website	-0.061	0.234	
	In catalog	0.060		
Purchase history available	Personal size recommendation and order history	0.010	0.855	0.276
	Order history	0.128	0.039**	
	No order history available	-0.138		
Significance (1% = ***, 5% = **, 10% = *)				

Table 14 presents all part-worth utilities, the range of each attribute, and the corresponding significance levels. For attributes that are not significant, the range is set to a value of zero and their influence can be neglected. The total range of each attribute is calculated by the width of the range of the part-worth utilities. In the column on the right, the utility range is presented for each attribute; it represents the total importance of each attribute. Whether the attribute level contributes in a negative or a positive way has no influence on the utility range.

Figure 13 presents the total range for each attribute from high to low. Product price and product availability are the most important attributes, with a total utility of 0.832 (β) and 0.791 (β) respectively. Both attributes that were not significant received the utility range zero and are not included in the bar chart.
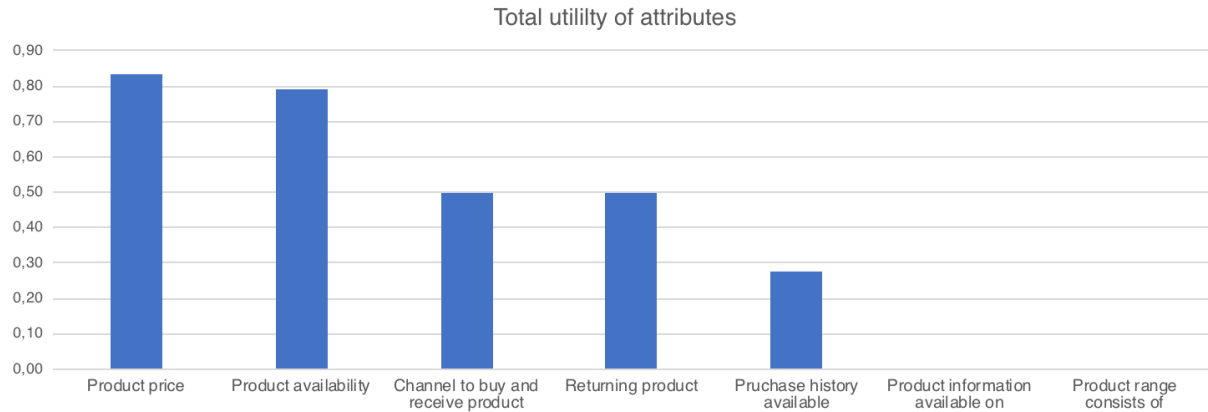
Figure 13 Range and importance of each attribute

Figure 13 shows the part-worth utility values for each attribute level. All significant attribute levels on a 1% or 5% level are marked in green, while those that are not significant are presented in red. The attribute levels for product availability are all significant on a 1% level and therefore marked in green. Availability of a product has a higher importance, while further information about the actual stock amount is less valuable. This is also visible when looking at the highest utilities for both levels: $\beta=0.254$ and $\beta=0.141$, respectively. Consumers prefer the certainty that products are available, which is in line with earlier research by Rob (2016). When choosing between two retailers, the retailer that shows actual stock information is much more preferred over the retailer that causes uncertainty about the product availability. When the product is not available, consumers are likely to choose other alternatives.
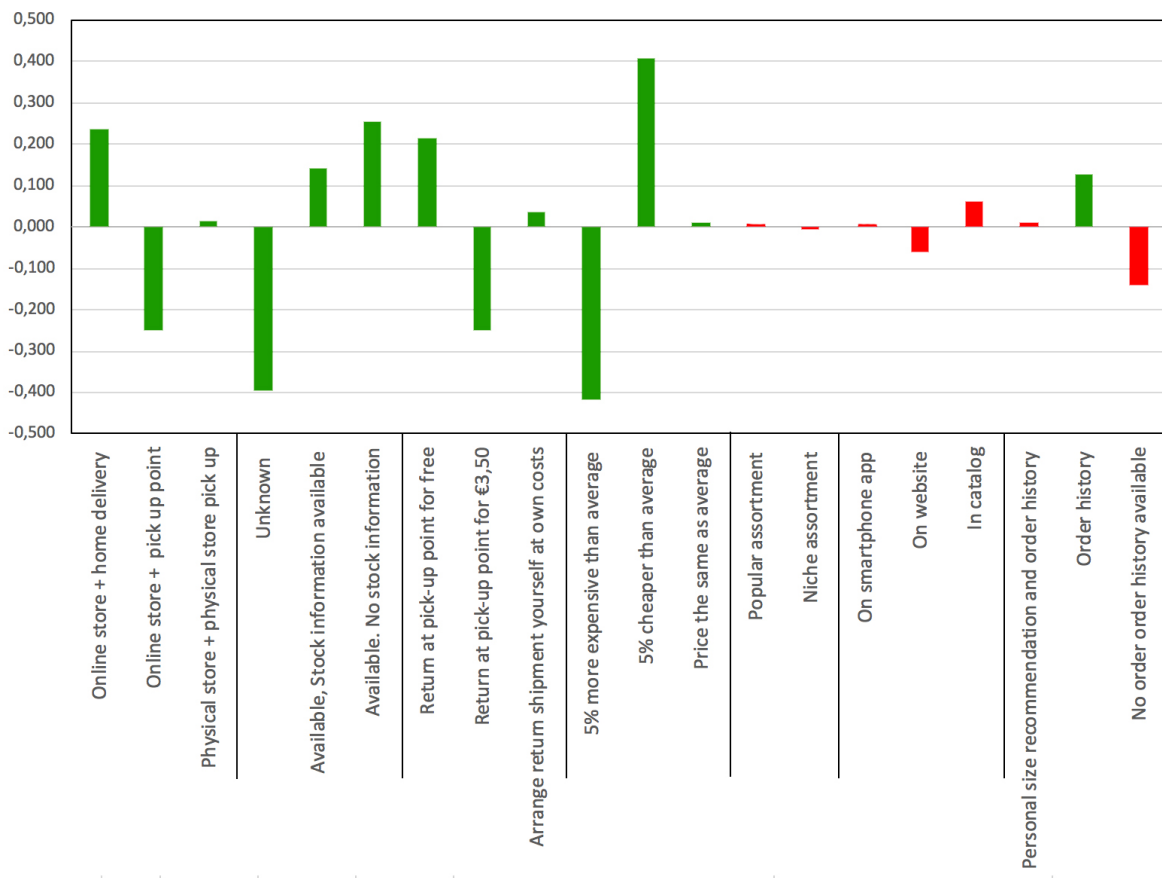
Figure 14 Attribute level importance and significance

When consumers need to choose between retailers, they attach the highest importance to the product price. Retailers with an average product price or a lower one are most preferred. With a part-worth utility of β= 0.407, a lower product price is preferred, while a more expensive product is less preferred with a negative part-worth utility of β= -0.416. These large differences also explain the high utility range. All levels of the price attribute are significant (p < 0.01).

Current retailers offer multiple ways to buy and receive products. With a utility of β=0.236, consumers prefer ordering online and receiving the product at their home address. The second most preferred option is shopping at a physical store (β=0.013). These two options require no secondary action, compared to choosing pick-up point delivery. Delivery options such as the latter still require customers to drive and collect their order elsewhere. Hence, ordering from an online store and collecting the order at a pick-up point is less preferred, with a utility of β=-0.248.

Multiple options were presented in the experiment to return products. Doing so at a pick-up point for free (β=0.215) is most preferred. In contrast, consumers have less preference for arranging the return of the product themselves or returning the product with extra costs at a pick-up point. Offering options to easily return products at a pick-up point also can result in competitive advantages, because consumers often view returning products as a painful and difficult process (Stock et al., 2006). Less preferred is the option to return products at a pick-up point and pay a fee of €3.50 (β=-0.250).

With a utility of β=0.128, order history is more preferred than personal size recommendation in combination with order history β=0.010. However, it is not clear why the less complete attribute is favored over the more complete attribute. In total, order history is seen as the sixth most important attribute with a utility range of β=0.122. Order history can stimulate loyalty, because ordering former purchases again can be seen as brand or product loyalty. Retailers who have no order history available are less preferred by consumers (β=-0.138).

The specific product range that a retailer offers is less important to consumers than other preferences and integration options. No significant result was found in terms of preference for niche assortment or a popular assortment.

Furthermore, the channel used for the presentation of product information is not very important to consumers. The differences between the levels of this attribute are small and not every attribute level is significant. Product information on the website received a utility of 0.234 (β), but this is not significant.

5.3 Latent class model

It is possible to estimate multiple discrete groups by using latent class models; multiple models with different classes were estimated with NLOGIT5. These groups were calculated and based on the data to account for non-continuous heterogeneity. Furthermore, an extra variable was added to the dataset; the probability of being part of one of the groups. The most suitable latent class can be found by analyzing different criteria, such as goodness of fit and the AIC. In total up to three different latent class models were estimated. The following sections describe the goodness of fit, utility parameters with significance, and the latent class model characteristics.

5.3.1   Goodness of fit
The overall performance of the latent class model is critical for interpreting and analyzing that model. Latent class models with a maximum of three classes were estimated. An attempt was also made to estimate a model with four classes, but this resulted in a longer estimation process, and eventually the model did not converge. Table 15 presents the different performance criteria of all models. The goodness of fit, log-likelihood, and AIC were calculated to determine the model. The most suitable estimated latent class model was used for further analysis and for comparison with the socio-demographic data.

Table 15 Latent Class parameters

Number of Latent Classes:	LL (ß)	# Parameters	AIC	AIC/N	McFadden's Rho-square	Adjusted Rho-square
1 (MNL)	-2096.19	14	4220.4	1804	0.185	0.179
2	-1974.81	29	4007.6	1713	0.232	0.221
3	-1948.64	44	3985.3	1703	0.242	0.225

The second column of Table 15 presents the log-likelihood of the estimated parameters. When the number of classes increases, so does the log-likelihood. The AIC was also calculated; this criterion takes into account the number of parameters, and looks at the performance of the model and predictive power to select the most suitable model. The model with the lowest AIC can be considered as the best model, but still McFadden's Rho-square, the number of standard errors and the size of the classes also need to be considered.

The log-likelihood grows for each model, as the number of classes increases, while the AIC decreases. The latent class model with three classes performs the best when considering the log-likelihood in combination with the AIC. However, standard errors increase for some variables in the latent class model with three classes. In addition, one of these classes is hardly usable, because of its small size. Therefore, the latent class model with two classes and a log-likelihood of -1974.81 performs the best overall. This model has a McFadden's Rho-square goodness of fit of $\rho^2_{adj} = 0.232$ and an adjusted Rho-square of $\rho^2_{adj} = 0.221$. The latent class model is comprehensively presented in Table 16 and Figure 15.

5.3.2   Utility parameters and significance
The latent class model with two classes has the highest performance and best fit. Table 16 presents the structure of both classes with the part-worth utility, significance, and total attribute utility. Approximately 74% of the total research sample belongs to class I, and 26% to class II.

Most attributes are significant, but the utility range of those that are not is adjusted to zero. In Table 16, the three last rows consist of attributes with a lower significance than required. The calculated part-worth utilities that are not significant for each class are more likely to occur by coincidence; no underlying causes are found for these observations. In the last column, the utility range for these attributes has therefore been adjusted to zero. Most levels of the

attributes "channel to buy and receive products," "product availability," "options to return product," and "product price" are significant.

