"Measuring consumer innovativeness in perspective to their online purchase propensity in two product categories"

Abstract

Marketers are trying to define the online consumer and more specifically what drives their purchase behavior. What are the underlying reasons behind their decision to buy a product online instead of offline? What role does a consumers' self-stated innovativeness have in perspective to their propensity towards online shopping? A convenience sample of 195 respondents show that the four-dimensional Motivated Consumer Innovativeness scale holds in a Dutch sample. Exploratory factor analysis shows the existence of the dimensions functional, cognitive, hedonic and social innovativeness. And unlike existing literature suggests, a consumer's hedonic innovativeness has a positive effect on a consumer's online propensity for utilitarian products. Convenience and safety perceptions seem to have become points of parity and companies should take online shopping to the next level by providing more representational delight. Moreover, older people and women do not have a lower online propensity for hedonic products than younger people and men. Furthermore, there is no reason to assume the online propensity of consumers differs for the product categories utilitarian and hedonic. Further research is needed to discover the difference of product categories on online propensity. Finally, there are also no moderating effects found for the way the four dimensions of innovativeness influence online propensity.

ERASMUS UNIVERSITEIT ROTTERDAM
ERASMUS SCHOOL OF ECONOMICS

Table of contents

1. Introduction

According to the Dutch Central Bureau of Statistics (CBS) 9.3 million Dutch citizens purchased goods or services online in 2010,which is 77% of the Dutch internet users. This is a quick increase in adoption of online shopping as in 2006 only 61% of the Dutch internet users shopped online. With this percentage the Netherlands is among the leaders in Europe with respect to e-shopping. Not only the number of shoppers is increasing, also the amount of money the Dutch citizens spend while shopping online is increasing. Marketingfacts.nl published the figure below on their website. In ten years time the online retail sales have more than quadrupled and they are still increasing despite of the economic downturn the Netherlands is experiencing since 2008.
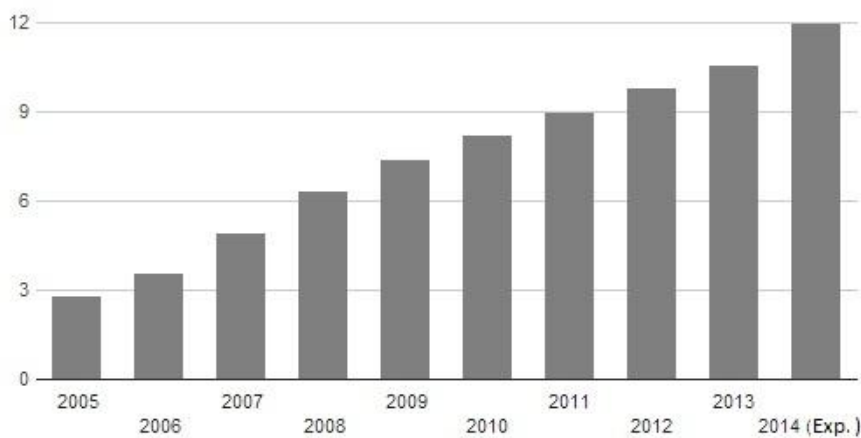
Figure. 1.Dutch online retail sales in billions €, (marketingfacts.nl)

Understanding what drives the online consumer is becoming more and more important, especially because the number of online shops is increasing dramatically as well. It is important to appeal to the consumers to be able to stand the test of time and be profitable in the long run. Although online retail sales are rapidly increasing, traditional offline shopping still amounts to approximately 80% of all retail sales. With 77% of the internet users also doing some amount of shopping online it is safe to say that most consumers are shopping both online as offline. It is interesting for managers to know what a consumers' online propensity and offline propensity is for purchases, because this would make it possible for managers to target consumers with the highest potential of becoming a customer.

Next to online and offline propensity it interesting to research what drives the innovativeness of consumers, because this is valuable information for managers. When they know what drives the innovativeness of consumers they can adjust their marketing campaigns accordingly. Successfully adjusting marketing campaigns to the drivers of innovativeness might lead to quicker adoption of a companies' new product. Quicker adoption of your new product could lead to quicker reaching the breakeven point and could increase profitability of the company.

In this research I am focussing on the effect of the different drivers of consumer innovativeness on a consumers' online and offline purchase propensity. Moreover, the effect of two product categories, utilitarian and hedonic, on online and offline purchase propensity will be measured.

To achieve this, first, an overview of the background of the literature on innovativeness and the differences between online and offline consumers will be given in chapter 2. From this background a theory will be formed and hypotheses will be formulated. In chapter 3 the data will be described. The way the data is collected, the design of the questionnaire and descriptive statistics of the data will be discussed. In chapter 4 the methodology will be discussed and preliminary tests will be performed and discussed, followed by presenting the results and testing of the hypothesis in chapter 5. In chapter 6 the managerial implications will be discussed. Finally, in chapter 7 the conclusions will be discussed as well as the limitations of the research and some suggestions for future research will be given.

2. Literature background and theory development

In this chapter I will discuss the existing literature on the topic and develop my theory. I will start with discussing the research that has been done about innovativeness, after which I will discuss research that has been done about the differences between online and offline consumers.

2.1. Literature background on innovativeness

Midgley and Dowling (1978) were one of the first to summarize existing literature on innovativeness and they have drawn generally accepted conclusions. Their work has been a starting point for most of the following literature. They argue that the fundamental difficulty

of the construct of innovativeness lies in the definition and its measurement. To capture this, two assumptions are made. First, innovativeness is a personality trait possessed by all members of a society and second, what is being measured by studies is this trait. However, they find that the second assumption does not hold, because what is actually being measured is the correlation between the trait and the innovative behavior that is measured. This innovative behavior is influenced by the favorability of the situation, the time and favorability of receiving the communicated information and the interest in the product category. Their construct of innovativeness is the degree to which an individual is receptive to new ideas and make innovative decisions independently of the communicated experience of others.

Hirschman (1980) follows upon the research of Midgley and Dowling (1978) and combines three constructs. The construct of innovativeness is combined with the construct of novelty seeking and the construct of consumer creativity. She actualizes innovativeness into three types: adoptive, vicarious and use innovativeness. Adoptive and vicarious innovativeness are a result of actualized novelty seeking and use innovativeness has a link with consumer creativity. Inherent novelty seeking leads to actualized novelty seeking. Hirschman (1980) is the first to differentiate between the need or want of a consumer to be innovative, actualized novelty seeking. And when it is the only way out, creativity and use innovativeness. Hirschman (1980) argues that especially excellent problem solvers can be seen as creative and belonging to the type use innovativeness.

Goldsmith and Hofacker (1991) were to the best of my knowledge, the first to develop a self-reported multi-item measurement scale for innovativeness. This is interesting, because this way you can find who the innovators are and what their characteristics are. They argue several premises are needed to develop such a measurement scale. Innovators are the first to buy a new product, they are more interested in the product and they have more and are more exposed to knowledge of the product area. Moreover, innovators own more products typifying the product area and are likely to talk to others about the product area.

Goldsmith and Hofacker (1991) argue their scale is most useful for product areas where consumers purchase often and can thus report on their actual or anticipated behavior. They used the music industry for their research, because this was an industry of interest for most of their respondents, which were graduate students.

After the music test, they used the fashion industry and perfume industry and a non-student sample to validate their measurement scale. They find their scale to be reliable and valid, but

it lacks the incorporation of psychometric properties so you will not be able to use the outcomes of the test in general. The measured innovativeness, so they argue, might be too focused on a single product category and thus have to be adapted and performed over and over again for every different product category.

Flynn and Goldsmith (1999) followed up on the previous research by taking into account the influence of knowledge on innovativeness and actual consumer purchase behaviour. They consider three constructs of knowledge. Subjective knowledge, what we think we know. Objective knowledge, what we actually know. And prior experience, a determinant of both subjective knowledge and objective knowledge. Especially subjective knowledge is hard to measure, because people tend to be either overconfident or under confident about their knowledge. Flynn and Goldsmith (1999) find that subjective knowledge has an impact on innovativeness and actual purchase behaviour. The higher the subjective knowledge is, the faster the adoption of new products is.

Agarwal and Prasad (1998) operationalized personal innovativeness in the domain of information technology. They used the theory of diffusion of innovations of Rogers and Shoemaker (1983) as a basis for the operationalization technique. They used their construct to divide the population into innovators and noninnovators. The domain of information technology has changed radically since their research and almost everyone has adopted the world wide web. Moreover, their dividing of the population in innovators and noninnovators is too strict and has been caught up by more recent research. This is not the dividing I would like to use for my own research. Hence, a different operationalization technique is needed.

Steenkamp and Gielens (2003) researched the consumer and market drivers of trial probability of new consumer packaged goods. They distinguish in three sources of variation in consumer trial probability and measure the effect of different variables on consumer trial probability. The three sources of variation in consumer trial probability are within new products across consumers, within new products, over time and across new products. They confirm several hypotheses, which will be discussed shortly. Steenkamp and Gielens (2003) find trial probability is higher among consumers who score higher on dispositional innovativeness and trial probability is lower when consumers are susceptible to normative influence. When looking at the time-variable they find trial probability is positively influenced by recent intensive advertising and recent intensive feature and display promotion.

Steenkamp and Gielens (2003) also look at product characteristics influencing trial probability. Average trial probability is higher when the new product is introduced by a strong brand, supported by heavy average advertising expenditure, heavy average feature and display promotion and when its average distribution coverage is high. A relatively high price negatively influences trial probability. Their research shows the trial probability related to novelty is u-shaped, which means the trial probability is higher for incremental novelties and radical novelties, compared to trial probability for novelties in between.

Steenkamp and Gielens (2003) also look at category differences and their research shows trial probability is higher when the number of brands in the category is lower, competition is less intense, when the category is characterized by impulse buying and the category is less easy to stockpile.

Finally Steenkamp and Gielens (2003) discuss moderating effects. The positive effect of consumer dispositional innovativeness is stronger for more novel products, when average feature and display activity is higher, when the relative price of the new product is higher and when the product is introduced by a strong brand. The effect of consumer dispositional innovativeness is higher in categories characterized by a higher degree of impulse buying. However, the effect is weaker when average advertising expenditure is higher. Their research also shows that the negative effect of a consumer's susceptibility to normative influence intensity on trial probability is stronger for more novel products and weaker when average advertising expenditure is higher.

Vandecasteele and Geuens (2010) include motivation sources of buying innovations to a multi-dimensional innovativeness scale. They define innovative consumer behaviour as the tendency to buy new products in a particular product category soon after they appear in the market and relatively earlier than most consumers.

A multi-motivational consumer innovativeness scale is developed by Vandecasteele and Geuens (2010) which I will use in my own research. They find that consumer innovativeness can be divided in to four types of motivations: functional, hedonic, social and cognitive. For each of the four types they discuss the underlying values and give examples of reasons for buying an innovation.

Functional innovativeness is driven by the functional value of an innovation and examples of reasons for buying the innovation are: usefulness, handiness, compatibility, efficiency, comfort, easy to use, quality and reliability of the product.

Hedonic innovativeness is driven by stimulation, hedonism and emotional value. Examples of

reasons for buying the innovation are: pleasure, fun, sensation, excitement, enjoyment, tension, desire and an escape from the daily round.

Social innovativeness is driven by social value of the product and power of preserving a public image. Examples of reasons for buying the innovation are: being different and unique, status, standing, prestige, distinction, opinion leadership, visibility, demonstrating one's success and a sense of belonging.