Table 16 Latent Class output for two classes

Attributes	Levels	Class I			Class II		
		Part-worth utility	Significance	Utility range	Part-worth utility	Significance	Utility range
Constant	Constant	2.992	0.000***	2.992	-1.883	0.178	0.00
Channel to buy and receive product	Online store + home delivery	0.368	0.165	0.74	0.177	0.153	0.46
	Online store + pick up point	-0.227	0.054*		-0.229	0.056*	
	Physical store + physical store pick up	-0.140			0.053		
Product availability	Unknown	-0.408	0.000***	0.82	-0.382	0.000***	0.76
	Available, Stock information available	0.105	0.409		0.174	0.067*	
	Available. No stock information	0.303			0.208		
Returning product	Return at pick-up point for free	0.179	0.161	0.00*	0.263	0.005***	0.57
	Return at pick-up point for €3.50	-0.161	0.335		-0.286	0.007***	
	Arrange return shipment yourself at own costs	-0.018			0.023		
Product price	5% more expensive than average	-0.604	0.004***	2.59	-0.464	0.000***	0.93
	5% cheaper than average	-0.691	0.006***		0.364	0.003***	
	Price the same as average	1.296			0.099		
Product range consists of	Popular assortment	-0.099	0.543	0.00	0.059	0.476	0.00
	Niche assortment	0.099			-0.059		
Product information available on	On smartphone app	-0.114	0.602	0.00	-0.016	0.882	0.00
	On website	-0.065	0.569		0.019	0.843	
	In catalog	0.179			-0.003		
Purchase history available	Personal size recommendation and order history	-0.067	0.697	0.00	-0.014	0.902	0.00
	Order history	-0.098	0.591		0.091	0.404	
	No order history available	0.165			-0.077		
Total utility			5.39			3.064	
Probability class I and II			0.74			0.26	
* Significant (1% = ***, 5% = **, 10% = *)							

Differences between the two classes are found for a couple of attributes; Figure 15 provides a clear overview of these differences. Some attributes are not significant; and therefore, the following sections do not further discuss product range, product information, and order history. The largest differences between both classes relate to the retailer's price competitiveness, options to return products, and product availability. Interesting and difficult is class I's preference for the price attribute: They prefer an average price to one that is 5% lower. Class I is the largest class with 192 respondents, while 68 respondents belong to class II.
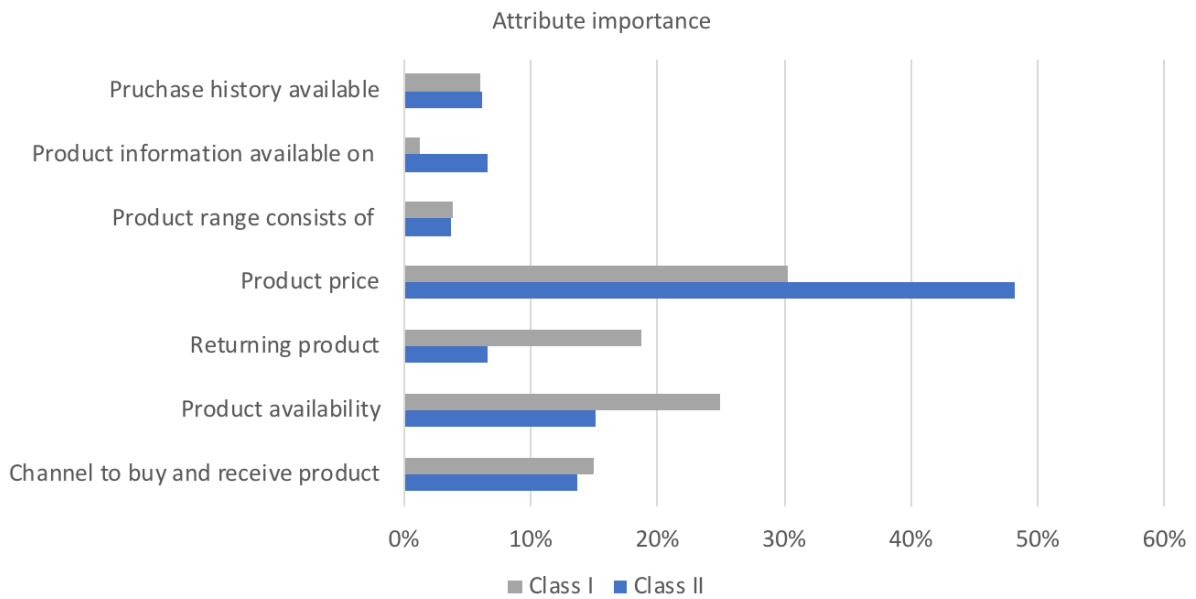
Figure 15 Attribute importance for latent class model

5.3.3 Class number I: Active shoppers

Some differences were found in attribute importance for class I. The consumers in class I value product prices less and services more, such as return possibilities and product availability. For the other attributes, the importance is equal between the two classes. Furthermore, consumers in class I prefer good product availability and the option to return options for free. The latter has a part-worth utility of β=0.179. As stated earlier product price mattes less for the consumers in class I; they prefer good product availability, with a part-worth utility of β=0.303, and online shopping with home delivery (β=0.368) instead of shopping at the physical store (β=-0.140). The shoppers in class I are defined as "active shoppers."

5.3.4 Class number II: Price conscious shoppers

The consumers in class II find the product price more important those in class I do. When choosing between different retailers, class II consumers are likely to prefer the retailer with a 5% lower product price (β=0.364). In some situations, it can be assumed that consumers in class II even are willing to sacrifice extra services for a lower price. The shoppers in this class are defined as "price-conscious shoppers." These consumers find options to return a product less important than product prices. However, with a utility of β=0.263, they prefer returning the products for free at a pick-up point. Figure 15 shows the difference between class I and class II. Consumers in class II do prefer shopping online and receiving products at home, but only slightly more than they like shopping at a physical store.

5.4 Latent class characteristics

Based on the latent class model, it is possible to divide the research sample into two classes with different characteristics. The socio-demographic and psychographic differences between the two classes are described in this section. Chi-square tests are used to check for significant differences between them and the socio-demographic nominal variables. In addition, independent-samples T-tests are used to find differences between the two classes and socio-demographic interval variables. Furthermore, the psychographic characteristics are analyzed and compared between the two classes; however, these results are not significant. Annexes 13, 14, and 15 present the different statistic values and graphs.

5.4.1 Socio-demographic characteristics

The 260 respondents are split into two classes, with few differences in nominal socio-demographic characteristics between them. Using chi-square tests, a significant relationship ($p < 0.05$) is found between households with and without children for each class. However, the effect of this relationship can be seen as low or almost negligible, because of the low Phi value. Table 17 presents the chi-square value of the household relationship with the latent class model. For the other variables, such as gender and education no significant relationships are found between the two classes. Figure 16 and Figure 17 also show the percentages for each variable for both classes.
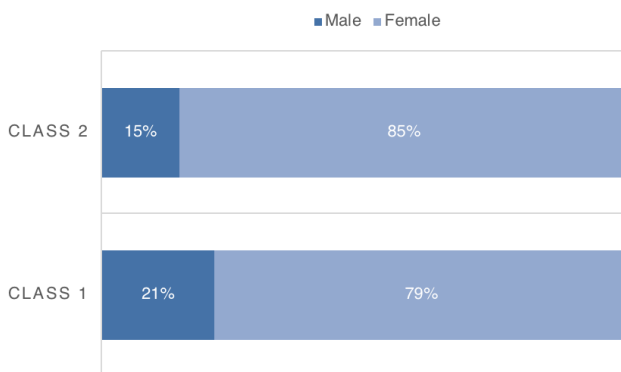
Figure 16 Chi-square test for gender variable
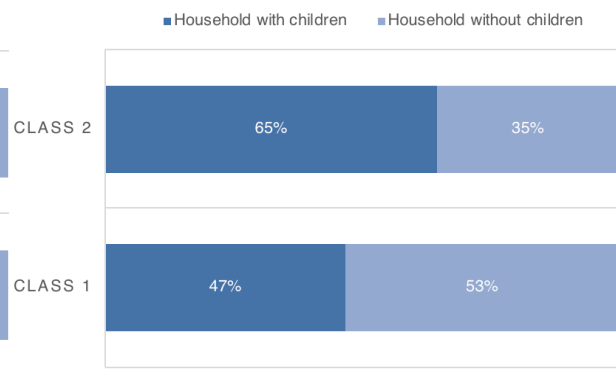
Figure 17 Chi-square test for household with or without children variable

Table 17 Independent-samples T-test and chi-square value results

Variable	Chi-square	
Gender	1.408	0.235
Household	6.392	0.011
Education	7.067	0.132

Variable	Class	Mean	Std, Deviation	F	Sig.
Age	Class I	43.47	12.31	0.122	0.727
	Class II	50.96	12.79		
Online shopping	Class I	4.74	1.13	0.027	0.870
	Class II	4.40	1.10		
Offline shopping	Class I	4.21	0.94	0.321	0.572
	Class II	3.82	1.06		

To find significant differences in characteristics between the two classes, multiple independent-samples T-tests are carried out. These tests are used to find differences between the ratio and interval variables of the socio-demographic and psychographic characteristics. Table 17 presents the three significant findings with the results of the independent-samples T-tests. The independent-samples T-tests in Table 17 concern the age, online shopping frequency and physical shopping frequency variables. In addition, these tests are also conducted for the different psychographic characteristics collected using agree and disagree statements. Annex 14 presents the results of the independent-samples T-tests between the psychographic characteristics and two latent classes; no significant relationship is found.
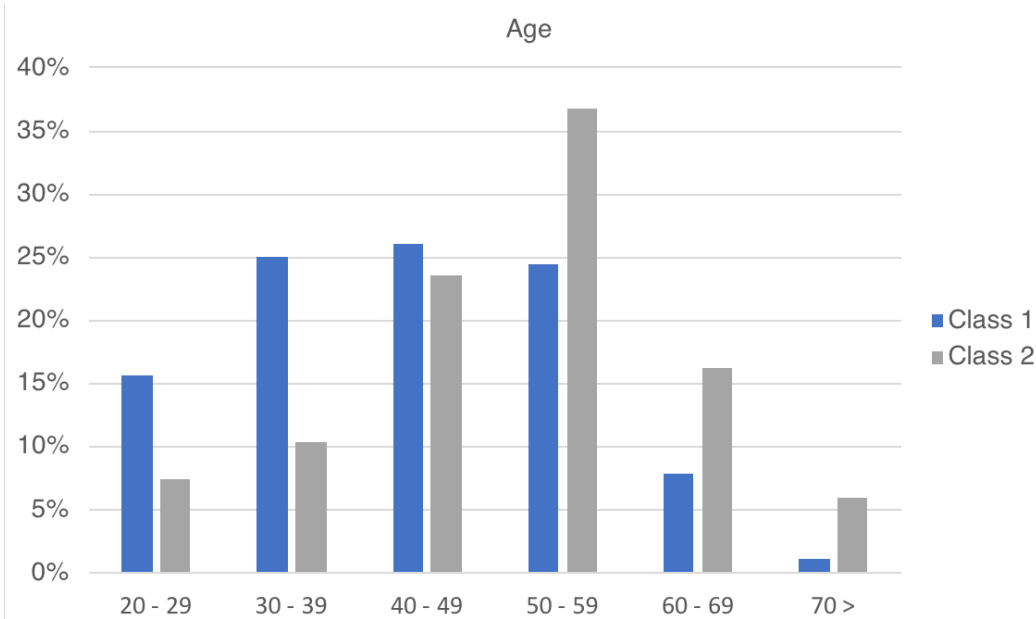
Figure 18 Age distribution in the latent class model

Significant differences are found between the classes' age characteristics, using the range of the age variable and an independent-samples T-test. Table 17 shows that the mean of the age variable in class I (active shoppers) is lower than that of class II (price conscious shoppers). Most active shoppers belong to the three youngest age classes: 20-29, 30-39, and 40-49. In addition, the 95% confidence interval of the difference is negative in both situations. Figure 18 shows the age difference between the classes in a bar chart.

5.4.2 Online and physical shopping frequency
A significant relationship is also found between the online and physical store (offline) shopping frequency of both classes. In Figure 19 it is clear that on average, the respondents in class I shop more than those in class II. On average, those in class I shop more online and also in the physical store. Considering the latent class characteristics (section 5.3.3), it can be stated that consumers that who find product prices less important value product availability and return options significantly more. In addition, they tend to shop more both online and in a physical store. On the other hand, consumers who find product prices more important tend to shop less in both these channels. These consumers also find options to return products and product availability less important. The results of all independent-samples T-tests are presented in annex 14.

Figure 19 Frequency of online shopping (top) and physical shopping (bottom)

5.5 Conclusion

In this chapter, a multinomial logit model and a latent class model were estimated. For each attribute level, the part-worth utility weights (β) were calculated to determine which level is most preferred. In addition, the total attribute range was also evaluated to identify which attribute has the highest importance. Additional chi-square and independent-samples T-tests were conducted to compare the classes in terms of socio-demographic characteristics.

The goodness of fit was calculated using McFadden's Rho-square and was found to be sufficient. For each part-worth utility calculated in the multinomial logit model, the significance was also estimated. The attributes with the highest importance are product price and product availability. In general, the most preferred significant attributes are:
- Buying at the online store and home delivery;
- Available products with no stock information;
- Return at pick-up point for free;
- 5% lower price than average.

Latent class models with a maximum of three classes were estimated. An attempt was also made to estimate one with four classes, but this resulted in a longer estimation process, and eventually the model did not converge. Overall, the latent class model with two classes performed the best, with a McFadden's Rho-square value of $\rho2$ = 0.232. Approximately 74% of all respondents are active shoppers (class I) and 26% are price-conscious shoppers (class II). Product prices are less important for the active shoppers, whereas return possibilities and product availability matter more for them. The price conscious shoppers give higher importance to product price, and they prefer retailers with a 5% lower product price. Other services, such as product availability and return options are less important.

Chi-square tests and independent-samples T-test are used to find significant differences between the latent class models, the socio-demographic variables, and psychographic variables. The active shoppers (class I) are significantly younger than the price-conscious shoppers (class II). It can also be said that the active shoppers find product prices less important and value product availability and return options significantly more. In addition, the active shoppers (class I) also tend to shop more both online and in a physical store. On the other hand, consumers who find product prices more important add less value to product availability and return options.

6 Conclusion and recommendations

This chapter presents the conclusion and recommendations of this thesis. The first section briefly reiterates the research goal, then discusses all results and compares them to the findings in other studies. The second section then presents the managerial implications. Finally, the last section outlines the limitations of the study and possibilities for future research.

6.1 Research results

Knowing how different online and offline channel integration design elements affect customer outcomes can be helpful for retailers to adapt their strategy. At the beginning of this study, the objective and research questions were formed. The research objective of this research was *to gain insight into the added value of online and offline channel integration for consumers and to determine its effect on their choice behavior while shopping with online and offline channel integration.* By gaining information about consumers' preferences, retailers can adjust their strategy for the future. Before the literature review, the following research question was formed: *What is the added value of online and offline channel integration and to what extent does the presence of channel integration influence the choice behavior of consumers when choosing between retailers?*

The data collection was conducted using a questionnaire, which resulted in a dataset with a total of 260 respondents who were willing to cooperate. The first part of the data collection contained the socio-demographic and shopping psychographic characteristics. In the second part, the stated choice method was used to determine the added value of online and offline channel integration options. The literature review served as the foundation for the design of the stated choice experiment. The used attributes were purchase channel, product availability, return options, product price, product range, product information availability, and purchase history.

After the data collection and analysis it was possible to answer the research sub-questions: *"What is the effect of online and offline channel integration on the consumers' preferences for shopping at a retailer with or without channel integration?"* and *"How much do consumers value online and offline channel integration preferences in comparison to other shopping preferences?".*

Socio-demographic characteristics were collected to obtain more information about the research sample. There are many differences among other consumer preference studies' samples: characteristics such as gender, age, level of education and household situation differ among multiple studies that are conducted in the Netherlands (Farag, 2006; Konuş et al., 2008). When compared to the population of the Netherlands, the present study's sample differed in all socio-demographic characteristics. Psychographic characteristics were collected using statements with a 5-point Likert scale. Motivation to conform was the psychographic characteristic with the highest score, followed by shopping enjoyment and price. Little differences in the average scores were found between loyalty, creativeness, and time pressure.

6.1.1 Consumers' shopping preferences
The stated choice experiment contained nine choice situations and was completed by 260 respondents. All results and the exported data were translated into a usable dataset, which is served to estimate the multinomial logit model. The results show that the attribute price was given the overall highest importance, with a lower price than average mostly being preferred. In earlier research, Konuş et al. (2008) found a significant impact of product prices in the category clothing. In addition the higher the price, the more likely a consumer will switch to another retailer (Gensler et al., 2012). Furthermore, information about product availability was

also found to be important in the present study. This is in line with earlier research by Rob (2016). Consumers prefer the certainty that products are available. Not knowing whether an item is available or not leads to dissatisfaction and can result in brand or retailer switching. Consumers are likely to go searching elsewhere for the product they need if products are not available at their first retailer of choice. This was also found in earlier research (Zinn & Liu, 2008). This also explains the visible negative effect that occurs when information about product availability is missing. Besides price and product availability, the channel to buy and receive the product was found to be important too, respondents preferred buying and receiving at the physical store. Regarding additional services, free return options at a pick-up point were preferred over return options that require additional payments. Earlier research has also found that returning products without additional costs is favored the most, and that overall satisfaction with the returning process highly influences customer satisfaction (Mollenkopf et al., 2007; Rob, 2016). The results for the other attributes, such as product range, purchase history, and where the product information is available, were not significant.

In addition to the multinomial logit model, a latent class model was also estimated to find multiple groups or so-called classes with the same shopping preferences. The developed latent class model with two classes showed differences for the following attributes: product price, product availability, and the importance of the purchase channel. Product price showed large differences, and consumers who were less price sensitive attributed higher importance to options to return products and product availability. These so-called active shoppers found product availability crucial. The importance of product availability is also addressed by Bendoly (2005); with product availability failures it is likely that consumers will seek out to other channels or competitors. Furthermore, extra costs, no or complicated return options, and return hassles can have a significant effect on overall customer satisfaction, according to Mollenkopf et al. (2007). On the other hand, the so-called price-conscious shoppers, who found product prices more important, were likely to attribute a lower importance to other store characteristics, such as product availability or return options. These shoppers tended to choose a lower-than-average price. The analysis of the socio demographic characteristics revealed that active shoppers were significantly younger and also tended to shop more both online and in physical stores than price-conscious shoppers did.

6.2 Managerial implications

Multiple managerial recommendations can be given to retailers for them to meet consumers' future demands. All implications apply to retailers that sell apparel. The recommendations mainly concern product availability information, availability of return options, channel transparency, and price transparency.

Consumers appreciate information about the product availability at a retailer; hence, it is recommended that retailers create a clear overview of the current stock and assortment. To attract consumers, both online stores and physical stores need to have their current stock clear and easily visible in multiple channels. If the retailer sells products online and at a physical store, it will be possible to pull consumers to the physical store, if store inventory is visible online. The potential benefits are that consumers can also buy extra products during their store visit. Consumers who often buy apparel also appreciate options to return their order; they prefer easy opportunities to return an order for free at a pick-up point in the neighborhood. The consumer's channel choice can be online or at a physical store; therefore, no channel distinction should be made for the return process. Online and offline retailers benefit from offering free options to return an order at a local pick-up point. These benefits mostly translate into customer satisfaction and higher customer retention. Important to take into account is that additional services such as those mentioned above should not result in additional costs for the consumer. In most situations, a lower price than average is preferred, and it is therefore

necessary to stay competitive in price for products and additional services. The risk of being more expensive than a competing store can lead customers to switch to other retailers.

Based on the results of the latent class model, retailers can follow recommendations specific to target groups to reach a higher performance. Depending on the store strategy and the characteristics of the existing customers, improvements can be made to the strategy. Price-conscious consumers can be triggered mostly by product price, while product availability information is less important to them. Furthermore, they value different options to return products at a low costs. However, these options still matter less than the actual product price. Depending on the strategy and goal of the retailer, it is possible to choose a price-conscious strategy, and product price always needs to be the most important characteristic of all retail strategy decisions. In contrast, active shoppers find information about product availability absolutely crucial. If a retailer offers information about the current stock, it is likely that these active shoppers will choose this retailer instead of competitors. The retailers that offer apparel online can improve by adding stock information next to the items. To attract more customers, physical apparel stores need to create an integrated online channel that presents their stock information. When a physical and an online channel are combined, it is necessary to show the current stock in both channels. Secondly, active shoppers' value additional services such as return options by using a pick-up point. It is not necessary for them to have the lowest price for a product, but they do not want to pay more than average. Eventually, these recommendations could lead to customer satisfaction, retention, and perhaps increased revenue.

6.3 Limitations of the study

The findings of this study provide more insight into consumer preferences for online and offline channel integration; however, there are also some limitations. These limitations lead to opportunities for future research and relate to the used method, variation, and the maximum number of attributes.

This study used the stated choice method to collect data. A disadvantage of this method can be the design of the experiment. The comprehensibility of the attributes can make it difficult to interpret the actual meaning of these attributes. More information was given in the questionnaire. However, it is possible that some attribute levels still needed further explanation. Some respondents indicated that not all situations were clear, and they had difficulties in finishing the experiment. Furthermore, according to Adamowicz et al. (1998), the complexity of choice tasks requires extra attention to prevent issues during the data collection. Examples of attributes that caused confusion in this study are product range, and purchase history. A solution to prevent this would be to better explain the attributes and attribute levels, which would give a clearer and more understandable presentation of the choice sets.

In addition to the complexity of the experiment Adamowicz et al. (1998) also addresses the importance of randomization. With the fractional factorial design, 18 profile combinations were created. In statistical terms, the used attributes in the fractional factorial design were orthogonal and did not correlate (Hensher et al., 2015). However, the research sample comprised a total of 260 respondents, all of whom were from the same customer base. Hence, this research sample was quite small and also from a specific retailer. All profiles were well tested in the stated choice experiment, but the composition of the profiles could have been done better. A larger research sample can create more variation of attribute levels and the opportunity to measure more interaction effects. Future research with a larger sample could yield more insight into these interaction effects and contribute more accurate improvements for retailers.
All in all, the results, implications, and the recommendations presented in this research contribute to strategy improvement for retailers, stores, shopping areas, and future research.

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The added value of **online and offline** channel integration

Paul Heijmans I September 2018

TU/e Technische Universiteit
Eindhoven
University of Technology

The added value of **online and offline** channel integration

Colophon

Eindhoven, September 2018

Eindhoven University of Technology
Faculty of the Built Environment
Real Estate Management & Development

Student
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Graduation committee
Chairman graduation committee: Prof. Dr. T.A. (Theo) Arentze
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Second graduation mentor: Dr. Ing. P.J.H.J. (Peter) van der Waerden

TU/e Technische Universiteit
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Index

1 Attributes and criteria that influence consumers

Criteria in shopping purchase behaviour	(Williams & Slama, 1995)	(Chen-Yu & Seock, 2002)	(Keen et al., 2004)	(Levin et al., 2003)	(Zinn & Liu, 2008)	(J. Park & Stoel, 2005)	(Hsu & Burns, 2002)	(Eun Lee et al., 2014)	(Görsch, 2002)	(Zhang, 2008)	(Grewal & Baker, 1998)	(Gupta et al., 2004)	(Zeithaml, 1988)	(Gehrt et al., 2004)	(Oh et al., 2012)	(Berman et al., 2004)	(Hwang et al., 2006)	(Brynjolfsson et al., 2009)	(Grewal et al., 1998)	(Semeijn et al., 2004)	(Bendoly, 2005)	(Simonson, 1999)	(Beck et al., 2015)	(Y.M. Wang et al., 2016)	(Farag et al., 2007)	(Soopramanien et al., 2007)	(Weltevreden, 2008)	(Schröder 2008)	(Nunes & Cespedes, 2003)	(Verhoef et al., 2007)	(Verhoef et al. 2015)	(Herhausen et al., 2015)	(Chatterjee, 2010)	(Chopra, 2016)	(Morganti et al., 2014)	(Neslin et al., 2006)
Shopping preference criteria																																				
Transaction service																																				
Opening hours from the retailer*			1						1	1	1	1		1										1	1	1	1									
Effort to purchase at the retailer			1							1	1	1		1			1																			
Level of control during purchase																											1									
Ability to touch/try merchandise																																				
Price																																				
Price range*	1	1	1			1	1	1	1	1	1	1			1	1	1	1	1			1	1													
Store promotions (discounts)								1															1	1												
Products																																				
Product range of the retailer*	1									1	1			1	1	1		1	1				1					1								
Quality of the product*		1						1	1	1	1			1	1	1			1	1			1	1												
Product brand (image)						1							1								1	1														
Guaranteed stock at the retailer		1			1									1		1	1				1															
Retailer image																																				
Available product information*	1					1		1		1	1	1			1	1	1							1					1	1	1	1				
Product reviews at the retailer																															1	1				
Store brand (image of retailer)																			1	1			1					1				1				
Familiarity with the retailer																																	1			
Sales assistance/merchandise information																																				

4

2 Questionnaire

Questionnaire in English

Before finishing the thesis for my master at Eindhoven University of Technology I'm studying the added value of an integrated shop experience between online stores and physical stores. With the help of this survey it is possible to find out the added value. The survey is divided into two parts. The first part of the survey contains seven general questions, followed by agree-disagree statements. The second part contains hypothetical shopping alternatives and for each question one of the two alternatives needs to been chosen. This survey is processed completely anonymous. In total the survey should probably take 5 or 10 minutes of your time and each participation would really be appreciated a lot. If you have questions regarding the survey, don't hesitate to contact me or customer service at p.j.m.heijmans@student.tue.nl or info@beenmode.nl.

Thank you in advance.

With kind regards,

Paul Heijmans

Part I

What is your age (in years)?	……………….. years
What is your gender?	Male Female
What is your highest educational degree?	Basisonderwijs V(m)bo, lts, lbo, Domestic school Mavo, (m)ulo Mbo, mts Havo, vwo, hbs Hbo, pabo, hts, heao Wo (master, PhD, promoted)
How does your household situation look like?	One person household Couple without child(ren) Couple with child(ren) Single parent with children Multi-person household without child(ren) Other
What are the first four number of your postcode?	………………….
I go shopping at an online shop for clothes or fashion every?	Never Less than once a year Between 1 or 3 times each year 1 or 2 times each quarter 1 or 2 times each month 1 time each week More than 1 time each week
I go shopping in the physical store for clothes or fashion every?	Never Less than once a year Between 1 or 3 times each year 1 or 2 times each quarter

Statement	Disagree				Agree
I regularly purchase clothing from the new collection or different brands just for a change.	1	2	3	4	5
I am one of those people who always buys new clothing after the launch of the new collection.	1	2	3	4	5
I find it boring to always wear the same the same clothing (or brand) repetitively.	1	2	3	4	5
I like to try new and different items.	1	2	3	4	5
I always have the newest fashion trends.	1	2	3	4	5
I generally do my shopping in the same way.	1	2	3	4	5
The clothing brand is important for me in my purchase decision.	1	2	3	4	5
I generally purchase the same brands.	1	2	3	4	5
The place where I do my shopping is very important to me.	1	2	3	4	5
Wearing designer clothing gives me social status.	1	2	3	4	5
The clothes that I wear identify my role.	1	2	3	4	5
My self-esteem is enhanced by the clothing I wear.	1	2	3	4	5
I like shopping.	1	2	3	4	5
I take my time when I shop.	1	2	3	4	5
I am always busy.	1	2	3	4	5
I usually find myself pressed for time.	1	2	3	4	5
It is important for me to have the best price for clothing.	1	2	3	4	5
I compare the prices of various clothing stores before I make a choice.	1	2	3	4	5
	1 or 2 times each month 1 time each week More than 1 time each week				

Part II

In this part of the survey there are 9 questions. Each question contains a choise situation with two retailers. In each situation you are asked to make a choice which retailer you would prefer. If you do not want to shop at one of the two retailers you can choose 'None of these'. Each question is independent and different so it is important to evaluate every alternative in each question and select the most appealing alternative for you.