Cognitive innovativeness is driven by the values of achievement, mental stimulation and epistemic value. Examples of reasons for buying the innovation are knowledge, information, intelligence, eagerness to learn, logical thinking, insight and understanding.

Vandecasteele and Geuens (2010) discuss that motivations can be intrinsically and extrinsically motivated and positively and negatively reinforced. They discuss that where functional, hedonic and cognitive innovativeness are mainly intrinsically motivated, social innovativeness is mainly extrinsically motivated. Hedonic, social and cognitive innovativeness are positively reinforced whereas functional innovativeness is negatively reinforced.

Finally, Vandecasteele and Geuens (2010) stress that for a person to be truly innovative a high score on only one of the four dimensions is not enough. They disprove the general consensus that older people are always significantly less innovative than younger people and they find that men tend to be more innovative than women.

I will use the four dimensions of innovativeness and the measurement scale as presented by Vandecasteele and Geuens (2010) in my own research and I will test if they will hold in a Dutch sample. Furthermore, I will research how they relate to online and offline propensity for purchases of consumers. In the next part the literature background on online and offline consumers will be discussed.

2.2. Literature background on differences between online and offline consumers

Alba et al. (1997) were one of the first to do research about other types of shopping than retail shopping. They discuss interactive home shopping and acknowledge it is on the rise and has a big potential for both the demand as the supply side. Alba et al. (1997) argue we need to know how to make interactive home shopping successful and how to use its advantages over retail

shopping.

In 1997 consumer catalogs still dominates internet retailers, but most arguments in favor of catalog shopping also hold for online shopping.

Alba et al. (1997) discuss the differences concerning the demand side. Search costs are lower, but overload of information might scare customers away. Consumers need to be able to sort through information efficiently and comparison between products should be easy and reliable for interactive home shopping to be a success.

Alba et al. (1997) also discuss the reason for the supply side to get more involved with interactive home shopping. They stress eroding profits is a concern for companies and also argue no single retail format can dominate all consumer segments because of consumer heterogeneity.

Degeratu et al. (2000) were the first to conduct a large-scale study of online choice behavior using field data. They developed a framework to determine why choices differ between online and offline purchase situations. Using this framework Degeratu et al. (2000) discuss differences between consumer choice behavior in online and traditional supermarkets. Their research shows repurchases are easier for online shoppers. Most online stores save your shopping cart and this makes it easier for customers to remember what they bought and to buy it again.

Degeratu et al. (2000) divide product attributes in sensory and non-sensory product attributes, because this has an impact on shopping behavior of consumers. Sensory product attributes are easier to obtain offline than online and logically their impact on sales is smaller online than offline. Non-sensory product attributes are exactly the opposite, they are easier to obtain online and have a bigger impact online than offline. However, this only holds when what Alba et al. (1997) state about the condition for success is the case. Recall, consumers need to be able to sort through information efficiently and comparison between products should be easy and reliable.

The research of Degeratu et al. (2000) also shows the brand name has more impact on consumer choice behavior when the total amount of information is smaller. Especially when the product contains few sensory attributes. Price also has more impact when the total amount of information is smaller.

Park and Kim (2003) identified key factors which affect consumer purchase behavior in an online shopping context. They found results to support their hypotheses that information

satisfaction and relational benefit influence site commitment. However, they only find a weak link between site commitment and purchase behavior.

Park and Kim (2003) argue user interface quality, product information quality, service information quality and security perception lead to information satisfaction. They also argue that product information quality, service information quality, security perception and site awareness lead to relational benefit. However, without a strong link to purchase behavior it is not very useful for my own research.

Danaher et al. (2003) also compare online and offline purchase behavior. An important factor they also discuss is consumer brand loyalty and how it differs in online and offline purchase situations. Like Degeratu et al. (2000), Danaher et al. (2003) do comparative research on online and offline purchase situations in the grocery sector. Danaher et al. (2003) argue online shoppers select from a smaller consideration set of brands and thereby remain loyal to a smaller number of brand.

Furthermore, their research shows online consumers perceive more risk than offline consumers. One of the main conclusions they draw is that strong brands perform better in an online environment than weak brands, because of the product quality consumers infer from the brand, the reduced level of perceived risk from a well known brand and because repurchase is easier.

Danaher et al. (2003) find that the observed brand loyalty is higher for high market share brands online. Finally Danaher et al. (2003) argue purchase behavior tends to be more conservative online than offline and especially brands, which are well known and have a strong offline presence perform well online. However, this is only researched in the grocery sector and it is not likely that this is transferable to all sectors, because in other categories strong online brands have popped up, without having a strong offline presence, like amazon.com for example.

Rohm and Swaminathan (2004) created a typology of online shoppers based on their motivations to shop and they used the grocery shopping context, similar to the research of Degeratu et al. (2000) and Danaher et al. (2003). They contrasted their result with a matched offline sample. Their empirical findings suggest there are four distinct online grocery shopping types. The four types are convenience shoppers, variety seekers, balanced buyers and store-oriented shoppers. Balanced buyers and store-oriented shoppers were also found in the matched offline sample, but convenience shoppers and variety seekers were different from

the matched offline sample.

Rohm and Swaminathan (2004) argue time saving and recreation and enjoyment as shopping types are not supported in their online study. However, in the offline environment those shopping types emerged as key motivations behind the shopping behavior. They argue the overall shopping convenience construct might subsume the notion of time savings. Finally they argue the use of internet for online shopping might appeal more to functional as opposed to recreational shoppers. This suggestion is something I will look into in my own research.

Kau et al. (2003) have also created a typology of the online shopper. They do not focus solely on the grocery market and use an Asian sample of consumers, unlike Rohm and Swaminathan (2004). By using the principal component method they found six factors which they used to typify consumers on their online attitude and behavior. Those six factors are brand comparison, online shopping, deal proneness, information seeking, ad orientation and offline shopping. Kau et al. (2003) then used a multi-item scale to find different clusters of consumers. They found 6 clusters which they identified as on-off shopper, comparison shopper, traditional shopper, dual shopper, e-laggard and information surfer. I will use the idea behind their online and offline factor analysis for my own research. It should be interesting to see if their typology of online shoppers still hold ten years later and in a Dutch sample.

Cheema and Papatla (2010) focus on the relative importance of online versus offline information for internet purchases in their research. They also test differences for two product categories, utilitarian and hedonic as well as internet experience effects.

The research of Cheema and Papatla (2010) shows relative importance of online information is higher for utilitarian products than for hedonic products. Furthermore, relative importance of online information decreases with increasing consumer internet experience. However, offline information becomes more important. Cheema and Papatla (2010) argue the decreasing of trust of online search engines with more internet experience might be a reason for online information to become less important.

In general, Cheema and Papatla (2010) argue offline information is more important for hedonic products and online information is more important for utilitarian products. This is similar with the findings of Degeratu et al. (2000) that non-sensory attributes are more important online than offline as utilitarian products can be seen as having less sensory attributes than hedonic products. The effect Cheema and Papatla (2010) find with internet experience is not very useful for me, because the majority of my respondents will be

experienced users or even native users of the internet.

Beauchamp and Ponder (2010) argue convenience is one of the core drivers of online shopping. In their research they compare retail convenience for in-store and online shoppers. They define retail convenience as a consumers' time and effort costs associated with shopping in a retail environment.

Beauchamp and Ponder (2010) have found four dimensions of retail convenience: access, search, transactions and possession. All four of those dimensions are higher for online than offline. For possession convenience they find this surprising, because it takes longer for a customer to possess the item after the purchase when purchasing online versus offline. They argue this has to do with the effort a customer has to take to get the product home and this does not weigh up to the time savings benefits of possessing the products immediately. This is especially true when we consider how internet stores have drastically decreased their delivery time. Beauchamp and Ponder (2010) also argue convenience is more important for customers with time-constraints. Online stores can increase success by increasing the convenience experienced by customers.

Jiang et al. (2013) have added a fifth dimension to shopping convenience, evaluation. Retail convenience is important, but not the focus of this research.

Darley et al. (2010) have summarized many of the existing literature on online consumer behavior and decision making process. They argue there is scarcity of literature which is focused on interactions and moderators of online decision makers and suggest that this is a good area for future research. One of the interactors or moderators could be consumer innovativeness, which will be tested in this research. This research will attempt to fill part of the scarcity as proclaimed by Darley et al. (2010). To the best of my knowledge there is little to no research which combines the online consumer behavior with the self-stated innovativeness of consumers. This could be very interesting as more and more innovations are done in an online purchase environment. This research attempt to reveal the relation between innovativeness and online propensity of consumers in two product categories, utilitarian and hedonic. Moreover the effect of gender and age will be tested as this might be underlying variables causing the effect.

2.3. Theory development

In this chapter I will develop my theory and formulate the hypotheses which will be tested in this research.

Vandecasteele and Geuens (2010) developed a measurement scale which will be used as a starting point. It will be interesting to see how the four dimensions of innovativeness (functional, cognitive, hedonic and social) they found influence online and offline propensity for consumers. In the conceptual framework below the expected influences are shown. The dimensions functional innovativeness and cognitive innovativeness are expected to have more influence on consumers with online propensity and the dimensions hedonic innovativeness and social innovativeness are expected to have more influence on consumers with offline propensity.

The propensity for online and offline shopping is used, because no consumer only shops either online or offline. The preferences and likelihood for future purchases however can be very interesting to get insights on for managers. Kau et al. (2003) have created a typology for online shoppers and the measurement scale for online and offline propensity is roughly based on their typology. Many research has been done about the factor internet experience plays in the online shopping behaviour of consumers. However, in this research it is not taken into account, because I use mainly students as respondents and they can all be accounted to be experienced internet users. Furthermore, it was an online survey so it would be hard to reach inexperienced internet users.
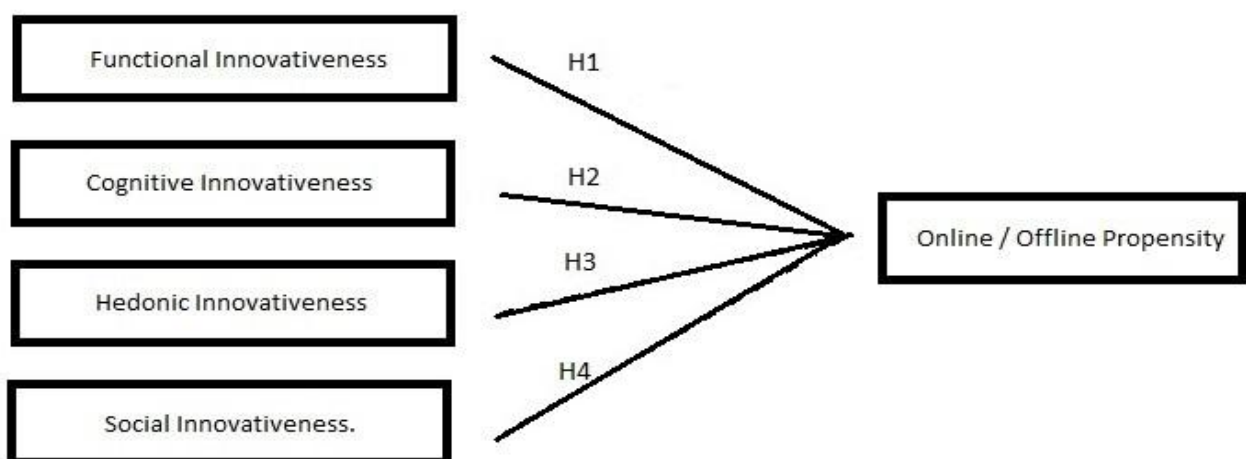

Figure. 2. Conceptual Framework

Degeratu et al. (2000) argue non-sensory product attributes have more influence on the purchase decision in online purchase situations than in offline purchases situations. They also argue sensory product attributes have more influence on the purchase decision in offline

purchase situations than in online purchase situations.