Each question contains of two alternative retailers with the varying characteristics. Extra explanation about these characteristics are given below.

Characteristics	Options for each retailer
Channel to buy and receive product	- Online store + home delivery - Online store + pick up point - Physical store + physical store pick up
Product availability	- Unknown - Available, Stock information available - Available. No stock information
Returning product	- Return at pick-up point for free - Return at pick-up point for €3,50 - Arrange return shipment yourself at own costs
Product price	- 5% more expensive than average - 5% cheaper than average - Price the same as average
Product range consists of	- Popular assortment - Niche assortment
Product information available on	- On smartphone app - On website - In catalog
Pruchase history available	- Personal size recommendation and order history - Order history - No order order history available

Below you can see an example of a choice situation that is presented in each question. In each question a choice needs to be made. You are going to buy clothes and try to imagine the situation as well as possible when answering the questions. Think of it as a situation in real world.

	Alternatives		None of these
Characteristics	Retailer 1	Retailer 2	
Place to buy and receive product	Online store + home delivery	Physical store + Physical store pick up	
Product availability	Unknown	Yes, also how many items	
Return product options	Return at pick-up point for free	Return at pick-up point for €3,50	
Product price	5% more expensive than average	5% cheaper than average	
Product range consists of	Deep product range (a lot of items from a single category)	Wide product range (a lot items from multiple category's)	
Information of the product available on	On website	In catalog	
Purchase history	Full personal order history	No order history available	
	O	●	O

Questionnaire in Dutch

Deze enquête volgt naar aanleiding van het afronden van mijn opleiding op de Technische Universiteit Eindhoven. Het doel van dit onderzoek is om inzicht te krijgen in de voorkeuren van consumenten voor verschillende eigenschappen van fysieke en online winkels.

De vragenlijst is opgedeeld in twee delen, waarvan het eerste deel bestaat uit 7 algemene vragen en 18 stellingen. Het tweede deel bestaat uit 9 vragen en in elke vraag wordt een andere winkelsituatie geschetst. Bij elke winkelsituatie wordt u gevraagd om een keuze te maken tussen twee winkeliers die in eigenschappen van elkaar verschillen. De enquête is volledig anoniem en neemt ongeveer 5 tot 10 minuten van uw tijd in beslag.

Als u vragen heeft met betrekking tot de enquête dan heeft u op elke pagina de mogelijkheid om per mail contact met mij op te nemen door te klikken op *'Ik heb een vraag over de enquête'*.

Bij voorbaat bedankt voor uw tijd.

Alvast bedankt voor uw tijd.

Met vriendelijke groet,

Paul Heijmans

p.j.m.heijmans@student.tue.nl

Deel I

1. Wat is uw leeftijd (in jaren)?	……………….. jaar
2. Wat is uw geslacht?	Man Vrouw
3. Wat is uw hoogst behaalde opleiding?	Basisonderwijs V(m)bo, lts, lbo, Huishoudschool Mavo, (m)ulo Mbo, mts Havo, vwo, hbs Hbo, pabo, hts, heao Wo (master, PhD, gepromoveerd)
4. Hoe is uw huishouden samengesteld?	Eenpersoonshuishouden Samenwonend paar zonder kind(eren) Samenwonend paar met kind(eren) Alleenstaande ouder met kind(eren) Meerpersoonshuishouden zonder kind(eren) Anders

5.	Wat zijn de 4 cijfers van uw postcode?	………………….
6.	Hoe vaak winkelt u via een **webwinkel** voor kleding en mode?	Nooit Minder dan een keer per jaar Tussen 1 en 3 keer per jaar 1 of 2 keer per kwartaal 1 of 2 keer per maand 1 keer per week Meer dan 1 keer per week
7.	Hoe vaak winkelt u via een **fysieke winkel** voor kleding en mode?	Nooit Minder dan een keer per jaar Tussen 1 en 3 keer per jaar 1 of 2 keer per kwartaal 1 of 2 keer per maand 1 keer per week Meer dan 1 keer per week

In hoeverre bent u het eens met de volgende stellingen?	Volledig oneens				Volledig eens
Ik koop met regelmaat kleding uit de nieuwe collectie of andere merken voor de afwisseling.	1	2	3	4	5
Ik ben een van die mensen die als eerste kleding koopt nadat de nieuwe collectie verkrijgbaar is.	1	2	3	4	5
Ik vind het saai om telkens dezelfde kleding (of merk) te dragen.	1	2	3	4	5
Ik vind het leuk om nieuwe en verschillende artikelen te proberen.	1	2	3	4	5
Ik volg altijd de nieuwste modetrends.	1	2	3	4	5
Ik winkel altijd op dezelfde manier.	1	2	3	4	5
Het merk van de kleding is belangrijk voor mijn aankoopbeslissing.	1	2	3	4	5
Ik koop meestal dezelfde merken.	1	2	3	4	5
De locatie waar ik ga winkelen vind ik erg belangrijk.	1	2	3	4	5
Het dragen van merkkleding geeft mij een sociale status.	1	2	3	4	5
De kleding die ik draag typeert mijn persoonlijkheid.	1	2	3	4	5
Mijn zelfvertrouwen wordt versterkt door de kleding die ik draag.	1	2	3	4	5
Ik vind winkelen leuk.	1	2	3	4	5
Voor winkelen neem ik alle tijd.	1	2	3	4	5
Ik ben altijd druk.	1	2	3	4	5
Ik heb altijd erg veel haast.	1	2	3	4	5
Ik vind het belangrijk om de beste prijs te betalen voor kleding.	1	2	3	4	5
Ik vergelijk prijzen van verschillende kledingwinkels voor ik een keuze maak.	1	2	3	4	5

Deel II

In dit deel van de enquête presenteren we 9 keer een situatie, waarbij u steeds kunt kiezen uit twee verschillende winkeliers voor het kopen van kleding voor uzelf. In de keuzesituaties variëren we de kenmerken van de winkeliers. We vragen steeds uw voorkeur aan te geven. Wanneer geen van beiden uw voorkeur heeft kunt u ook kiezen voor 'geen voorkeur'. Bij elke vraag moet u zich indenken dat u kleding voor uzelf gaat kopen. In de keuzesituaties variëren we de kenmerken van de winkeliers.

Het gaat om de volgende kenmerken en mogelijkheden per kenmerk: Leest u dit s.v.p. eerst rustig door, zodat de keuzesituaties die u krijgt voor u duidelijk zijn.

Kenmerken	Mogelijkheden per winkelier	Uitleg van de mogelijkheden
Kopen en ontvangen via	- Online webwinkel + thuis bezorgd - Online webwinkel + afhalen pick up point - Fysieke winkel + Meenemen uit winkel	*Dit kenmerk gaat over de verschillende mogelijkheden die de* *winkelier aanbiedt om het artikel te kopen en in ontvangst te* *nemen. Een pick-up point is bijvoorbeeld een PostNL punt.*
Beschikbaarheid artikel	- Niet bekend - Beschikbaar. Voorraad bekend - Beschikbaar. Geen voorraad bekend	*Dit kenmerk gaat over de beschikbaarheid van informatie over de* *verkrijgbaarheid van het artikel of over wat in voorraad is.*
Retourneren	- Gratis inleveren bij Pick-up point - Inleveren bij Pick-up point voor €3.50 - Zelf zorgen dat de aankoop retour gaat	*Verschillende mogelijkheden om het artikel te retourneren - zonder kosten,, met gereduceerde kosten of* *de optie om het zelf te regelen.*
Product prijs	- 5% duurder dan gemiddeld - 5% goedkoper dan gemiddeld - Prijs hetzelfde als gemiddeld	*De prijs van de producten die de winkelier rekent ten opzichte* *van een gemiddelde prijs.*
Product assortiment bestaat uit	- Populair assortiment - Niche assortiment	*Het assortiment dat de winkelier biedt: een populair assortiment* *bevat alleen de meest populaire merken en producten;* *een niche assortiment bevat de populaire en bekende producten,* *maar ook onbekende merken en producten.*
Product informatie beschikbaar	- Op smartphone app - Op website - In catalogus	*De manier waarop de informatie over het product beschikbaar is.*
Aankoopgeschiedenis	- Persoonlijk maatadvies en volledige aankoopgeschiedenis - Alleen aankoopgeschiedenis - Geen aankoopgeschiedenis	*Dit kenmerk geeft aan of de winkelier uw aankoopgeschiedenis* *van eerdere orders bijhoudt en basis daarvan maatadvies levert.*

Hieronder is een voorbeeld te zien van een keuzesituatie, waarbij een keuze gemaakt moet worden. U gaat kleding kopen en probeer tijdens het beantwoorden van de vragen de situatie zo goed mogelijk voor te stellen en na te gaan wat u zou doen als die situatie werkelijkheid was.

	Voorbeeldvraag		
Kenmerken	**Retailer 1**	**Retailer 2**	**None of these**
Kopen en ontvangen via	*Online webwinkel + thuis bezorgd*	*Fysieke winkel + meenemen uit winkel*	
Beschikbaarheid artikel	*Niet bekend*	*Beschikbaar. Voorraad bekend*	
Retourneren	*Gratis inleveren bij pick-up point*	*Zelf zorgen dat aankoop retour gaat*	
Product prijs	*5% duurder dan gemiddeld*	*5% goedkoper dan gemiddeld*	
Product assortiment bestaat uit	*Populair assortiment*	*Niche assortiment*	
Product informatie beschikbaar	*Op website*	*In catalogus*	
Aankoopgeschiedenis	*Persoonlijk maatadvies en volledige aankoopgeschiedenis*	*Geen aankoopgeschiedenis*	
UW KEUZE:	O	●	O

3   Used attributes and coding for the BERG systeem 2.2 (NL)

Attribute	Coding Stated Choice	Level
Kopen en ontvangen via	CHANNEL	• Online store + thuis bezorgd • Online store + pick up point • Fysieke winkel + Meenemen uit winkel
Beschikbaarheid artikel	VOORRAAD	• Niet bekend • Beschikbaar. Voorraad bekend • Beschikbaar. Geen voorraad bekend
Retourneren kan via	RETOUR	• Gratis inleveren bij Pick-up point • Inleveren bij Pick-up point voor €3.50 • Zelf zorgen dat het item retour gaat
Product prijs	PRIJS	• 5% duurder dan gemiddeld • 5% goedkoper dan gemiddeld • Prijs hetzelfde als gemiddeld
Product assortiment bestaat uit	ASSORTIMENT	• Niche assortiment • Populair assortiment
Product informatie beschikbaar	PRODUCTINFO	• In Smartphone app • Op website • In catalogus
Aankoopgeschiedenis	ORDERHISTORIE	• Persoonlijk maatadvies en volledige aankoopgeschiedenis • Alleen aankoopgeschiedenis • Geen aankoopgeschiedenis

4 Fractional Factorial design

Channel1	Voorraad1	Retour1	Prijs1	Assortiment1	Productinfo1	Orderhistorie1
Online webwinkel + thuis bezorgd	Niet bekend	Gratis inleveren bij Pick-up point	5% duurder dan gemiddeld	Populair assortiment	Op smartphone app	Persoonlijk maatadvies en volledige aankoopgeschiedenis
Online webwinkel + thuis bezorgd	Beschikbaar. Geen voorraad bekend	Zelf zorgen dat de aankoop retour gaat	5% goedkoper dan gemiddeld	Populair assortiment	In catalogus	Geen aankoopgeschiedenis
Online webwinkel + afhalen pick up point	Beschikbaar. Voorraad bekend	Zelf zorgen dat de aankoop retour gaat	5% duurder dan gemiddeld	Niche assortiment	In catalogus	Persoonlijk maatadvies en volledige aankoopgeschiedenis
Fysieke winkel + Meenemen uit winkel	Niet bekend	Zelf zorgen dat de aankoop retour gaat	Prijs hetzelfde als gemiddeld	Populair assortiment	Op website	Geen aankoopgeschiedenis
Fysieke winkel + Meenemen uit winkel	Beschikbaar. Geen voorraad bekend	Inleveren bij Pick-up point voor ,Ç¨ 3.50	5% duurder dan gemiddeld	Niche assortiment	Op smartphone app	Geen aankoopgeschiedenis
Online webwinkel + thuis bezorgd	Beschikbaar. Voorraad bekend	Gratis inleveren bij Pick-up point	5% duurder dan gemiddeld	Populair assortiment	Op website	Geen aankoopgeschiedenis
Online webwinkel + afhalen pick up point	Niet bekend	Gratis inleveren bij Pick-up point	Prijs hetzelfde als gemiddeld	Niche assortiment	In catalogus	Geen aankoopgeschiedenis
Online webwinkel + afhalen pick up point	Beschikbaar. Geen voorraad bekend	Zelf zorgen dat de aankoop retour gaat	5% duurder dan gemiddeld	Populair assortiment	Op website	Alleen aankoopgeschiedenis
Fysieke winkel + Meenemen uit winkel	Beschikbaar. Voorraad bekend	Zelf zorgen dat de aankoop retour gaat	Prijs hetzelfde als gemiddeld	Populair assortiment	Op smartphone app	Geen aankoopgeschiedenis

Channel2	Voorraad2	Retour2	Prijs2	Assortiment2	Productinfo2	Orderhistorie2
Online webwinkel + thuis bezorgd	Beschikbaar. Voorraad bekend	Inleveren bij Pick-up point voor ,Ç¨ 3.50	Prijs hetzelfde als gemiddeld	Niche assortiment	Op website	Alleen aankoopgeschiedenis
Online webwinkel + afhalen pick up point	Niet bekend	Inleveren bij Pick-up point voor ,Ç¨ 3.50	5% goedkoper dan gemiddeld	Populair assortiment	Op website	Geen aankoopgeschiedenis
Online webwinkel + afhalen pick up point	Beschikbaar. Geen voorraad bekend	Gratis inleveren bij Pick-up point	Prijs hetzelfde als gemiddeld	Populair assortiment	Op smartphone app	Alleen aankoopgeschiedenis
Fysieke winkel + Meenemen uit winkel	Beschikbaar. Voorraad bekend	Gratis inleveren bij Pick-up point	Prijs hetzelfde als gemiddeld	Populair assortiment	In catalogus	Alleen aankoopgeschiedenis
Online webwinkel + thuis bezorgd	Niet bekend	Zelf zorgen dat de aankoop retour gaat	5% goedkoper dan gemiddeld	Niche assortiment	Op smartphone app	Alleen aankoopgeschiedenis
Online webwinkel + thuis bezorgd	Beschikbaar. Geen voorraad bekend	Inleveren bij Pick-up point voor ,Ç¨ 3.50	Prijs hetzelfde als gemiddeld	Populair assortiment	In catalogus	Persoonlijk maatadvies en volledige aankoopgeschiedenis
Online webwinkel + afhalen pick up point	Beschikbaar. Voorraad bekend	Inleveren bij Pick-up point voor ,Ç¨ 3.50	5% goedkoper dan gemiddeld	Populair assortiment	Op smartphone app	Persoonlijk maatadvies en volledige aankoopgeschiedenis
Fysieke winkel + Meenemen uit winkel	Niet bekend	Inleveren bij Pick-up point voor ,Ç¨ 3.50	5% duurder dan gemiddeld	Populair assortiment	In catalogus	Alleen aankoopgeschiedenis
Fysieke winkel + Meenemen uit winkel	Beschikbaar. Geen voorraad bekend	Gratis inleveren bij Pick-up point	5% goedkoper dan gemiddeld	Niche assortiment	Op website	Persoonlijk maatadvies en volledige aankoopgeschiedenis

5   Socio-demographic data

		Sample (N)	Sample (%)	Dutch population %[1]
Gender	Male	53	19,8%	49,6%
	Female	215	80,2%	50,4%
Age	20 - 29	36	13,4%	16,2%
	30 - 39	55	20,5%	15,4%
	40 - 49	67	25,0%	18,8%
	50 - 59	77	28,7%	19,7%
	60 - 69	27	10,1%	16,7%
	70 >	4	2,2%	16,2%
Household	One person household	39	14,6%	23,7%
	Couple without child(ren)	89	33,2%	35,3%
	Couple with child(ren)	125	46,6%	32,4%
	Single parent with child(ren)	6	2,2%	4,5%
	Multi-person household without child(ren)	8	3,0%	4,1%
	Other	1	0,4%	-
Education	Primary eductation	1	0,4%	14,8%
	V(m)bo, lts, lbo, Huishoudschool	7	2,6%	27,2%
	Mavo, (m)ulo	9	3,4%	
	Havo, vwo, hbs	47	17,5%	
	Mbo, mts	31	11,6%	41,3%
	Hbo, pabo, hts, heao	107	39,9%	26,1%
	Wo (master, PhD, gepromoveerd)	66	24,6%	14,9%
Totaal		268	100%	100%

GENDER

GENDER IN THE NETHERLANDS

20%

80%

50%

50%

■ Male
■ Female

---

[1] All data in this column is from CBS (CBS, 2018)

AGE

2%

13%
21%
25%
29%
10%

AGE IN THE NETHERLANDS

16%
16%
15%
18%
19%
16%

- 20 tot 29
- 30 tot 39
- 40 tot 49
- 50 tot 59
- 60 tot 69
- 70 >
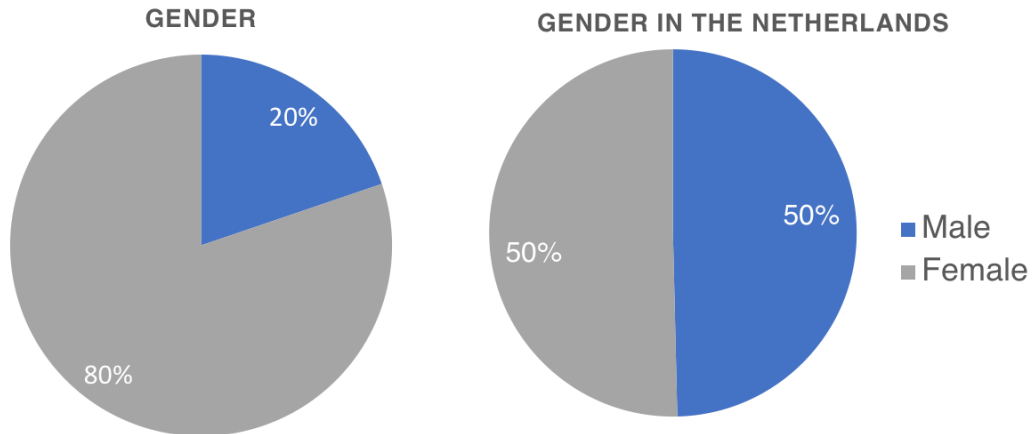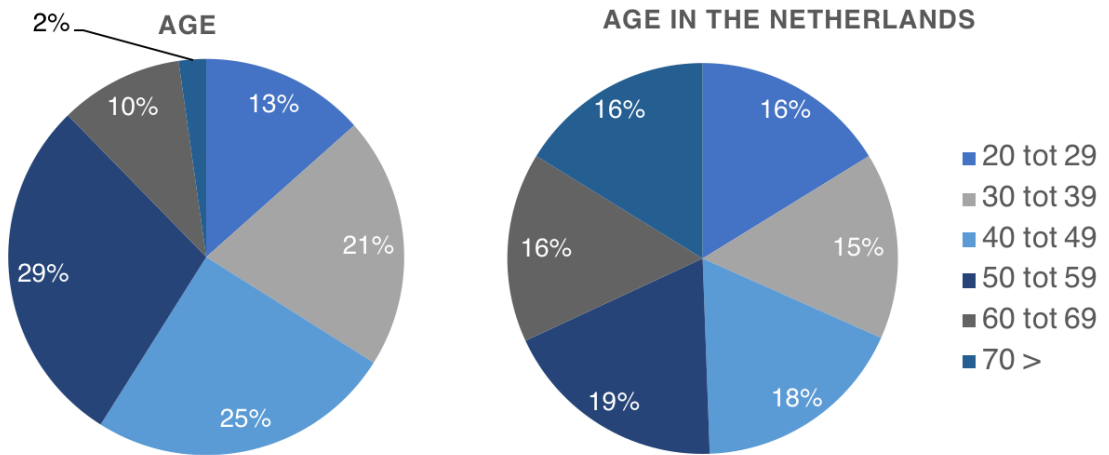
Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Age	0,046	260	,200*	0,981	260	0,002
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Histogram

Mean = 45,53
Std. Dev. = 12,795
N = 260

Frequency / Jaar

HOUSEHOLD SITUATIONS

15%
33%
47%
2% 3%
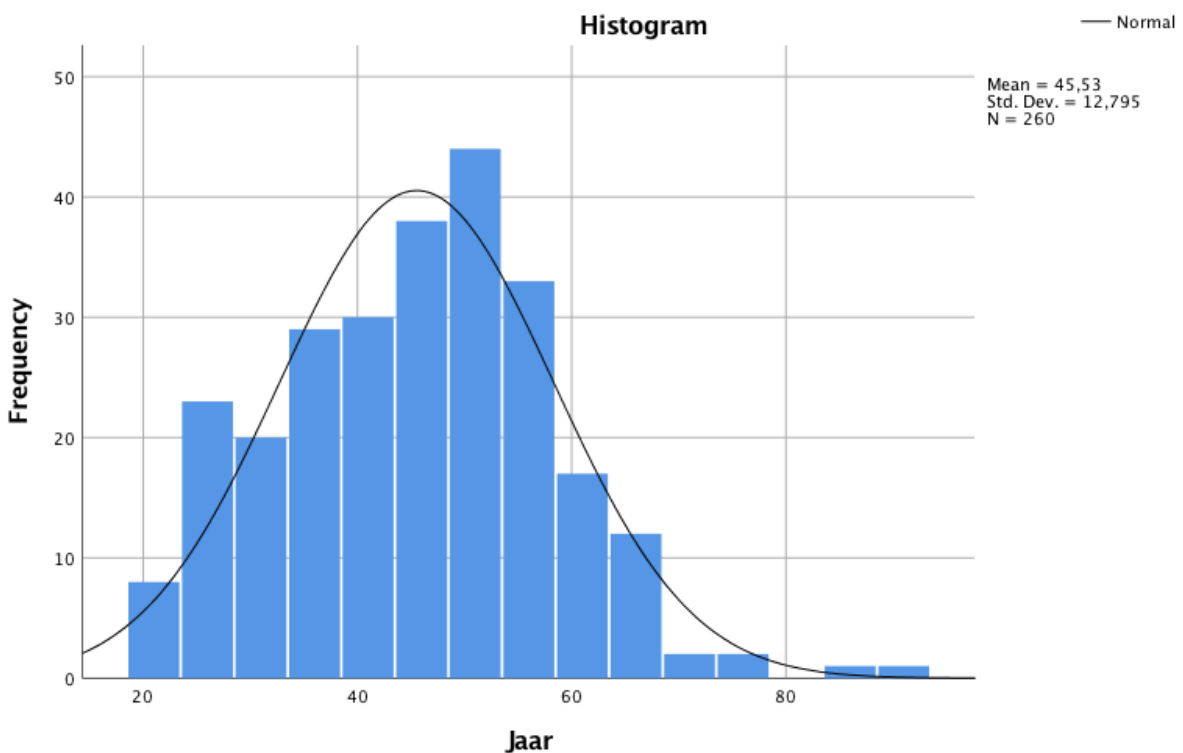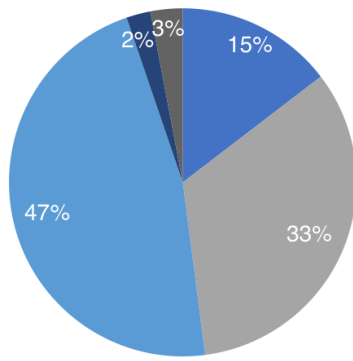
HOUSEHOLD SITUATIONS IN THE NETHERLANDS
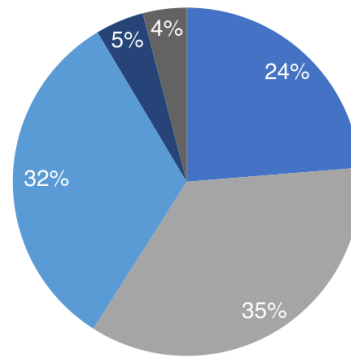
24%
35%
32%
5% 4%

- One person household
- Couple without child(ren)
- Couple with child(ren)
- Single parent with child(ren)
- Multi-person household without child(ren)

LEVEL OF EDUCTATION

Wo (master, PhD, gepromoveerd)