Vandecasteele and Geuens (2010) argue the underlying value of the dimension functional innovativeness is the functional value of the new product. The functional value or functionality of a product can be seen as the non-sensory attributes of the product. Hence, it would make sense for respondents who score high on the dimension functional innovativeness to have a higher value for online propensity than those who score low on the dimension functional innovativeness. The hypothesis is defined as follows:

H1: Respondents who score higher on functional innovativeness score higher on online propensity.

Not only does non-sensory information have more influence on the purchase decision in online purchase situations than in offline purchase situations, also non-sensory information is easier to obtain online than offline (Degeratu et al. 2000). Respondents who score high in the dimension cognitive innovativeness are likely to enjoy mental stimulation and score high on personal attributes as eagerness to learn and logical thinking (Vandecasteele and Geuens 2010). This would make the information more valuable for them and thus you would assume they will score higher on online propensity than those who score low on the dimension cognitive innovativeness. The second hypothesis is defined as follows:

H2: Respondents who score higher on cognitive innovativeness score higher on online propensity.

However, non-sensory attributes are harder to transmit in online purchase situations than in offline purchase situations. As Degeratu et al. (2000) argue emotional value is strongly linked with sensory attributes. The feel or scent of a product has a bigger influence on the emotional value of the product than functional product characteristics. Information about sensory attributes is easier obtained offline than online (Degeratu et al. 2000). Moreover, Cheema and Papatla (2010) argue offline information is more important for hedonic products than functional products. Recreation and enjoyment is an important reason for consumer to go shopping in offline purchase situations. Rohm and Swaminathan (2004) argue this is not the case in online purchase situations. The dimension hedonic innovativeness is strongly linked with the feelings of pleasure of buying something new and the emotional value attached to the product (Vandecasteele and Geuens, 2010). Hence, you would expect respondents who score

high on hedonic innovativeness to score low on the online propensity for buying new products. The third hypothesis is defined as follows.

H3: Respondents who score higher on hedonic innovativeness score lower on online propensity.

As stated earlier, recreation and enjoyment are not supported as drivers of purchases in online purchase situations (Rohm and Swaminathan 2004). Also, online shopping is often performed alone whereas offline shopping is more often performed together with other shoppers. Vandecasteele and Geuens (2010) argue social rewards, status and prestige are examples of reasons to score high on the dimension social innovativeness. Hence, you would expect respondents who score high on the dimension social innovativeness to score low on online propensity. The fourth hypothesis is defined as follows:

H4: Respondents who score higher on social innovativeness score lower on online propensity.

Furthermore, it will be interesting to find how this differs between two different product categories, hedonic and utilitarian. As Cheema and Papatla (2010) argue online information is important for utilitarian products and offline information is important for hedonic products. Availability and usefulness of information are important predictors for purchase behaviour. Therefore, hypothesis 5 is defined as follows:

H5: Respondents have a higher online propensity for utilitarian products than for hedonic products.

The extended conceptual framework in figure 3 on the next page graphically shows all of the expected connections. Dotted lines assume weaker links than regular lines. The signs H1 to H5 represent the hypotheses which test the expected links.
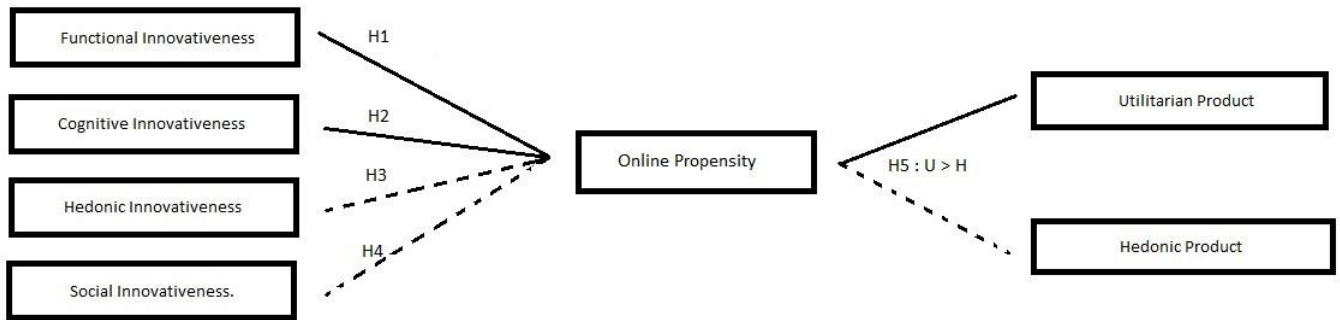
Figure. 3. Extended Conceptual Framework

Online propensity is an abstract concept which cannot be measured without taking into account a product category. Therefore the conceptual framework needs to be adjusted to show the expected relations more clearly.

The adjusted extended framework can be found in figure 4 below.
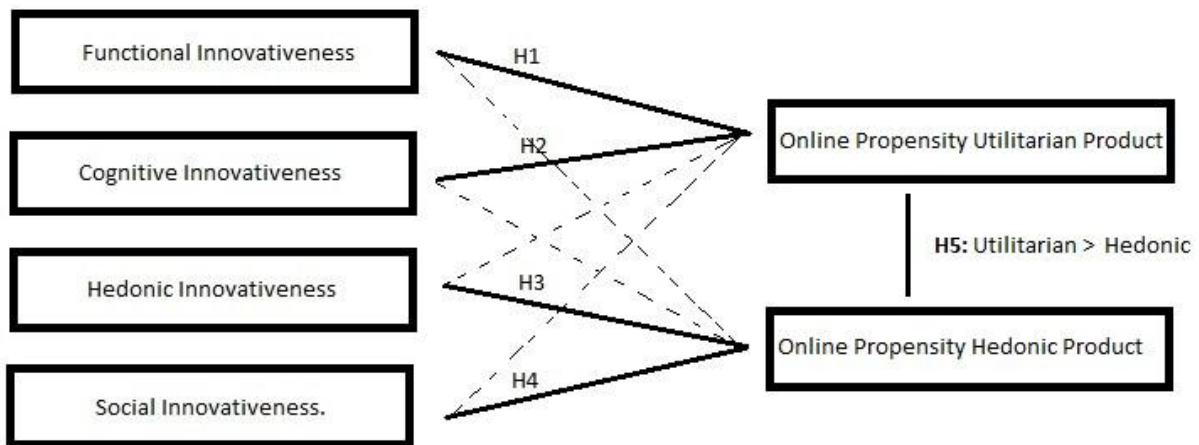
Figure. 4. Adjusted Extended Conceptual Framework

As Vandecasteele and Geuens (2010) indicate a consumers' innovativeness is different for different product categories. However, they do find the four dimensions exist among all product categories they tested. A moderating effect of the product category on the influence of the four dimensions of innovativeness on a consumers' online propensity is expected. Degeratu et al. (2000) argue the difference between sensory and non-sensory product attributes matters for a consumers' likelihood to purchase a product online or offline. Using their reasoning the same could be expected for a consumers' innovativeness. Hedonic and social innovativeness are more about the look and feel of a new product, the sensory product attributes. Functional and cognitive innovativeness are more performance related and could be seen as the non-sensory product attributes. Moreover, it is assumed a utilitarian product

usually has more non-sensory attributes than a hedonic product. Hence, the following hypotheses have been formed to test for the moderating effects as described above:

H6: A consumers' online propensity for a utilitarian product has a moderating effect on the influence a consumers' functional innovativeness has on online propensity.

H7: A consumers' online propensity for a utilitarian product has a moderating effect on the influence a consumers' cognitive innovativeness has on online propensity.

H8: A consumers' online propensity for a hedonic product has a moderating effect on the influence a consumers' hedonic innovativeness has on online propensity.

H9: A consumers' online propensity for a hedonic product has a moderating effect on the influence a consumers' social innovativeness has on online propensity.

The further extended conceptual framework with interactions shown in figure 5 below graphically show those moderating effects.
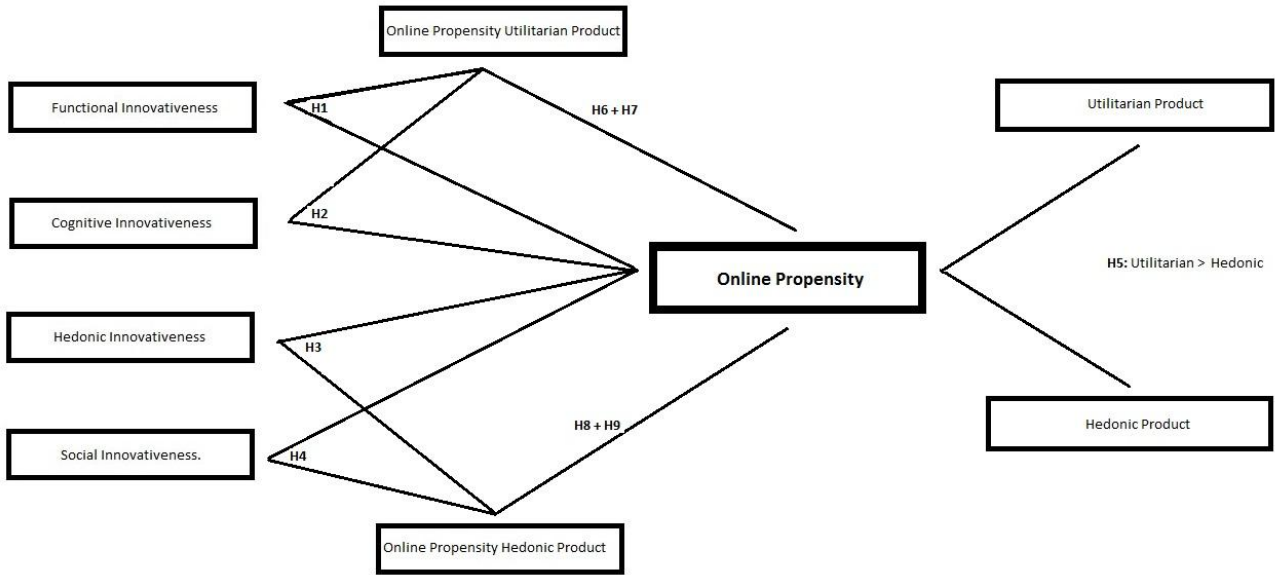
Figure 5. Further Extended Conceptual Framework with Interactions

3. Data description

In this chapter the data will be described. The amount of data, how it was collected and why it was collected in this manner will be discussed. Moreover some descriptive statistics will be presented before the actual analysis will be discussed in chapters 4 and 5.

3.1. Data collection

The data was collected with an online questionnaire (Appendix A) using the qualtrics.com website. My own network (family, friends, colleagues and fellow students) was used to spread the questionnaire and some of them also spread the questionnaire further, a convenience sample. There was no monetary incentive for respondents to participate in the questionnaire, as it was only a short anonymous questionnaire and it was to be expected that most respondents would answer the questionnaire completely and truthfully.