Hbo, pabo, hts, heao

Mbo, mts

Basisonderwijs, V(m)bo, lts,
lbo, huishoudschool,
mavo, (m)ulo, havo, vwo, hbs

0% 5% 10% 15% 20% 25% 30% 35% 40% 45%

- The Netherlands - Respondents

N of respondents per province

25%
1%

Mogelijk gemaakt met Bing
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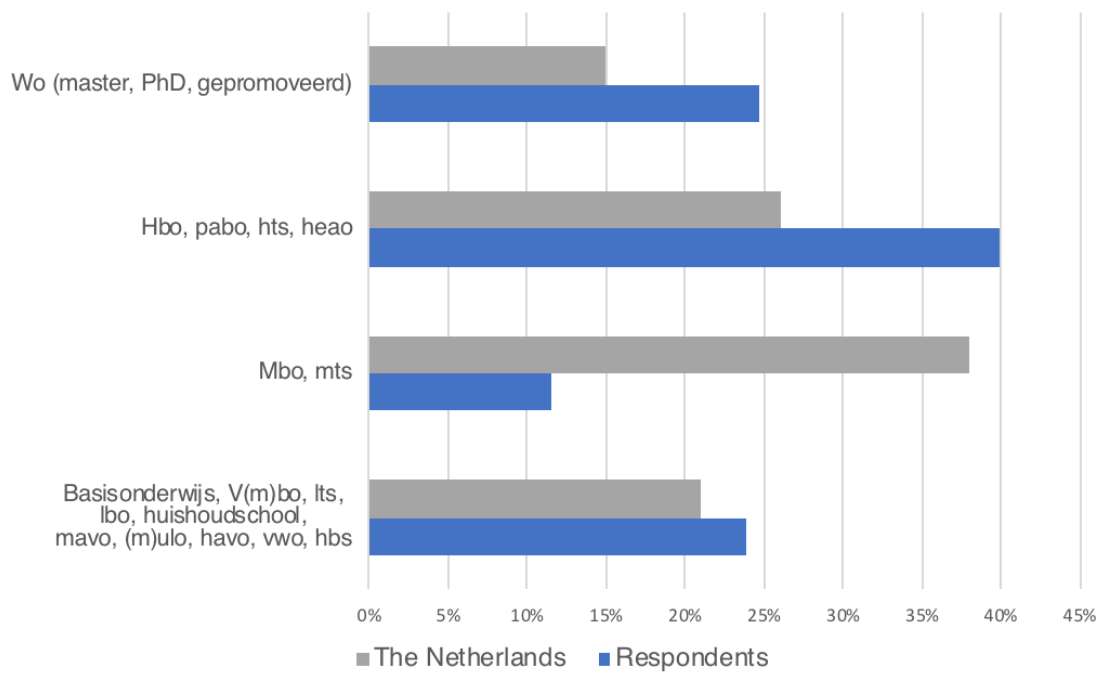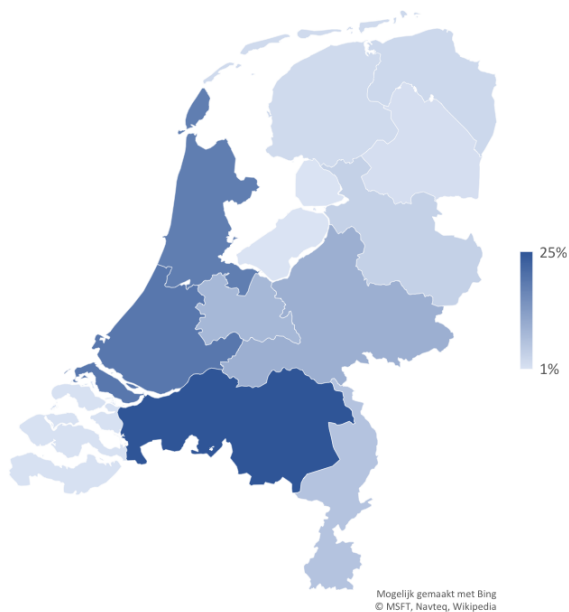
Population of the Netherlands per province

21%
2%

Mogelijk gemaakt met Bing
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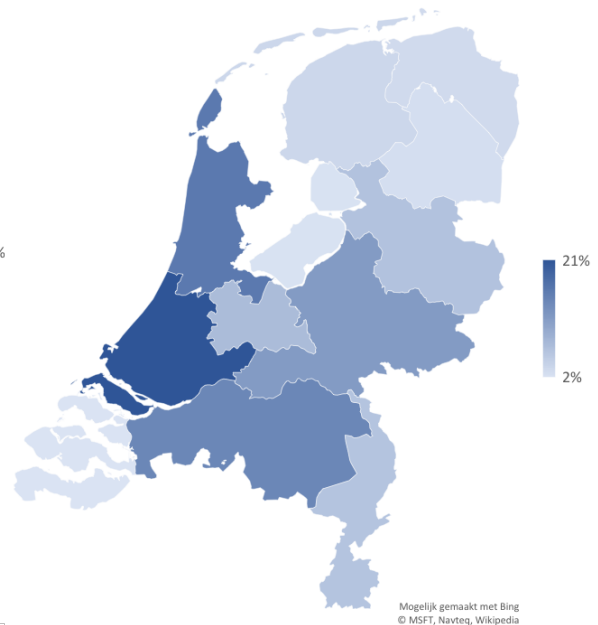
6 Psychographic internal consistency for statements

Reliability Statistics	Cronbach's Alpha Based on Standardized Items	N of Items
Cronbach's Alpha		
0,73	0,74	5

Item-Total Statistics	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Creative	11,66	8,33	0,57	0,35	0,65
Creative_1	12,80	8,74	0,48	0,31	0,69
Creative_2	11,99	9,00	0,37	0,22	0,74
Creative_3	11,32	9,62	0,54	0,31	0,68
Creative_4	12,36	8,85	0,55	0,35	0,66

Reliability Statistics	Cronbach's Alpha Based on Standardized Items	N of Items
Cronbach's Alpha		
0,64	0,66	2

Item-Total Statistics	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Economic	3,04	1,40	0,50	0,25	
Economic_1	3,72	0,71	0,50	0,25	

Reliability Statistics	Cronbach's Alpha Based on Standardized Items	N of Items
Cronbach's Alpha		
0,81	0,82	2

Item-Total Statistics	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Shoppingenjoy	3,05	1,17	0,69	0,47	
Shoppingenjoy_1	3,44	1,47	0,69	0,47	

Reliability Statistics	Cronbach's Alpha Based on Standardized Items	N of Items
Cronbach's Alpha		
0,58	0,57	4

Item-Total Statistics	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Loyal	9,25	6,02	0,20	0,05	0,62
Loyal_1	9,37	4,50	0,50	0,30	0,38
Loyal_2	9,04	4,74	0,47	0,29	0,41
Loyal_3	9,06	5,66	0,28	0,09	0,56

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,48	0,50	3

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Motivationtoconform	7,64	2,24	0,14	0,02	0,67
Motivationtoconform_1	5,93	1,91	0,39	0,26	0,23
Motivationtoconform_2	5,95	2,05	0,41	0,27	0,21

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0,77	0,77	2

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Timepressure	2,67	0,89	0,63	0,40	
Timepressure_1	3,20	1,02	0,63	0,40	

7 Codebook

Nr.	ID	Variable
1	parid	Id respondent from Berg Enquête System 2.2
2	id	Id respondent
3	itaak	Number from choice task
4	alti	Alternative number
5	iset	Id from choiceset that is chosen
6	choice	Choice
7	E0	constant
8	E1	prop.Channel1-1 (dummy)
9	E2	prop.Channel1-2 (dummy)
10	E3	prop.Voorraad1-1 (dummy)
11	E4	prop.Voorraad1-2 (dummy)
12	E5	prop.Retour1-1 (dummy)
13	E6	prop.Retour1-2 (dummy)
14	E7	prop.Prijs1-1 (dummy)
15	E8	prop.Prijs1-2 (dummy)
16	E9	prop.Assortiment1-1 (dummy)
17	E10	prop.Productinfo1-1 (dummy)
18	E11	prop.Productinfo1-2 (dummy)
19	E12	prop.Orderhistorie1-1 (dummy)
20	E13	prop.Orderhistorie1-2 (dummy)
21	Age	Age of respondent
22	Gender	Gender of respondent
23	Education	Education of respondent
24	Household	Household situation of respondent
25	AgeGroup	Age group of respondent
26	G1	Gender of respondent (dummy)
27	O1	Education of respondent (dummy)
28	O2	Education of respondent (dummy)
29	O3	Education of respondent (dummy)
30	O4	Education of respondent (dummy)
31	O5	Education of respondent (dummy)
32	O6	Education of respondent (dummy)
33	H1	Household situation of respondent (dummy)
34	H2	Household situation of respondent (dummy)
35	H3	Household situation of respondent (dummy)
36	H4	Household situation of respondent (dummy)
37	H5	Household situation of respondent (dummy)
38	A1	Age group (dummy)
39	A2	Age group (dummy)
40	A3	Age group (dummy)
41	A4	Age group (dummy)
42	A5	Age group (dummy)

8   Total utility compared with fractional factorial design

	Attibute 1	Attibute 2	Attibute 3	Attibute 4	Attibute 5	Attibute 6	Attibute 7	Total utility
1	Online webwinkel + thuis bezorgd	Niet bekend	Gratis inleveren bij Pick-up point	5% duurder dan gemiddeld	Populair assortiment	Op smartphone app	Persoonlijk maatadvies en volledige	-0,35
Utility	0,23554	-0,39549	0,21507	-0,41587	0,00206	0,00117	0,01036	
2	Online webwinkel + thuis bezorgd	Beschikbaar. Voorraad bekend	Inleveren bij Pick-up point voor €3.50	Prijs hetzelfde als gemiddeld	Niche assortiment	Op website	Alleen aankoopgeschiedenis	0,20
Utility	0,23554	0,14113	-0,24999	0,009	-0,002	-0,06122	0,12787	
3	Online webwinkel + thuis bezorgd	Beschikbaar. Geen voorraad bekend	Zelf zorgen dat de aankoop retour gaat	5% goedkoper dan gemiddeld	Populair assortiment	In catalogus	Geen aankoopgeschiedenis	0,86
Utility	0,23554	0,25436	0,03492	0,40687	0,00206	0,06005	-0,13823	
4	Online webwinkel + afhalen pick up point	Niet bekend	Inleveren bij Pick-up point voor €3.50	5% goedkoper dan gemiddeld	Populair assortiment	Op website	Geen aankoopgeschiedenis	-0,68
Utility	-0,24808	-0,39549	-0,24999	0,40687	0,00206	-0,06122	-0,13823	
5	Online webwinkel + afhalen pick up point	Beschikbaar. Voorraad bekend	Zelf zorgen dat de aankoop retour gaat	5% duurder dan gemiddeld	Niche assortiment	In catalogus	Persoonlijk maatadvies en volledige	0,06
Utility	0,23554	0,14113	0,03492	-0,41587	-0,002	0,06005	0,01036	
6	Online webwinkel + afhalen pick up point	Beschikbaar. Geen voorraad bekend	Gratis inleveren bij Pick-up point	Prijs hetzelfde als gemiddeld	Populair assortiment	Op smartphone app	Alleen aankoopgeschiedenis	0,85
Utility	0,23554	0,25436	0,21507	0,009	0,00206	0,00117	0,12787	
7	Fysieke winkel + Meenemen uit winkel	Niet bekend	Zelf zorgen dat de aankoop retour gaat	Prijs hetzelfde als gemiddeld	Populair assortiment	Op website	Persoonlijk maatadvies en volledige	-0,39
Utility	0,01254	-0,39549	0,03492	0,009	0,00206	-0,06122	0,01036	
8	Fysieke winkel + Meenemen uit winkel	Beschikbaar. Voorraad bekend	Gratis inleveren bij Pick-up point	5% goedkoper dan gemiddeld	Populair assortiment	In catalogus	Alleen aankoopgeschiedenis	0,97
Utility	0,01254	0,14113	0,21507	0,40687	0,00206	0,06005	0,12787	
9	Fysieke winkel + Meenemen uit winkel	Beschikbaar. Geen voorraad bekend	Inleveren bij Pick-up point voor €3.50	5% duurder dan gemiddeld	Niche assortiment	Op smartphone app	Geen aankoopgeschiedenis	-0,54
Utility	0,01254	0,25436	-0,24999	-0,41587	-0,002	0,00117	-0,13823	
10	Online webwinkel + thuis bezorgd	Niet bekend	Zelf zorgen dat de aankoop retour gaat	5% goedkoper dan gemiddeld	Niche assortiment	Op smartphone app	Alleen aankoopgeschiedenis	0,41
Utility	0,23554	-0,39549	0,03492	0,40687	-0,002	0,00117	-0,13823	
11	Online webwinkel + thuis bezorgd	Beschikbaar. Voorraad bekend	Gratis inleveren bij Pick-up point	5% duurder dan gemiddeld	Populair assortiment	Op website	Geen aankoopgeschiedenis	-0,02
Utility	0,23554	0,14113	0,21507	-0,41587	0,00206	0,00117	0,12787	
12	Online webwinkel + thuis bezorgd	Beschikbaar. Geen voorraad bekend	Inleveren bij Pick-up point voor €3.50	Prijs hetzelfde als gemiddeld	Populair assortiment	In catalogus	Persoonlijk maatadvies en volledige	0,32
Utility	0,23554	0,25436	-0,24999	0,009	0,00206	0,06005	0,01036	
13	Online webwinkel + afhalen pick up point	Niet bekend	Gratis inleveren bij Pick-up point	5% duurder dan gemiddeld	Niche assortiment	In catalogus	Geen aankoopgeschiedenis	-0,02
Utility	0,23554	-0,39549	0,21507	-0,41587	-0,002	0,06005	-0,13823	
14	Online webwinkel + afhalen pick up point	Beschikbaar. Voorraad bekend	Inleveren bij Pick-up point voor €3.50	Prijs hetzelfde als gemiddeld	Populair assortiment	Op smartphone app	Persoonlijk maatadvies en volledige	0,55
Utility	0,23554	0,14113	-0,24999	0,009	0,00206	0,00117	0,01036	
15	Online webwinkel + afhalen pick up point	Beschikbaar. Geen voorraad bekend	Zelf zorgen dat de aankoop retour gaat	5% duurder dan gemiddeld	Populair assortiment	Op website	Alleen aankoopgeschiedenis	0,18
Utility	0,23554	0,25436	0,03492	-0,41587	0,00206	-0,06122	0,12787	
16	Fysieke winkel + Meenemen uit winkel	Niet bekend	Inleveren bij Pick-up point voor €3.50	5% duurder dan gemiddeld	Populair assortiment	In catalogus	Alleen aankoopgeschiedenis	-0,86
Utility	0,01254	-0,39549	-0,24999	-0,41587	0,00206	0,06005	0,12787	
17	Fysieke winkel + Meenemen uit winkel	Beschikbaar. Voorraad bekend	Zelf zorgen dat de aankoop retour gaat	Prijs hetzelfde als gemiddeld	Populair assortiment	Op smartphone app	Geen aankoopgeschiedenis	0,06
Utility	0,01254	0,14113	0,03492	0,009	0,00206	0,00117	0,12787	
18	Fysieke winkel + Meenemen uit winkel	Beschikbaar. Geen voorraad bekend	Gratis inleveren bij Pick-up point	5% goedkoper dan gemiddeld	Niche assortiment	Op website	Persoonlijk maatadvies en volledige	0,84
Utility	0,01254	0,25436	0,21507	0,40687	-0,002	-0,06122	0,01036	

9 Mutinominal Logit Model

```
------------------------------------------------------------------------
---
|-> SAMPLE; All $
|-> DISCRETECHOICE;Lhs = choice
    ;Choices = 1,2,3
    ;Rhs      =E0,E1,E2,E3,E4,E5,E6,E7,E8,E9,E10,
             E11,E12,E13$

Normal exit:   6 iterations. Status=0, F=    2096.197

------------------------------------------------------------------------
---
Discrete choice (multinomial logit) model
Dependent variable              Choice
Log likelihood function    -2096.19737
Estimation based on N =   2340, K =  14
Inf.Cr.AIC  =   4220.4 AIC/N =    1.804
Model estimated: Jul 27, 2018, 15:27:32
R2=1-LogL/LogL* Log-L fncn R-sqrd R2Adjfr
Constants only  -2246.2011  .0668 .0640
Response data are given as ind. choices
Number of obs.= 2340, skipped    0 obs
--------
```

CHOICE	Coefficient	Standard Error	z	Prob. |z|>Z*	95% Confidence Interval	
E0	1.31179***	.06893	19.03	.0000	1.17669	1.44689
E1	.23554***	.08138	2.89	.0038	.07604	.39504
E2	-.24808***	.06800	-3.65	.0003	-.38135	-.11480
E3	-.39549***	.04245	-9.32	.0000	-.47869	-.31229
E4	.14113***	.04787	2.95	.0032	.04731	.23494
E5	.21507***	.04758	4.52	.0000	.12181	.30833
E6	-.24999***	.05514	-4.53	.0000	-.35806	-.14193
E7	-.41587***	.06801	-6.12	.0000	-.54916	-.28257
E8	.40687***	.07426	5.48	.0000	.26132	.55242
E9	.00206	.05311	.04	.9690	-.10203	.10615
E10	.00117	.07063	.02	.9868	-.13726	.13960
E11	-.06122	.05144	-1.19	.2340	-.16205	.03961
E12	.01036	.05674	.18	.8551	-.10084	.12156
E13	.12787**	.06195	2.06	.0390	.00645	.24930

```
--------
```

Note: ***, **, * ==> Significance at 1%, 5%, 10% level.

```
------------------------------------------------------------------------
---
```

10 2-Classes Latent Class model

```
|-> SAMPLE; All $

|-> CREATE ; p1 = 0 ; p2 = 0$
|-> NAMELIST ; cp = p1,p2$
|-> DISCRETECHOICE;Lhs = choice
    ;Choices = 1,2,3
    ;Rhs    = E0,E1,E2,E3,E4,E5,E6,E7,E8,E9,E10,
             E11,E12,E13
    ;lcm
    ;classp=cp
    ;pds=9
    ;pts=2
    ;Maxit=200$
Normal exit:  6 iterations. Status=0, F=   2096.197
```

```
------------------------------------------------------------------
---
Discrete choice (multinomial logit) model
Dependent variable          Choice
Log likelihood function    -2096.19737
Estimation based on N =   2340, K =  14
Inf.Cr.AIC  =   4220.4 AIC/N =    1.804
Model estimated: Jul 27, 2018, 16:15:01
R2=1-LogL/LogL* Log-L fncn R-sqrd R2Adj
Constants only  -2246.2011  .0668 .0610
Response data are given as ind. choices
Number of obs.= 2340, skipped    0 obs
--------
```

```
+------------------------------------------------------------------
        |                  Standard         Prob.     95% Confidence
  CHOICE| Coefficient       Error      z    |z|>Z*       Interval
--------
+------------------------------------------------------------------
    E0|1|    1.31179***    .06893   19.03  .0000    1.17669   1.44689
    E1|1|     .23554***    .08138    2.89  .0038     .07604    .39504
    E2|1|    -.24808***    .06800   -3.65  .0003    -.38135   -.11480
    E3|1|    -.39549***    .04245   -9.32  .0000    -.47869   -.31229
    E4|1|     .14113***    .04787    2.95  .0032     .04731    .23494
    E5|1|     .21507***    .04758    4.52  .0000     .12181    .30833
    E6|1|    -.24999***    .05514   -4.53  .0000    -.35806   -.14193
    E7|1|    -.41587***    .06801   -6.12  .0000    -.54916   -.28257
    E8|1|     .40687***    .07426    5.48  .0000     .26132    .55242
    E9|1|     .00206       .05311     .04  .9690    -.10203    .10615
   E10|1|     .00117       .07063     .02  .9868    -.13726    .13960
   E11|1|    -.06122       .05144   -1.19  .2340    -.16205    .03961
   E12|1|     .01036       .05674     .18  .8551    -.10084    .12156
   E13|1|     .12787**     .06195    2.06  .0390     .00645    .24930
--------
+------------------------------------------------------------------
Note: ***, **, * ==>  Significance at 1%, 5%, 10% level.
------------------------------------------------------------------
---
```

```
Line search at iteration   45 does not improve fn. Exiting optimization.
```

```
------------------------------------------------------------------
---
Latent Class Logit Model
Dependent variable           CHOICE
Log likelihood function    -1974.81149
Restricted log likelihood  -2570.75276
Chi squared [  29 d.f.]     1191.88253
Significance level           .00000
McFadden Pseudo R-squared    .2318159
```

```
Estimation based on N =   2340, K =  29
Inf.Cr.AIC  =   4007.6 AIC/N =    1.713
Model estimated: Jul 27, 2018, 16:15:04
R2=1-LogL/LogL* Log-L fncn R-sqrd R2Adj
No coefficients -2570.7528  .2318 .2270
Constants only  -2246.2011  .1208 .1153
At start values -2096.1790  .0579 .0520
Response data are given as ind. choices
Number of latent classes =          2
Average Class Probabilities
     .739  .261
LCM model with panel has     260 groups
Fixed number of obsrvs./group=        9
Number of obs.= 2340, skipped    0 obs
--------
+--------------------------------------------------------------------
        |                 Standard           Prob.      95% Confidence
  CHOICE| Coefficient      Error      z     |z|>Z*       Interval
--------
+--------------------------------------------------------------------
        |Utility parameters in latent class -->> 1
   E0|1|    2.99158***     .31233    9.58    .0000    2.37944   3.60373
   E1|1|     .36757        .26502    1.39    .1655    -.15186    .88700
   E2|1|    -.22735*       .11815   -1.92    .0543    -.45893    .00422
   E3|1|    -.40764***     .06849   -5.95    .0000    -.54187   -.27342
   E4|1|     .10493        .12708     .83    .4090    -.14415    .35401
   E5|1|     .17896        .12765    1.40    .1609    -.07123    .42914
   E6|1|    -.16133        .16734    -.96    .3350    -.48931    .16666
   E7|1|    -.60453***     .21300   -2.84    .0045   -1.02201   -.18705
   E8|1|     .69126***     .24947    2.77    .0056     .20231   1.18021
   E9|1|    -.09903        .16285    -.61    .5431    -.41820    .22014
  E10|1|    -.11370        .21791    -.52    .6018    -.54080    .31339
  E11|1|    -.06517        .11440    -.57    .5689    -.28939    .15905
  E12|1|    -.06662        .17089    -.39    .6967    -.40155    .26831
  E13|1|    -.09817        .18272    -.54    .5911    -.45630    .25996
        |Utility parameters in latent class -->> 2
   E0|2|    -.18829        .13997   -1.35    .1785    -.46262    .08603
   E1|2|     .17736        .12425    1.43    .1535    -.06617    .42089
   E2|2|    -.22993*       .12026   -1.91    .0559    -.46564    .00578
   E3|2|    -.38245***     .10061   -3.80    .0001    -.57965   -.18525
   E4|2|     .17445*       .09572    1.82    .0684    -.01316    .36207
   E5|2|     .26286***     .09466    2.78    .0055     .07733    .44838
   E6|2|    -.28610***     .10552   -2.71    .0067    -.49291   -.07929
   E7|2|    -.46362***     .13223   -3.51    .0005    -.72279   -.20445
   E8|2|     .36431***     .12181    2.99    .0028     .12556    .60306
   E9|2|     .05943        .08336     .71    .4759    -.10396    .22283
  E10|2|    -.01654        .11115    -.15    .8817    -.23438    .20130
  E11|2|     .01926        .09802     .20    .8442    -.17286    .21138
  E12|2|    -.01370        .11124    -.12    .9020    -.23172    .20432
  E13|2|     .09110        .10907     .84    .4036    -.12268    .30487
        |Estimated latent class probabilities
 PrbCls1|    .73920***     .04105   18.01    .0000     .65875    .81965
 PrbCls2|    .26080***     .04105    6.35    .0000     .18035    .34125
--------
+--------------------------------------------------------------------
Note: ***, **, * ==>  Significance at 1%, 5%, 10% level.
--------------------------------------------------------------------------
---
```

11 3 Classes Latent Class Model

```
--------------------------------------------------------------------------------
---

|-> CREATE ; p1 = 0 ; p2 = 0 ; p3 = 0$
|-> NAMELIST ; cp = p1,p2,p3$
|-> DISCRETECHOICE;Lhs = choice
    ;Choices = 1,2,3
    ;Rhs     = E0,E1,E2,E3,E4,E5,E6,E7,E8,E9,E10,
               E11,E12,E13
    ;lcm
    ;classp=cp
    ;pds=9
    ;pts=3
    ;Maxit=200$
Normal exit:  6 iterations. Status=0, F=    2096.197


--------------------------------------------------------------------------------
---
Discrete choice (multinomial logit) model
Dependent variable              Choice
Log likelihood function    -2096.19737
Estimation based on N =   2340, K =  14
Inf.Cr.AIC  =   4220.4 AIC/N =   1.804
Model estimated: Jul-27, 2018, 16:19:28
R2=1-LogL/LogL* Log-L fncn R-sqrd R2Adj
Constants only  -2246.2011  .0668 .0579
Response data are given as ind. choices
Number of obs.= 2340, skipped   0 obs
--------
```

CHOICE	Coefficient	Standard Error	z	Prob. |z|>Z*	95% Confidence Interval	
E0|1|	1.31179***	.06893	19.03	.0000	1.17669	1.44689
E1|1|	.23554***	.08138	2.89	.0038	.07604	.39504
E2|1|	-.24808***	.06800	-3.65	.0003	-.38135	-.11480
E3|1|	-.39549***	.04245	-9.32	.0000	-.47869	-.31229
E4|1|	.14113***	.04787	2.95	.0032	.04731	.23494
E5|1|	.21507***	.04758	4.52	.0000	.12181	.30833
E6|1|	-.24999***	.05514	-4.53	.0000	-.35806	-.14193
E7|1|	-.41587***	.06801	-6.12	.0000	-.54916	-.28257
E8|1|	.40687***	.07426	5.48	.0000	.26132	.55242
E9|1|	.00206	.05311	.04	.9690	-.10203	.10615
E10|1|	.00117	.07063	.02	.9868	-.13726	.13960
E11|1|	-.06122	.05144	-1.19	.2340	-.16205	.03961
E12|1|	.01036	.05674	.18	.8551	-.10084	.12156
E13|1|	.12787**	.06195	2.06	.0390	.00645	.24930

```
--------
```