3.2. Questionnaire design

The questionnaire (Appendix A) consisted of 30 questions, with the first twenty questions being measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree). The first twenty questions in the questionnaire represent the multi-dimensional consumer innovativeness scale as constructed by Vandecasteele and Geuens (2010) called Motivated Consumer Innovativeness (MCI). The next eight questions are measured using a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) as well and are used to measure respondents online and offline propensity in two product categories, hedonic and utilitarian. The questions are based on the questions proposed by Kau et al. (2003) which they used to cluster shoppers and provide a typology of online shoppers. The hedonic and utilitarian product category are chosen, because it is easy for respondents to distinguish between the two, so few mistakes will be made which could otherwise cloud the results. Moreover, literature suggests that the preference of purchase for hedonic products tends to be more offline and that the preference of the purchase for utilitarian products tends to be more online (Cheema and Papatla 2010, Degeratu et al. 2000 and Rohm and Swaminathan 2004).

The last two questions are socio-demographic questions (Age and Gender) mainly used to provide a basic lay out of the respondent group and to control for their respective effects. A summary table of the constructs and scales in the questionnaire can be found on the next page in Table 1.

Question	Scale	Type	Subtype
1-5	5-point Likert	Innovativeness	Social Innovativeness
6-10	5-point Likert	Innovativeness	Functional Innovativeness
11-15	5-point Likert	Innovativeness	Hedonic Innovativeness
16-20	5-point Likert	Innovativeness	Cognitive Innovativeness
21-23	5-point Likert	Online/Offline Propensity	Hedonic Product
24-26	5-point Likert	Online/Offline Propensity	Utilitarian Product
27, 28	5-point Likert	Online/Offline Propensity	-
29	Closed Option	Socio-Demographic	Gender
30	Scale	Socio-Demographic	Age

Table 1. Summary Table Questionnaire

3.3. Descriptive statistics

The questionnaire was filled in by 195 respondents of whom 99 (51%) were male. Because 66% of the respondents are 30 years old or younger and because a convenience sample is used it is assumed most respondents are students.

Using the MCI as constructed by Vandecasteele and Geuens (2010) innovativeness scores can be assigned to respondents. With a score between 1 and 5 for each of the four dimensions (social, functional, hedonic and cognitive) and a score between 4 and 20 for MCI. A higher score reflects a higher level of innovativeness. Table 2 below shows the mean and standard deviations of the four dimensions and for MCI as well as the 95% confidence interval of the mean which is calculated using a One-Sample t-test. The average respondent is not very innovative as it only scores 10,5 on a scale between 4 and 20. Furthermore, it shows the respondents on average score lower on social and cognitive innovativeness than on functional and hedonic innovativeness. However, it is only a small difference and the standard deviation of 0,8 shows there are respondents who are innovative on each of the different dimensions and also there are respondents who are not innovative at all on each of the different dimensions.

Item	Mean	Standard Deviation	95% Confidence Interval		Sig. (2-tailed)
			Left bound	Right bound	
Social Innovativeness	**2,3**	**0,81**	**2,16**	**2,39**	**0,00**
Functional Innovativeness	**2,8**	**0,77**	**2,64**	**2,86**	**0,00**
Hedonic Innovativeness	**3,0**	**0,83**	**2,92**	**3,16**	**0,00**
Cognitive Innovativeness	**2,5**	**0,79**	**2,35**	**2,57**	**0,00**
Total Innovativeness	**10,5**	**2,47**	**10,18**	**10,88**	**0,00**

Table 2. Motivated Consumer Innovativeness

In paragraph 4.4.2. till 4.4.4 can be found how the parameter online propensity is constructed and why the parameter is divided into two separate parameters. These parameters are online propensity utilitarian product and online propensity hedonic product.

In table 3 below an overview of the descriptive statistics is shown. Both parameters for online propensity could range from a minimum of 2 to a maximum of 10. The means of both parameters are below the neutral score of 6. This is interesting because this means consumers on average are not likely to shop online. The majority still prefers the traditional way of shopping over online shopping. Moreover, the descriptive give some support to hypothesis 5, because the mean of online propensity utilitarian product is higher than the mean of online propensity hedonic product. However, further testing is necessary before conclusions can be drawn.

Item	Mean	Standard Deviation	95% Confidence Interval		Sig. (2-tailed)
			Left bound	Right bound	
Online Propensity Utiliarian Product	5,20	1,78	4,95	5,45	0,00
Online Propensity Hedonic Product	4,82	1,70	4,58	5,10	0,00

Table 3. Online Propensity

4. Methodology

In this chapter the methodology will be thoroughly discussed as well as the reasoning behind it. Furthermore, preliminary results will be discussed before the actual testing of hypotheses in the next chapter.

4.1. Research method

The research method which is used is quantitative data analysis. Firstly, the parameters need to be established and secondly, the relationships between those parameters will be tested based on the hypotheses formed in paragraph 2.3.

I have chosen to use quantitative data analysis over qualitative data analysis to be able to easier relate my findings to the literature and to be able to learn about the statistical significance of the relationships. Qualitative data analysis is more useful when there is less knowledge and literature about the expected relationships and is more exploratory than quantitative data analysis. The hypotheses formed in paragraph 2.3. have enough foundation in the existing literature for quantitative data analysis to be justified.

4.2. Sampling method

In this paragraph the sampling method will be discussed. I have chosen to use a convenience sample (Moore et al. 2003) for my research. As Moore et al. (2003) argue, when using a convenience sample it is almost guaranteed not to represent the entire population and a bias or systematic error is more likely than when using a random sample. However, due to lack of funds and time this method of sampling has been chosen. Therefore, caution is required when drawing conclusions and discussing managerial implications as the answers of the respondents may not reflect the preferences of the entire population.

The convenience sample in this case means I have used the qualtrics website to distribute my survey and used my own network. This is likely biased towards students and high-educated respondents.

How big the sample size should be also needs to be considered. As Moore et al. (2003), Field (2005) and Janssens et al. (2008) argue a larger sample size leads to a higher reliability and more significant results. However, a larger sample size also is more expensive and more difficult to obtain. There are several rules of thumb to help researchers decide upon the sample size. 30 respondents per independent variable for example. My research consists of six independent variables (functional innovativeness, cognitive innovativeness, hedonic innovativeness, social innovativeness, age and gender). Hence, for this research 180 (6 x 30) respondents are required.

4.3. Testing method

In this paragraph the testing method will be discussed. How to test each of the nine hypothesis will be elaborated upon, as well as which statistical methods and parameters will be used. Firstly, the parameters as shown in the extended conceptual framework (figure 3) need to be defined.

A factor analysis will be used to define the four dimensions of innovativeness as proposed by Vandecasteele and Geuens (2010). After the factors have been identified a reliability analysis will be performed on each of the factors. For defining online and offline propensity and differentiating between the two product types a factor analysis will also be used, and a reliability analysis will be performed.

For testing of the first four hypotheses correlation tests will be performed between the dimensions of innovativeness and online and offline propensity. However, before performing the correlation tests the skewness and the kurtosis of the data will be tested to see whether a

parametric (Pearson) or non-parametric (Spearman) test is required.

It is expected that functional and cognitive innovativeness correlate with online propensity and hedonic and social innovativeness correlate with offline propensity. Moreover, a linear regression analysis will be performed to see if the four dimensions of innovativeness influence a consumers online propensity for utilitarian and hedonic products.

For testing of the other five hypothesis (H5 - H9) another regression model will need to be constructed. Online propensity will have to be constructed by stacking online propensity for utilitarian products and online propensity for hedonic products. Moreover, a dummy for the product category will be created to test the main effect of the product category (H5) and the interaction effects with the four dimensions of innovativeness (H6 - H9).

4.4. Preliminary tests

Before testing the actual hypothesis some preliminary tests are needed. I have decided to perform an exploratory factor analysis on the first twenty measurement items. Moreover, I have performed an exploratory factor analysis on measurement item 21-28 to define the parameter Online / Offline Propensity.

4.4.1. Factor analysis on innovativeness

Although the four dimensions of innovativeness, functional, cognitive, hedonic and social, are defined a priori this tests gives a good insight whether the measurement scale as provided by Vandecasteele and Geuens (2010) also holds in a Dutch sample. Furthermore, it gives an indication of the reliability of the data.

As Janssens et al. (2008) indicate, exploratory factor analysis is useful when you would like to reduce the number of variables by identifying correlations between those variables. This way, underlying similarities between variables are revealed. The most common exploratory factor analysis is the Principal Components Analysis (PCA) with varimax rotation and this will also be the one which is used in this research.

According to Janssens et al. (2008) first, three assumptions need to be satisfied in order for a factor analysis to be meaningful. The first assumption is about the measurement level of the variables, which should be interval or ratio. Under the assumption of equal appearing intervals of the five-point Likert scale as used in this questionnaire (Appendix A), the first assumption is met as the data can be classified as interval. The second assumption which needs to be

satisfied is about the measurement levels of the different variables, which needs to be identical. As can be seen in the questionnaire (Appendix A), this is the case. The third and last assumption that needs to be satisfied is the need for a sufficient number of respondents in the dataset. A rule of thumb indicates the number of respondents should be at least ten times the number of variables. With twenty variables and 195 respondents this assumption is almost satisfied but it lacks five respondents to be completely satisfied. However, no problem is expected because the measurement scale has already been validated by Vandecasteele and Geuens (2010).

Secondly, Janssens et al. (2008) recommend to look at the "Bartlett's test of sphericity" and "Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA)" to check if the data and variables are suitable for a factor analysis. Table 4 below shows the results of the KMO and Bartlett's test.

Kaiser-Meyer-Olkin measure of sampling adequacy		0,901
Bartlett's test of sphericity	Sign.	0,000

Table 4. KMO and Bartlett's Test Innovativeness

Janssens et al. (2008) indicate that the null hypothesis of Bartlett's test of sphericity, the variables are uncorrelated, should be rejected for a factor analysis to be useful. With a significance level of 0,000 the null hypothesis should be rejected. Therefore, the variables are not uncorrelated. Janssens et al. (2008) indicate the global MSA value as well as the individual MSA values, which can be found in Appendix B.2, should be over 0,5. The global MSA value is 0,901. The lowest individual MSA value is 0,846. All values are acceptable. Hence, a factor analysis may be performed.
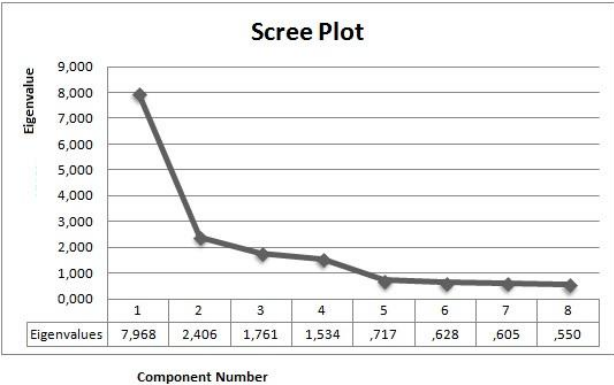

Figure. 6. Scree Plot Innovativeness

According to Janssens et al. (2008) there are two criterions a researcher can use to determine the number of factors underlying a set of variables: the location of the elbow in the "Scree plot" and the " Kaiser criterion". Both only provide an indication, but together with your a priori expectations can give a powerful insight. The "Scree plot" gives an insight in where an extra factor does not result in a big increase in explaining the variance. The "Kaiser criterion" only looks at the Eigenvalues of the factors and the criterion is met for factors which have Eigenvalues bigger than one. The "Scree plot" is shown in figure 6 on the previous page and the Eigenvalues can be found in the table below the "Scree plot" as well as in Appendix B.3.

The "Scree plot" on the previous page suggests that the elbow is at component two. However, when we look at the Eigenvalues the first four components have Eigenvalues bigger than one. The questionnaire (Appendix A) and the research of Vandecasteele and Geuens (2010) indicates four components are relevant. Those four components together explain 68% of the variance, see Appendix B.3.