Note: ***, **, * ==> Significance at 1%, 5%, 10% level.

```
--------------------------------------------------------------------------------
---

Maximum of  200 iterations. Exit iterations with status=1.


--------------------------------------------------------------------------------
---
Latent Class Logit Model
Dependent variable              CHOICE
Log likelihood function    -1948.64337
Restricted log likelihood  -2570.75276
Chi squared [  44 d.f.]     1244.21877
Significance level              .00000
```
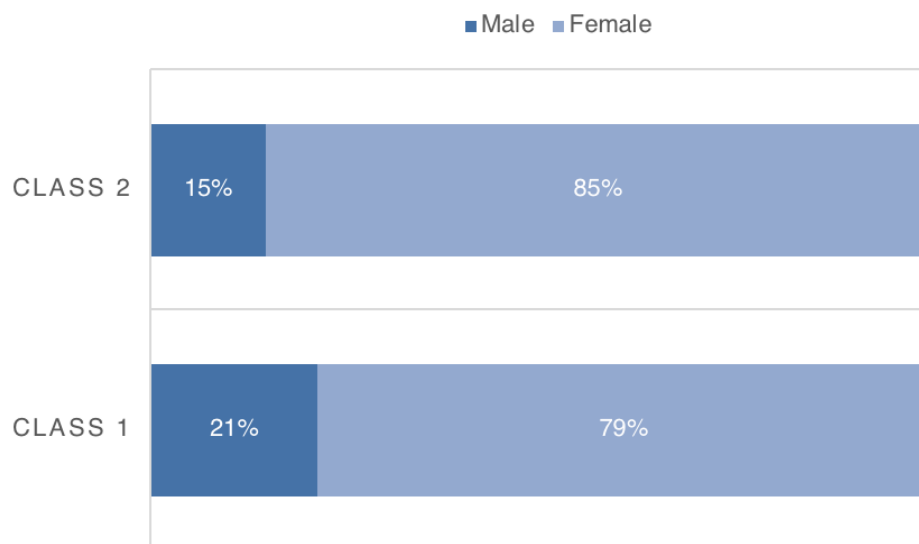
```
McFadden Pseudo R-squared      .2419950
Estimation based on N =   2340, K =   44
Inf.Cr.AIC  =   3985.3 AIC/N =    1.703
Model estimated: Jul 27, 2018, 16:19:58
R2=1-LogL/LogL* Log-L fncn R-sqrd R2Adj
No coefficients -2570.7528  .2420 .2348
Constants only  -2246.2011  .1325 .1242
At start values -2096.2159  .0704 .0616
Response data are given as ind. choices
Number of latent classes =          3
Average Class Probabilities
    .075  .222  .703
LCM model with panel has    260 groups
Fixed number of obsrvs./group=       9
Number of obs.= 2340, skipped   0 obs
--------
```

CHOICE	Coefficient	Standard Error	z	Prob. |z|>Z*	95% Confidence Interval	
Utility parameters in latent class --->> 1						
E0|1	20.8088	117.5675	.18	.8595	-209.6192	251.2368
E1|1	48.8367	537.9439	.09	.9277	-1005.5139	1103.1874
E2|1	-19.0929	121.1496	-.16	.8748	-256.5418	218.3560
E3|1	-4.26688	29.67310	-.14	.8857	-62.42508	53.89132
E4|1	8.71061	149.6379	.06	.9536	-284.57422	301.99544
E5|1	4.39783	59.77034	.07	.9413	-112.74988	121.54555
E6|1	9.88253	177.1333	.06	.9555	-337.29226	357.05732
E7|1	17.7940	197.0231	.09	.9280	-368.3643	403.9523
E8|1	-29.6196	456.7751	-.06	.9483	-924.8823	865.6431
E9|1	-1.66060	206.7044	-.01	.9936	-406.79378	403.47258
E10|1	1.85354	82.88295	.02	.9822	-160.59406	164.30115
E11|1	7.30689	70.54733	.10	.9175	-130.96334	145.57711
E12|1	7.57622	72.53082	.10	.9168	-134.58157	149.73402
E13|1	-7.29143	116.9225	-.06	.9503	-236.45529	221.87244
Utility parameters in latent class --->> 2						
E0|2	-.31716	.19483	-1.63	.1036	-.69903	.06470
E1|2	.12146	.13232	.92	.3587	-.13788	.38081
E2|2	-.29077**	.13138	-2.21	.0269	-.54828	-.03327
E3|2	-.37265***	.11420	-3.26	.0011	-.59648	-.14883
E4|2	.16508	.11676	1.41	.1574	-.06377	.39393
E5|2	.22137*	.11985	1.85	.0647	-.01353	.45628
E6|2	-.26260**	.11617	-2.26	.0238	-.49030	-.03490
E7|2	-.50509***	.15887	-3.18	.0015	-.81646	-.19371
E8|2	.36630**	.14556	2.52	.0119	.08101	.65159
E9|2	.05944	.09424	.63	.5282	-.12525	.24414
E10|2	-.03426	.12531	-.27	.7845	-.27987	.21134
E11|2	.05076	.10888	.47	.6411	-.16264	.26416
E12|2	.00417	.12236	.03	.9728	-.23564	.24399
E13|2	.07378	.11740	.63	.5297	-.15632	.30388
Utility parameters in latent class --->> 3						
E0|3	2.88052***	.39267	7.34	.0000	2.11090	3.65014
E1|3	.05206	.24459	.21	.8314	-.42732	.53144
E2|3	-.26417**	.11880	-2.22	.0262	-.49701	-.03133
E3|3	-.45228***	.07127	-6.35	.0000	-.59197	-.31259
E4|3	.19173	.14115	1.36	.1744	-.08492	.46838
E5|3	.30955**	.14012	2.21	.0272	.03492	.58418
E6|3	-.33817*	.17552	-1.93	.0540	-.68217	.00584
E7|3	-.84448***	.18316	-4.61	.0000	-1.20347	-.48550
E8|3	.79927***	.23342	3.42	.0006	.34177	1.25677
E9|3	-.06603	.14438	-.46	.6474	-.34902	.21696
E10|3	-.06727	.19322	-.35	.7277	-.44597	.31144
E11|3	-.06844	.11208	-.61	.5415	-.28811	.15123
E12|3	.07861	.18295	.43	.6674	-.27996	.43718
E13|3	-.07126	.15401	-.46	.6436	-.37311	.23059
Estimated latent class probabilities						
PrbCls1	.07513***	.02054	3.66	.0003	.03488	.11538
PrbCls2	.22156***	.05129	4.32	.0000	.12104	.32209
PrbCls3	.70330***	.05218	13.48	.0000	.60103	.80558

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Note: ***, **, * ==> Significance at 1%, 5%, 10% level.

12 Chi-square results socio-demographic data

Gender Groups Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6,392[a]	1	0,011		
Continuity Correction[b]	5,698	1	0,017		
Likelihood Ratio	6,475	1	0,011		
Fisher's Exact Test				0,016	0,008
Linear-by-Linear Association	6,368	1	0,012		
N of Valid Cases	260				
a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 32,95.					
b. Computed only for a 2x2 table					

■ Male ■ Female

Education Groups Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7,067[a]	4	0,132
Likelihood Ratio	7,626	4	0,106
Linear-by-Linear Association	4,337	1	0,037
N of Valid Cases	260		
a. 2 cells (20,0%) have expected count less than 5. The minimum expected count is ,26.			

Legend: ■ Primary education ■ Low education ■ Mbo,mts ■ Hbo,pabo,hts,heao ■ Wo (master, PhD, promoted

CLASS 2: % 31% 10% 44% 15%

CLASS 1: % 20% 11% 39% 29%
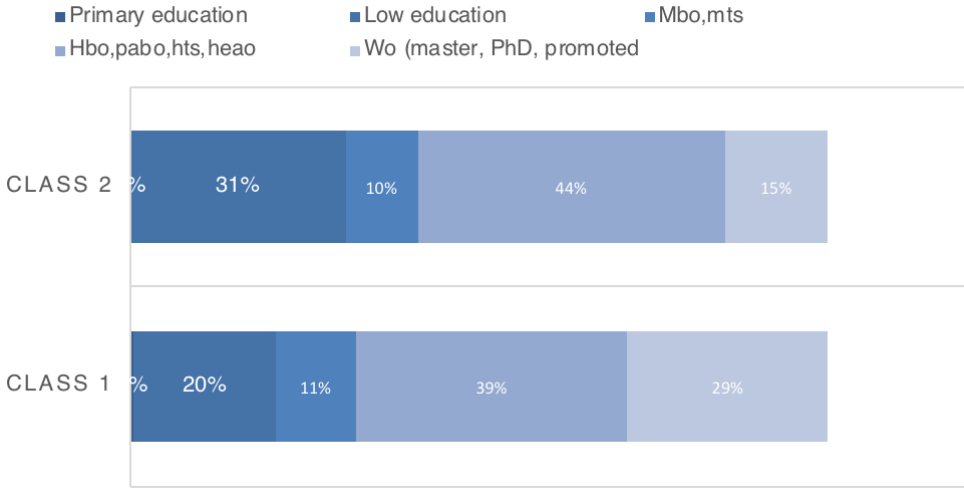
Household Groups Chi-Square Tests					
	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6,392[a]	1	0,011		
Continuity Correction[b]	5,698	1	0,017		
Likelihood Ratio	6,475	1	0,011		
Fisher's Exact Test				0,016	0,008
Linear-by-Linear Association	6,368	1	0,012		
N of Valid Cases	260				
a. 0 cells (,0%) have expected count less than 5. The minimum expected count is 32,95.					
b. Computed only for a 2x2 table					

Household Groups * Class Crosstabulation					
			Class		Total
			Class 1	Class 2	
Household Groups	Houshold with children	Count	90	44	134
		Expected Count	99,0	35,0	134,0
	Houshold without children	Count	102	24	126
		Expected Count	93,0	33,0	126,0
Total		Count	192	68	260
		Expected Count	192,0	68,0	260,0

Household Groups Symmetric Measures			
		Value	Approximate Significance
Nominal by Nominal	Phi	-0,157	0,011
	Cramer's V	0,157	0,011
N of Valid Cases		260	

■Household with children   ■Household without children

CLASS 2: 65% / 35%
CLASS 1: 47% / 53%
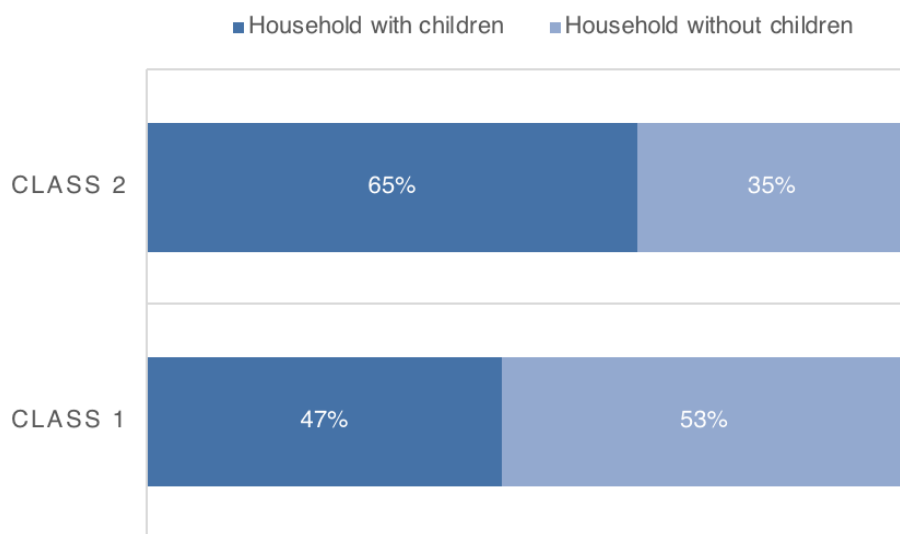
13 Statistic independent T-test results socio-demographic data

Group Statistics		N	Mean	Std. Deviation	Std. Error Mean
Class					
Jaar	Class 1	192	43,47	12,307	0,888
	Class 2	68	50,96	12,789	1,551
Online shoppen	Class 1	192	4,74	1,131	0,082
	Class 2	68	4,40	1,095	0,133
Offline shoppen	Class 1	192	4,21	0,939	0,068
	Class 2	68	3,82	1,064	0,129

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Jaar	Equal variances assumed	0,122	0,727	-4,264	258	0,000	-7,482	1,755	-10,937	-4,027
	Equal variances not assumed			-4,186	113,858	0,000	-7,482	1,787	-11,022	-3,941
Online shoppen	Equal variances assumed	0,027	0,870	2,196	258	0,029	0,348	0,158	0,036	0,660
	Equal variances not assumed			2,231	121,206	0,028	0,348	0,156	0,039	0,656
Offline shoppen	Equal variances assumed	0,321	0,572	2,841	258	0,005	0,390	0,137	0,120	0,660
	Equal variances not assumed			2,676	106,169	0,009	0,390	0,146	0,101	0,679

14 Statistic independent T-test results psychographic data

Variable	Class	Mean	Std, Deviation
Creative	Class I	3,05	0,68
	Class II	2,89	0,82
Loyal	Class I	3,08	0,82
	Class II	3,08	0,82
Motivation to conform	Class I	3,80	0,77
	Class II	3,88	0,68
Shopping Enjoyment	Class I	3,27	1,05
	Class II	3,17	1,06
Time Pressure	Class I	2,98	0,86
	Class II	2,81	0,95
Economic	Class I	3,42	0,90
	Class II	3,27	0,82

Variable	Levene's Test for Equality of Variances			95% Confidence Interval of the Difference	
	F	Sig,	Sig, (2-tailed)	Lower	Upper
Creative	5,06	0,03	0,11	-0,04	0,36
Loyal	0,03	0,87	0,99	-0,23	0,23
Motivation to conform	0,40	0,53	0,49	-0,28	-0,14
Shopping Enjoyment	0,02	0,89	0,50	-0,19	0,39
Time Pressure	2,67	0,10	0,17	-0,07	0,42
Economic	1,42	0,24	0,21	-0,09	0,40

15 Graphs socio-demographic vs. Latent Class Models

Age

Education

Household

Shop online for clothing

Shop in physical store for clothing