Next, for each of the variables needs to be decided to which component they belong or if they should not be taken into account. The rotated component matrix is used which can be found in table 5 below. For each of the variables the significant factor loadings have been highlighted.

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
Cognitive_In_4	,877	,107	,192	,189
Cognitive_In_3	,820	,254	,130	,145
Cognitive_In_5	,792	,168	,225	,214
Cognitive_In_2	,731	,071	,199	,300
Cognitive_In_1	,637	,406	,112	,096
Hedonic_In_5	,282	,775	,142	,131
Hedonic_In_2	,064	,761	,169	,123
Hedonic_In_3	,207	,752	,206	,201
Hedonic_In_4	,264	,735	,168	,254
Hedonic_In_1	,094	,687	,319	,233
Social_In_4	,142	,124	,809	,081
Social_In_5	,160	,005	,802	,089
Social_In_3	,241	,245	,770	,078
Social_In_1	,183	,311	,760	,046
Social_In_2	,072	,354	,747	,097
Functional_In_2	,183	,030	,069	,830
Functional_In_3	,216	,106	,051	,808
Functional_In_5	,137	,197	,098	,737
Functional_In_4	,180	,242	,167	,714
Functional_In_1	,085	,223	,008	,645

Extraction Method: Principal Component Analysis.

a. Rotation converged in 6 iterations.

Table 5. Rotated Component Matrix

According to Janssens et al. (2008) factor loadings are statistically significant (at the 0,05 level) when bigger than 0,40 for a sample size of 200 and 0,45 for a sample size of 150. The current sample, 195 respondents, lies close to 200. However, for the factor loadings to be practically significant they need to be bigger than 0,50. Moreover a variable can only load on one variable to be practically significant. All loadings that are bigger than 0,40 have been highlighted in table 5 above. All variables load as a priori expected except for Cognitive_In_1, which seems to load on two components, with a factor loading of 0,637 for component 1, which is Cognitive Innovativeness and a factor loading of 0,406 for component 2, which is Hedonic Innovativeness. Variable Cognitive_In_1 corresponds with question 16 from the questionnaire (Appendix A). "I mostly buy those innovations that satisfy my analytical mind". It needs to be considered whether or not the variable needs to be eliminated. Firstly, there can be discussion about what the significant factor loading is for a sample size of 195, because it lies somewhere between 0,40 and 0,45. However, this discussion is not very interesting as the four dimensions and the variables of which they are build up are assumed a priori. However, from a more practical point of view it interesting to consider what might have caused this variable to also load on the dimension Hedonic Innovativeness. When looking at the descriptive statistics and the fact that a convenience sample has been used it cannot be ignored that 66% of the respondents is under the age of 30 and most likely a student. It could be that satisfying the analytical mind as proposed in question 16 is perceived as fun and thus also loads on the dimension Hedonic Innovativeness. Because the factor loading of the variable is not practically significant, smaller than 0,50, and still loads 0,637 on the dimension cognitive innovativeness and those dimensions are assumed a priori I have not eliminated the variable.

Dimension	Cronbach's Alpha	Dimension	Cronbach's Alpha	Dimension	Cronbach's Alpha	Dimension	Cronbach's Alpha
Functional	0,846	Cognitive	0,895	Hedonic	0,877	Social	0,88
Variable	**If deleted**	**Variable**	**If deleted**	**Variable**	**If deleted**	**Variable**	**If deleted**
Functional_In_1	0,846	Cognitive_In_1	0,899	Hedonic_In_1	0,86	Social_In_1	0,844
Functional_In_2	0,798	Cognitive_In_2	0,882	Hedonic_In_2	0,864	Social_In_2	0,852
Functional_In_3	0,797	Cognitive_In_3	0,861	Hedonic_In_3	0,842	Social_In_3	0,846
Functional_In_4	0,814	Cognitive_In_4	0,849	Hedonic_In_4	0,842	Social_In_4	0,858
Functional_In_5	0,816	Cognitive_In_5	0,864	Hedonic_In_5	0,845	Social_In_5	0,869

Table 6. Reliability Analyses Innovativeness

Before summating and transforming the twenty variables into the four dimensions, a reliability analysis needs to be performed for each of the four dimensions by the calculation of

"Cronbach's Alpha". Table 6 on the previous page gives an overview of all the calculated "Cronbach's Alpha's". According to Janssens et al. (2008) a dimension should consist of at least three items and a "Cronbach's Alpha" larger than 0,80 should be considered as very good. Hence. elimination of items with the purpose to increase Alpha is not necessary and the summated scale can be calculated immediately.

When we look at the columns "if deleted" in table 6 we can see that an increase in Alpha can only be accomplished by deleting Cognitive_In_1 in the dimension Cognitive Innovativeness. However, it is only a slight increase and as stated before the value for "Cronbach's Alpha" can already be considered to be very good. The four reliability tests can be found in Appendix B.4. Appendix B.4. also show the corrected item-total correlation scores of the four dimensions. Field (2005) indicate that those scores should be larger than 0,3 to give an indication that the variable do not pose problems. All corrected item-total correlation scores match this criterion.

The last step in dimension reduction with a principal component factor analysis is computing the new variables. Janssens et al. (2008) indicates that a way to do this is to use a weighted summation of the different variables by using the weights indicated in the component score coefficient matrix shown in Appendix B.5. I have decided not to use these weights, but assign equal weights to the variables composing the dimensions, because they are assumed a priori based on the research of Vandecasteele and Geuens (2010). The descriptive statistics of the four dimensions can be found in Table 1 in paragraph 3.3. Descriptive Statistics.

Moreover, it is interesting to look at the correlations between the four dimensions. Some positive correlations is expected as they all test the parameter innovativeness in the same direction. However, when the correlation is too high it does not make sense to differentiate between the four dimensions. The correlations can be found in table 7 below. All correlations are significant at $p < 0,01$.

Pearson Correlations	Social Innovativeness	Functional Innovativeness	Hedonic Innovativeness	Cognitive Innovativeness
Social Innovativeness	1	0,278	0,529	0,453
Functional Innovativeness		1	0,465	0,47
Hedonic Innovativeness			1	0,521
Cognitive Innovativeness				1

Table 7. Correlations between the dimensions of innovativeness

As can be seen in Table 7 on the previous page all dimensions positively correlate with one another. The correlation between functional innovativeness and social innovativeness is lower than expected, especially because all other correlations are around 0,5. The biggest variance can be measured using those two dimensions. The correlations which are found present a medium effect (Janssens et al. 2008), except for the one mentioned above, and thus does not give reason for concern. Combining two dimensions would not make sense as the correlations is a lot lower than between the variables of the dimension.

4.4.2. Defining online propensity

To be able to measure the effect of the different dimensions of innovativeness on the online and offline propensity of consumers for two product types the parameters need to be defined. Questions 21 till 28 (Appendix A) were asked to measure these parameters. Firstly, it will be decided whether a factor analysis is meaningful in this case. Secondly, an exploratory factor analysis will be performed to see if the parameters load from the questions and to see if the dimensions can be reduced to the ones shown in the extended conceptual framework or not. This will be followed by a reliability analysis. Finally, the decision will be made on how to define the parameter online propensity.

As Janssens et al. (2008) indicate an exploratory factor analysis is useful for revealing underlying similarities between variables. The PCA with varimax rotation will be the one used here again. Moreover, the same as in the previous paragraph holds. Firstly, three assumptions need to be satisfied before an exploratory factor analysis can be considered meaningful. The data can be classified as interval under the assumption of equal appearing intervals of the five-point Likert scale thus satisfying the first assumption. Secondly, the measurement level is identical for al variables as can be seen in the questionnaire in Appendix A. Thirdly, with eight variables the rule of thumb for the number of respondents required for being able to perform an exploratory factor analysis is satisfied, as ten times the number of variables is 80. With 195 respondents this assumption is satisfied.

Secondly, we look at Bartlett's test of sphericity and KMO's test of MSA. The results can be found in Table 8 below.

Kaiser-Meyer-Olkin measure of sampling adequacy		0,604
Bartlett's test of sphericity	Sign.	0,000

Table 8. KMO and Bartlett's Test Online Propensity

Bartlett's test of sphericity shows that the variables are not uncorrelated, because it has a significant level of 0,000 the null hypothesis should be rejected. The global MSA value shown in table 8 above as well as the individual MSA values, which can be found in Appendix C.2 should be over 0,5. This is the case, thus a factor analysis may be performed and no variable needs to be rejected.

As discussed in the previous paragraph a researcher uses two criterions to determine the number of factors underlying a set of variables (Janssens et al. 2008). The location of the elbow in the "Scree plot" and the "Kaiser criterion". The "Scree plot" and the corresponding Eigenvalues are shown in figure 7 below.
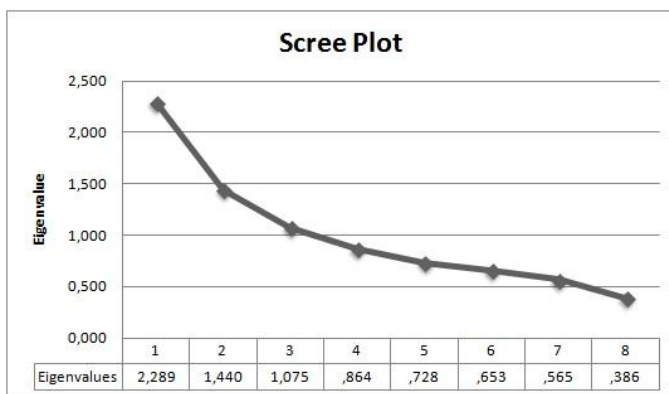
Figure 7. Scree Plot Online Propensity

When looking at the "Scree plot" in figure 7 above it is hard to distinguish a clear elbow. Based on the "Scree plot" it is not possible to determine the number of factors in the variables. However, the Eigenvalues suggest there are three underlying dimensions as there are three factors with Eigenvalues larger than one. Those three factors together explain 60% of the variance, see Appendix C.3.

Next, for each of the variables needs to be decided to which of the factors they belong and if it makes sense or that one or multiple variables should be kicked. In table 9 on the next page the rotated component matrix is displayed. For each of the variables the factors which the variables load on are highlighted.

Rotated Component Matrix[a]

	Component		
	1	2	3
Q.21. OnOff_Novel_1	,653	,352	-,106
Q.22. OnOff_Novel_2	-,191	-,015	,781
Q.23. OnOff_Novel_3	,233	,731	,035
Q.24. OnOff_Hardware_1	,744	,032	-,093
Q.25. OnOff_Hardware_2	-,054	-,027	,845
Q.26. OnOff_Hardware_3	,540	,481	-,023
Q.27. OnOff_1	-,647	,216	,161
Q.28. OnOff_2	-,198	,817	-,071

Extraction Method: Principal Component Analysis.

a. Rotation converged in 5 iterations.

Table 9. Rotation Component Matrix Online Propensity

When using what Janssens et al. (2008) call stricter rules in order to guarantee a purer definition of the factors items are only suitable when the loading on one factor is at least 0,75 and no more than 0,25 for all other factors. Only question 28 on factor 2, and questions 22 and 25 on factor 3 are pure enough when following these stricter rules. These stricter rules do not need to be applied per se, but they do give an indication of the overlap between factor 1 and factor 2. Hence, impulse buying might not be much of a differentiator between the variables and participating in online auctions as named in question 28 can also be considered as buying on impulse. Differentiating online and impulse online would not make a lot of sense, because question 26 loads on both factors and also question 21 loads too much on both factors when using the stricter rules, making the two dimensions consist of too few variables. As Janssens et al. (2008) argue, a factor needs at least three variables to be able to test a factor's reliability. Furthermore, the questions, OnOff_Novel 2 (question 22, Appendix A) and OnOff_Hardware 2 (question 25, Appendix A) ask about the preference of searching for information online and purchasing the product offline. Cheema and Papatla (2010) argue that the effect of online information would differ for Hedonic products and Utilitarian products. However, the rotated component matrix shows that both questions are linked and represent the same underlying factor. It would not make sense to label this factor as online information or offline purchase, or both. OnOff_1 does not load on this factor and this question (question 27, Appendix A) specifically asks people for their attitude towards offline shopping. The effect of information on online propensity of consumers is interesting but needs to be examined in future research. The questions are more linked to the similarity in the questions than to the two product types. Table 8 clearly shows the links between questions 21 and 24, 22 and 25, and 23 and 26.

Moreover, it is impossible to distinguish between online and offline propensity as question 27 and 28 load on different factors. I suspect that the parameters online propensity and offline propensity are exclusive, meaning that all respondents who shop more online, implicitly shop less offline and vice versa. There is a total value for shopping for each consumer and the value for online propensity determines whether this is more likely to be done online or offline. The negative loading of question 27 together with questions 21 and 24 further support this anticipation. Therefore, I have adjusted my conceptual framework and renamed the two separate parameters to one parameter named online propensity. Online propensity gives an indication of whether a respondent is more likely to shop more online or offline. The extended conceptual framework is shown in Figure 8 below.
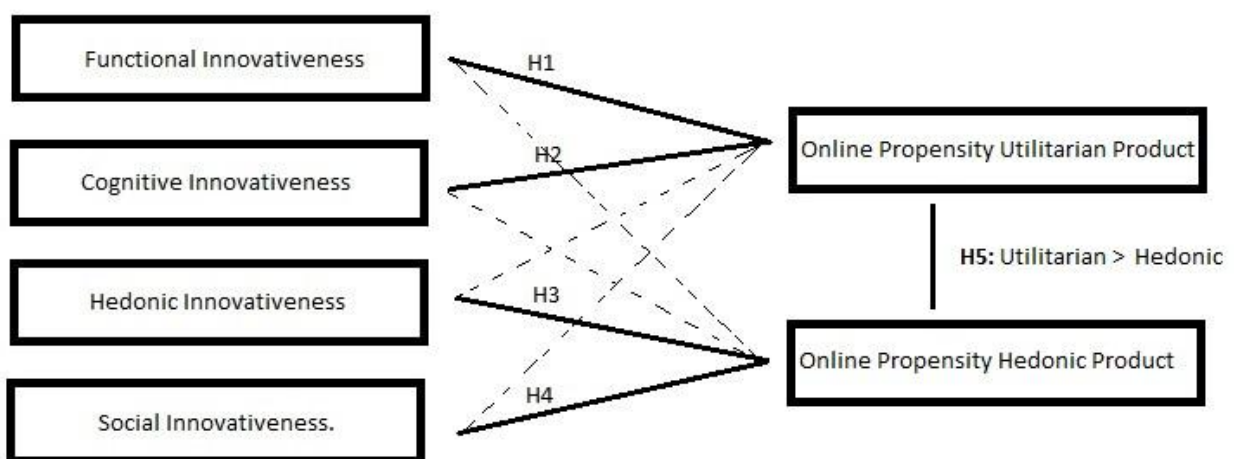
Figure. 8. Extended Conceptual Framework

The discussion of the rotated component matrix above as well as the absent elbow in the "scree plot" makes it illogical to use factor analysis as a way to reduce dimensions. A reliability analysis is needed to see if the parameter online propensity as shown in the adjusted conceptual framework may be formed from those eight variables and which variables need to be excluded. When looking at the practical significance of the parameter it does not make sense to construct the parameter from both the questions about the utilitarian product as well as the questions about the hedonic product. Therefore, the parameter online propensity will be constructed twice: Once for the product category utilitarian product and once for the product category hedonic product. The questions which are not asked for a specific product category are excluded from the analyses as they are too vague and no conclusion can be drawn to which of the two product categories they belong. The reliability analyses of the two parameters will be in the following two paragraphs.

4.4.3. Online propensity utilitarian product

Firstly, the parameter online propesity for a utilitarian product will be constructed. The reliability analyses for the parameter online propensity utilitarian product is shown in table 10 below.

Reliability Statistics	N of items	Cronbach's Alpha	N of items	Cronbach's Alpha
	3	0,068	2	0,544
Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q.24. OnOff_Hardware_1	,100	-,165	,381	
Q.25. OnOff_Hardware_2	-,179	,544		
Q.26. OnOff_Hardware_3	,256	-,522	,381	

Table 10. Reliability Analyses Online Propensity Utilitarian Product

As expected, question 25 does not correspond with the other two questions and the Cronbach's Alpha of 0,068 is unacceptable. Hence, the variable needs to be eliminated. When question 25 is eliminated the value of Cronbach's Alpha increases to 0,544, which is still not perfect and summation should be carefully considered (Janssens et al. 2008). The value of Cronbach's Alpha does not reach the desired value of 0,8 and the value of 0,544 is not considered a good score (Janssens et al. 2008). Field (2005) indicates that the corrected item-total correlation should be over 0,3. When this score is lower than 0,3 the interpretation of the parameter may cause problems. Moreover, it indicates a lack of consistency in the parameter. This criterion is passed by the parameter and because Cronbach's Alpha is only slightly too low, which may very well be caused by the low number of variables out of which the parameter is constructed, summation is used for the parameter online propensity utilitarian product.

4.4.4. Online propensity hedonic product

Secondly, the parameter online propensity for a hedonic product will be constructed. The reliability analyses for the parameter online propensity hedonic product is shown in table 11 on the next page.

Reliability Statistics	N of items	Cronbach's Alpha	N of items	Cronbach's Alpha
	3	0,069	2	0,542
Item	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q.21. OnOff_Novel_1	,074	-,135	,372	
Q.22. OnOff_Novel_2	-,185	,542		
Q.23. OnOff_Novel_3	,244	-,619	,372	

Table 11. Reliability Analyses Online Propensity Hedonic Product

As expected, question 25 does not correspond with the other two questions and the Cronbach's Alpha of 0,069 is unacceptable. Hence, the variable needs to be eliminated. When question 22 is eliminated the value of Cronbach's Alpha increases to 0,542, which is still not perfect and summation should be carefully considered (Janssens et al. 2008). The value of Cronbach's Alpha does not reach the desired value of 0,8 and the value of 0,542 is not considered a good score (Janssens et al. 2008). Field (2005) indicates that the corrected item-total correlation should be over 0,3 because when this score is lower interpretation may cause problems and it indicates a lack of consistency in the parameter. This criterion is passed by the parameter and because Cronbach's Alpha is only slight too low, which might very well be caused by the low number of variables out of which the parameter is constructed, summation is used for the parameter online propensity utilitarian product.

The correlation between the two parameters, online propensity utilitarian product and online propensity hedonic product, is 0,381. This indicates that there is some correlation but they cannot be considered as being the same. The differences between the two parameters will be further examined in chapter 5 when the hypothesis are tested.

5. Results

In this chapter the hypotheses will be tested and the results will be discussed. Firstly, the skewness and kurtosis test will be executed to determine which test to use for the first four hypotheses and secondly, the correlation test will be executed to test the first four hypotheses. Finally, the fifth hypothesis will be discussed and tested.

5.1. Skewness and kurtosis-test

As Field (2005) argues one of the assumptions of performing a parametric test is the normal distribution of the data. To test this Field (2005) recommends looking at histograms of the frequencies of variables for a visual indication and to calculate skewness and kurtosis scores. The closer to zero those scores are, the stronger the assumption of normality of the distribution of the data. Furthermore, the z-scores can be calculated to determine whether the skewness and kurtosis scores differ significant from zero. However, this is less useful for large datasets (>200), because this has a decreasing effect of the standard deviation and therefore the visual indicators are also important. The first two histograms shown in figure 9 below show the frequencies for the parameters online propensity utilitarian and online propensity hedonic. Visually, the data for online propensity hedonic seems slightly skewed to the left and also looks a bit more pointy than the normal curve, which would indicate a positive kurtosis value. The data for online propensity utilitarian also seems slightly skewed to the left, but not as much as the data for online propensity hedonic. A positive kurtosis value is expected for both variables.
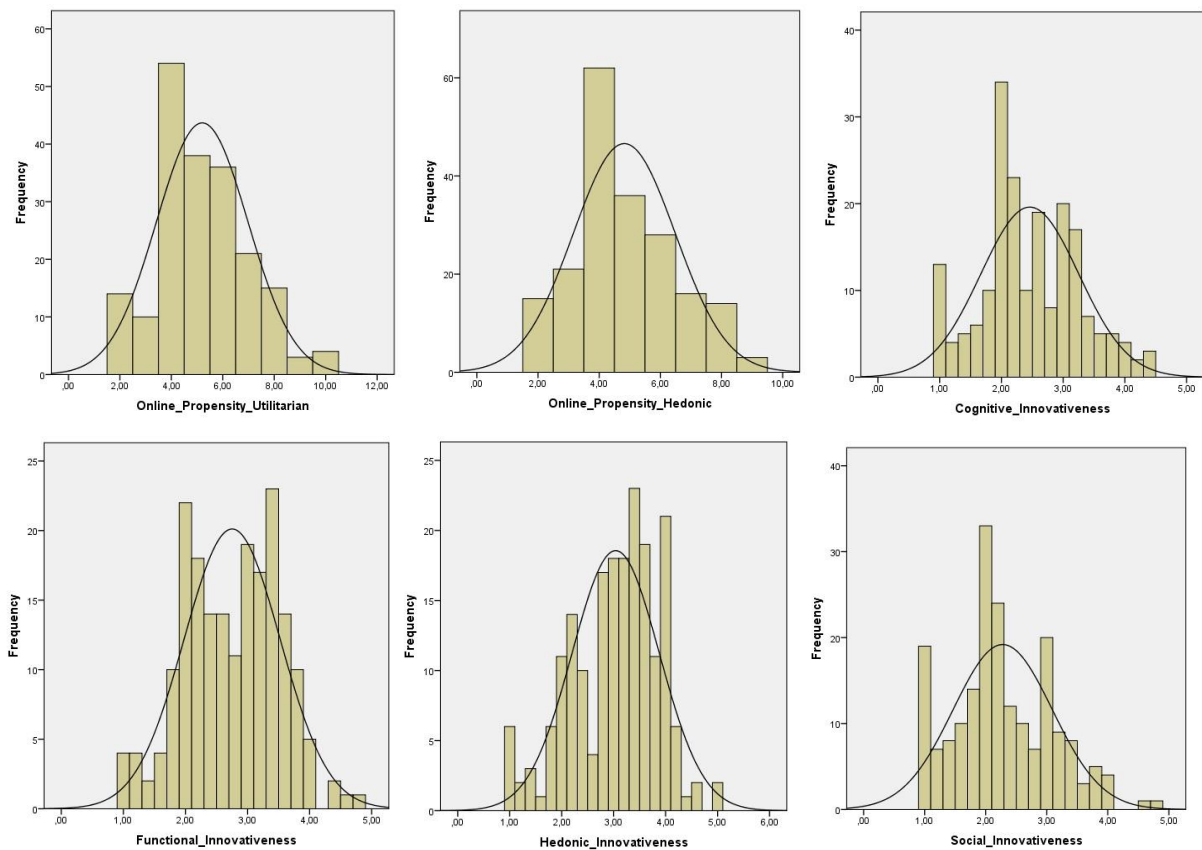

Figure 9. Histograms Online Propensity and Innovativeness

When looking at the four histograms for the different parameters of innovativeness, in figure 9 above, hedonic innovativeness seems to be somewhat skewed to the right and cognitive

innovativeness seems to be somewhat skewed to the left. Moreover, the whole values, 1, 2, 3, and 4 seem to be over represented, which leads to dents between those values. This might be because of the scale of the original variables and the wish of respondents to answer questions consistently. However, the visual indicators do not give a clear reason to conclude the data is not distributed normal. Hence, further analysis is needed.

As Field (2005) indicates another measure to see if the assumption of normal distribution is valid is calculating the skewness and kurtosis score with their respective z-scores. However, as said before, the z-scores are not the sole measure and should always be interpreted in combination with other information. Their values are calculated using the following formulas:

$$\mathbf{z}skewness = \frac{S-0}{\mathbf{SE}skewness} \; ; \; \mathbf{z}kurtosis = \frac{K-0}{\mathbf{SE}kurtosis}$$

Table 12 below gives an overview of the skewness and kurtosis scores with their calculated z-scores.

	Social Innovativeness	Functional Innovativeness	Hedonic Innovativeness	Cognitive Innovativeness	Online Propensity Utilitarian	Online Propensity Hedonic
Skewness	,406	-,084	-,460	,188	,386	,429
Std. Error of Skewness	,174	,174	,174	,174	,174	,174
Kurtosis	-,170	-,492	-,163	-,332	-,023	-,330
Std. Error of Kurtosis	,346	,346	,346	,346	,346	,346
z-Skewness	2,33	-0,48	-2,64	1,08	2,22	2,47
z-Kurtosis	-0,49	-1,42	-0,47	-0,96	-0,07	-0,95

Table 12. Skewness and Kurtosis

By looking at the standardized z-scores for skewness and kurtosis in table 12 above we can conclude that the kurtosis-scores are all within the threshold of 1.96 for significance at *p < 0,05*. However, the z-scores for skewness of social innovativeness and hedonic innovativeness are outside this threshold. The same can be said for the z-scores for skewness for online propensity utilitarian and online propensity hedonic. Field (2005) argues that a researcher could take comfort when the sample is large (>200) and all values are below the upper threshold of 3.29 for significance at *p < 0,001*. When looking at the visual indicators the histograms shows a higher frequency of 1 for social innovativeness. As argued before this could be because of the urge to be consistent in their answers. The skewness of hedonic innovativeness to the right is something to consider, but in itself not enough to use a non-parametric test instead of a parametric test. Therefore, the parametric Pearson's correlations test will be used to test the first four hypotheses.

5.2. Testing hypothesis 1 - 4

In this paragraph the first four hypotheses will be tested. As stated in paragraph 2.3 the first four hypotheses are as follows:

H1: Respondents who score higher on functional innovativeness score higher on online propensity.

H2: Respondents who score higher on cognitive innovativeness score higher on online propensity.

H3: Respondents who score higher on hedonic innovativeness score lower on online propensity.

H4: Respondents who score higher on social innovativeness score lower on online propensity.

Before looking at the correlation scores it is essential to look at the scatterplots to get insight in the general trend of the data. The scatterplots can be found in Appendix D. When looking at the scatterplots it is hard to distinguish general trends of the data. One of the things that stands out though is that men seem to have more online propensity than women, especially for utilitarian products, as well as higher scores for the different dimensions of innovativeness. Moreover, online propensity for utilitarian products tends to be higher than online propensity for hedonic products. When looking at the scatterplot of hedonic innovativeness and online propensity it seems to be that people that score high on online propensity also score high on hedonic innovativeness as the lower right corner is empty. This is especially the case for online propensity for utilitarian products.

To test these hypotheses the respective correlation scores between the two parameters has been calculated and in the next paragraph a regression analysis has been performed. The correlation scores and its corresponding significance can be found in table 13 below. The significance is 1-tailed because a direction is expected, as stated in the hypotheses.

	Functional Innovativeness	Cognitive Innovativeness	Hedonic Innovativeness	Social Innovativeness
Online Propensity Utilitarian	0,112	0,141	0,263	0,138
Sig. (1-tailed)	0,060	0,025	0,000	0,027
Online Propensity Hedonic	0,187	0,115	0,202	0,076
Sig. (1-tailed)	0,004	0,054	0,002	0,146

Table 13. Correlations

For the first hypothesis we look at the correlation scores of functional innovativeness with online propensity for utilitarian and hedonic products. The correlation score of 0,187 for

online propensity hedonic is significant at $p < 0,05$, but as Field (2005) indicates an effect of 0,187 is only a small effect. The correlation score of 0,112 for online propensity utilitarian is not significant at $p < 0,05$ so cannot be taken into account. Moreover, the scatterplots do not give a visual indication of a clear trend so it is impossible to accept the hypothesis. When looking at the causality it becomes even more difficult, because it is impossible to determine which influences which and a third variable might influence both. To conclude, the link between the two parameters is too weak and H1 is rejected for both product categories.

For the second hypothesis we look at the correlations scores of cognitive innovativeness with online propensity for utilitarian and hedonic products. The correlation score of 0,115 for online propensity hedonic is not significant at $p < 0,05$ and the correlation score for online propensity utilitarian of 0,141 is significant at $p < 0,05$, but is also only a small effect. Moreover, the scatterplots do not give a visual indication of a clear trend. Hence, H2 needs to be rejected for both product categories.

For the third hypothesis we look at the correlation scores of hedonic innovativeness with online propensity for utilitarian and hedonic products. When we look at the scatterplots for hedonic innovativeness a trend is somewhat visible. Respondents who score high on online propensity do not score low on hedonic innovativeness. Hence, a positive correlation is to be expected. This is especially the case when we look at the scatterplot of online propensity for utilitarian products with hedonic innovativeness. The correlation scores and their respective significance values can be found in table 13 on the previous page. The correlation score for hedonic innovativeness with online propensity utilitarian, 0,263, has been highlighted in the table and is significant at $p < 0,05$. This correlation score can be classified as a medium effect (Field 2005). The correlation score for hedonic innovativeness with online propensity hedonic, 0,202, is also significant at $p < 0,05$ and according to Field (2005) this is a small to medium effect. However, the hypothesis projected a negative correlation between the two parameters. Hypothesis 3 needs to be rejected.

This is a somewhat surprising outcome, because the values corresponding with hedonic innovativeness, pleasure and excitement, (Vandecasteele and Geuens 2010) are usually not associated with the online shopper. Convenience (Beauchamp and Ponder 2010) and security perception (Park and Kim 2003) are important drivers of online shopping. Moreover, Rohm and Swaminathan (2004) argue that recreation and enjoyment as shopping type is not supported in their online study.

Next up for testing is hypothesis 4. When we look at the scatterplots of social innovativeness and online propensity it is hard to see a clear trend. Also the correlation score with online propensity utilitarian of 0,138, significant at $p < 0,05$, is not very conclusive. It is not only a small effect, the effect is also opposite from what was expected. A negative correlation was expected, a weak positive correlation is found instead. Moreover, it is interesting to point out that if the test was 2-tailed the correlation found would not have been significant at $p < 0,05$, because then the p-value would have been 0,54 (2 times 0,0375). The correlation score of 0,076 with online propensity hedonic is not only very small, it is also not significant at $p < 0,05$. Hence, the data shows that there is no clear relationship between the parameters online propensity and social innovativeness. H4 needs to be rejected.

5.3. Regression analysis

In this paragraph a linear regression analysis will be performed to test if the correlations as found in the previous paragraph also have a predicting effect on online propensity for hedonic and utilitarian products. The moderating effect of gender and age will be tested in the next paragraph.

The general form of the linear regression model is as follows:

$$Y = b_0 + b_1X_1 + b_2X_2 + ... + b_nX_n + \varepsilon$$

Where Y = dependent variable

X_i = independent variable

B_i = coefficient

ε = disturbance term

In this research the dependent variable will be online propensity and the independent variables will be the four dimensions of innovativeness, gender and age. Furthermore the moderating effect of product categories will be examined.

Before discussing the regression analyses nine assumptions need to be made, or else the research will be less valid and less reliable, according to Janssens et al. (2008). They will be discussed below as they are similar for both dependent variables.

1) *Causality must be present*. In chapter 2.3 this it discussed elaborately and causality is assumed to be present.

2) *All of the relevant independent variables must be taken into consideration*. It can be argued more variables, like income and cultural background, also influence the dependent variable. However, that information is not available for this research and all

relevant information which is available is used.

3) *The dependent and independent variable must be at least interval scaled.* This is the case in this research as can be read in chapter 3.

4) *There must be linear relationship between the dependent and independent variables.* There is no reason to assume a non-linear relationship. Hence, a linear relationship is expected.

5) *An additive relationship is assumed.* The additive relationship has been hypothesized in chapter 2.3.

6) *The residuals must be independent and normally distributed.* The normality of the data has been discussed in chapter 5.1. And it is assumed that the respondents have independently filled in the questionnaire.

7) *There should be a sufficient number of observations.* Five times as many observations is the rule of thumb. With 7 variables and 195 respondents this is assumption is satisfied.

8) *No multicollinearity.* As tested in chapter 4, the correlation between the dependent variables do not exceed the threshold of 0,6. Hence this assumptions is satisfied.

9) *Attention for outliers.* The descriptive statistics in chapter 3.3 revealed no outliers, not in the last place because a five-point Likert-scale was used.

When looking at the discussion of the assumptions above a regression analysis seems justified. Assumption 2 seems to be the only assumption that may cause problems as the data available might not me elaborate enough. This will be discussed at the end of this chapter and will most likely result in suggestions for future research.

5.3.1. Regression Online Propensity Hedonic Product

The unstandardized coefficients and the corresponding significance values are shown in table 14 below. The complete results of the regression analysis can be found in Appendix E.1. The significant independent variables have been highlighted.

Model Hedonic	Unstandardized Coefficients B	Significance
Constant	3,301	0,000
Social Innovativeness	-0,094	0,597
Functional Innovativeness	0,270	0,137
Hedonic Innovativeness	0,350	0,061
Cognitive Innovativeness	-0,030	0,874

Table 14. Regression Analysis Hedonic Product

As there is no significant independent variable, besides the constant, at $p < 0,05,$ the regression model would look as follows:

$$Online\ Propensity\ Hedonic\ Product = 3,301 + \varepsilon$$

The model above is quite useless as all the variance is hidden in the disturbance term. Thus far, it seems that the issues with assumption 2 as discussed before have quite a big effect. Moreover, the r-square of 0,054 is very low. Only 5,4% of the variance is explained by the dependent variables. Hence, the causality as discussed in chapter 2.3 is not found. This is not really surprising as the correlations discussed in paragraph 5.1. already indicated only small or no effects. However, it is interesting to point out that the positive effect of hedonic innovativeness on online propensity for hedonic products is significant at $p < 0,10.$ Which means there is an indication there is some positive effect of hedonic innovativeness on online propensity for hedonic products. Further research is needed to validate this effect.

Table 15 below shows the unstandardized coefficients and the corresponding significance values now the regression model is extended with the independent variables gender and age. The significant independent variables have been highlighted. The complete results of the regression analysis can be found in Appendix E.2. Adding gender and age should partly help resolve the issues with assumption 2 as they are also expected to be relevant independent variables as discussed in chapter 2.3.

Model Hedonic	Unstandardized Coefficients B	Significance
Constant	4,181	0,000
Social Innovativeness	-0,100	0,574
Functional Innovativeness	0,304	0,099
Hedonic Innovativeness	0,297	0,134
Cognitive Innovativeness	-0,079	0,681
Gender	-0,399	0,113
Age	-0,002	0,828

Table 15. Extended Regression Analysis Hedonic Product

Even when adding the independent variables gender and age only the constant is significant, at $p < 0,05.$ Hence, the regression model is as follows:

$$Online\ Propensity\ Hedonic\ Product = 4,181 + \varepsilon$$

The regression model above is still quite useless for predicting a respondents online propensity. R-square, 0,063 is still very low. However, the conclusion is quite interesting: Gender and age do not have a significant effect on a consumers online propensity for hedonic

products.

Moreover, it is interesting to point out that the positive effect of functional innovativeness on online propensity for hedonic products is significant at *p < 0,10*. Which means there is an indication there is some positive effect of functional innovativeness on online propensity for hedonic products. Further research is needed to validate this effect..

5.3.2. Regression Online Propensity Utilitarian Product

In this paragraph the regression analysis will be performed with online propensity for utilitarian products as the dependent variable. The unstandardized coefficients and the corresponding significance values are shown in table 16 below. The complete results of the regression analysis can be found in Appendix E.3. The significant independent variables have been highlighted.

Model Utilitarian	Unstandardized Coefficients B	Significance
Constant	3,538	0,000
Social Innovativeness	-0,007	0,972
Functional Innovativeness	-0,038	0,844
Hedonic Innovativeness	0,565	0,005
Cognitive Innovativeness	0,026	0,895

Table 16. Regression Analysis Utilitarian Product

With hedonic innovativeness being the only significant independent variable, besides the constant, the regression model would look like as follows:

$Online\ Propensity\ Utilitarian\ Product = 3,538 + 0,565\ Hedonic\ Innovativeness + \varepsilon$

The positive effect of hedonic innovativeness on the online propensity for utilitarian products was expected because of the medium correlation which was found in paragraph 5.1. There are still some issues with assumption 2, because it is unlikely that hedonic innovativeness is the only predictor for online propensity for utilitarian products. This is also reflected in the r-square of 0,069 which means only 6,9% of the variance is explained. The relation itself is surprising though as hedonic innovativeness was expected to have a bigger influence on online propensity for hedonic products than online propensity for utilitarian products. This model the effects of gender and age also need to be added, because a negative effect is expected.

Table 17 on the next page shows the unstandardized coefficients and the corresponding significance values now the regression model is extended with the independent variables gender and age. The significant independent variables have been highlighted. The complete

results of the regression analysis can be found in Appendix E.4. Adding gender and age should partly help resolve the issues with assumption 2 as they are also expected to be relevant independent variables as discussed in chapter 2.3.

Model Utilitarian	Unstandardized Coefficients B	Significance
Constant	6,575	0,000
Social Innovativeness	-0,044	0,803
Functional Innovativeness	0,052	0,778
Hedonic Innovativeness	0,330	0,098
Cognitive Innovativeness	-0,020	0,919
Gender	-0,854	0,001
Age	-0,032	0,002

Table 17. Extended Regression Analysis Utilitarian Product

As can be seen in table 17 above, hedonic innovativeness is no longer significant, at $p < 0,05$ in predicting a consumers online propensity for a utilitarian product. However, gender and age do have a significant negative effect on online propensity for a utilitarian product. The regression model is as follows:

$$Online\ Propensity\ Utilitarian\ Product = 6,575 - 0,854\ Gender - 0,032\ Age + \varepsilon$$

Where gender is 0 for male and 1 for female and age is in years. The r-square is now 0,152, which means 15,2% of the variance is explained. However, it is interesting to point out that the positive effect of hedonic innovativeness on online propensity for utilitarian products is significant at $p < 0,10$. Which means there is an indication there is some positive effect of hedonic innovativeness on online propensity for utilitarian products. Further research is needed to validate this effect.

5.4. Testing hypothesis 5-9

In this paragraph the remaining five hypotheses will be tested. As stated in paragraph 2.3 hypothesis 5 to 9 are as follows:

H5: Respondents have a higher online propensity for utilitarian products than for hedonic products.

H6: A consumers' online propensity for a utilitarian product has a moderating effect on the influence a consumers' functional innovativeness has on online propensity.

H7: A consumers' online propensity for a utilitarian product has a moderating effect on the

influence a consumers' cognitive innovativeness has on online propensity.

H8: A consumers' online propensity for a hedonic product has a moderating effect on the influence a consumers' hedonic innovativeness has on online propensity.

H9: A consumers' online propensity for a hedonic product has a moderating effect on the influence a consumers' social innovativeness has on online propensity.

To be able to test the rest of the hypotheses, the parameter online propensity needs to be defined. Thus far, the parameter was only defined separately for the two chosen product categories, hedonic and utilitarian. Recall the further extended conceptual framework with interactions in figure 10 below from chapter 2.3.
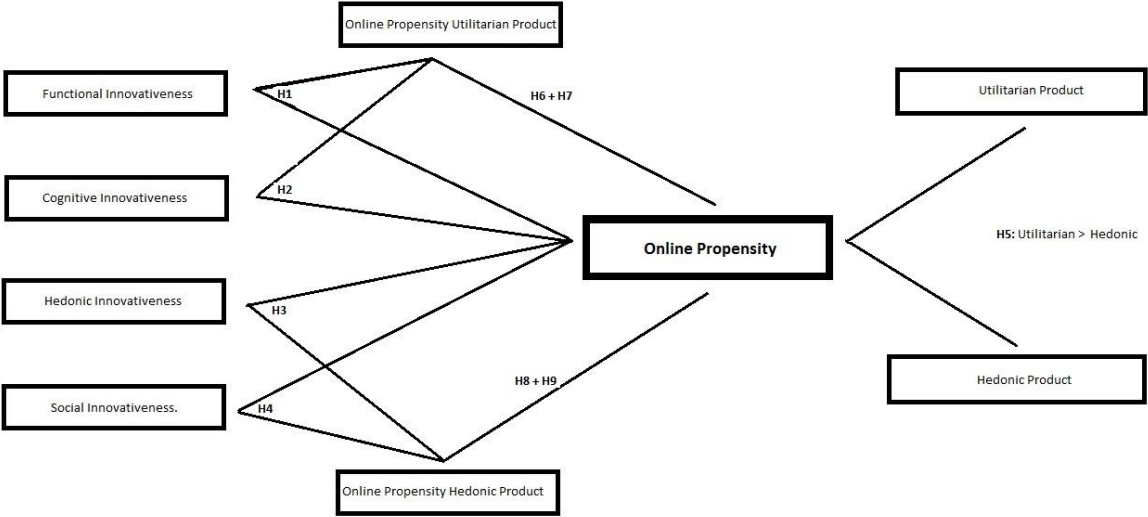
Figure 10. Further Extended Conceptual Framework with Interactions

The parameters of online propensity for utilitarian product and online propensity for hedonic product have been stacked to create the parameter online propensity. The four dimensions of innovativeness and the other variables have been kept the same. Due to the stacking, the size of the dataset has been doubled (n = 390). Moreover, a dummy variable has been created, where 0 corresponds to a consumers' online propensity for hedonic products and 1 corresponds to a consumers' online propensity for utilitarian products. This will allow interaction effects to be measured. The general regression model would be as follows:

$Online\ Propensity$

$$= \beta 0 \ + \ \beta 1(Online\ Propensity\ Utilitarian)$$
$$+ \ \beta 2(Social\ Innovativeness) \ + \ \beta 3(Functional\ Innovativeness$$
$$+ \ \beta 4(Hedonic\ Innovativeness) + \ \beta 5(Cognitive\ Innovativeness)$$
$$+ \ \beta 6(Gender) + \ \beta 7(Age)$$
$$+ \ \beta 8(Online\ Propensity\ Utilitarian\ x\ Social\ Innovativeness)$$
$$+ \ \beta 9(Online\ Propensity\ Utilitarian\ x\ Functional\ Innovativeness)$$
$$+ \ \beta 10(Online\ Propensity\ Utilitarian\ x\ Hedonic\ Innvoativeness)$$
$$+ \ \beta 11(Online\ Propensity\ Utilitarian\ x\ Cognitive\ Innovativeness) + \varepsilon$$

The unstandardized coefficients and the corresponding significance values are shown in table 18 below. The complete results of the regression analysis can be found in Appendix E.5. The significant independent variables have been highlighted.

Model Online Propensity	Unstandardized Coefficients B	Significance
Constant	5,252	0,000
Online Propensity Utilitarian	0,252	0,737
Social Innovativeness	-0,109	0,541
Functional Innovativeness	0,340	0,064
Hedonic Innovativeness	0,194	0,316
Cognitive Innovativeness	-0,079	0,680
Gender	-0,626	0,001
Age	-0,017	0,018
Online Propensity Utilitarian x Social Innovativeness	-0,074	0,770
Online Propensity Utilitarian x Functional Innovativeness	-0,325	0,207
Online Propensity Utilitarian x Hedonic Innovativeness	0,240	0,367
Online Propensity Utilitarian x Cognitive Innovativeness	0,059	0,825

Table 18. Regression Online Propensity

As can be seen in table 18 above, none of the main effects of the dimensions of innovativeness have a significant effect on online propensity at $p < 0,05$. The interaction effects and the dummy for online propensity for a utilitarian product are also not significant at $p < 0,05$. Gender and age do have a significant negative effect on online propensity. Hence, the regression model is as follows:

$$Online\ Propensity = 5.252 - 0,626\ Gender - \ 0,017\ Age + \ \varepsilon$$

Where gender is 0 for male and 1 for female and age is in years. The r-square is 0,110, which means 11% of the variance is explained by the model. Because neither the main effects of innovativeness and the effect of the product category utilitarian products, nor the interaction effects are significant all the hypotheses need to be rejected according to this model. However, it is interesting to point out that the positive effect of functional innovativeness on online propensity is significant at $p < 0,10$. Which means there is an indication there is some positive effect of functional innovativeness on online propensity. Further research is needed to validate this effect.

5.5. Short overview results

Before continuing to the managerial implications of the results a short overview of the results will be given. Table 19 below gives an overview of the tested subjects and a summary of the results.

Tested	Variable	Type	Tested with OPH	Tested with OPU	Tested with Online Propensity
Hypothesis 1	Functional	main effect	Rejected	rejected	rejected
Hypothesis 2	Cognitive	main effect	Rejected	rejected	rejected
Hypothesis 3	Hedonic	main effect	Rejected	opposite effect	rejected
Hypothesis 4	Social	main effect	Rejected	rejected	rejected
Hypothesis 5	Utilitarian > Hedonic	dummy	-	-	rejected
Hypothesis 6	Functional	interaction	-	-	rejected
Hypothesis 7	Cognitive	interaction	-	-	rejected
Hypothesis 8	Hedonic	interaction	-	-	rejected
Hypothesis 9	Social	interaction	-	-	rejected
Control test	Gender	main effect	no effect	negative effect	negative effect
Control test	Age	main effect	no effect	negative effect	negative effect

Table 19. Summary Table Results

None of the hypotheses are accepted, but the control tests show results similar to the literature. Further research is needed to uncover the relationship between the dimensions of innovativeness and online propensity. The most important finding is the positive correlation between hedonic innovativeness and online propensity for utilitarian products. Rohm and Swaminathan (2004) argue that recreation and enjoyment as shopping type is not supported in their online study, but times may have changed as hedonic innovativeness is associated with feelings of excitement and joy and is positively correlated with online propensity for utilitarian products.
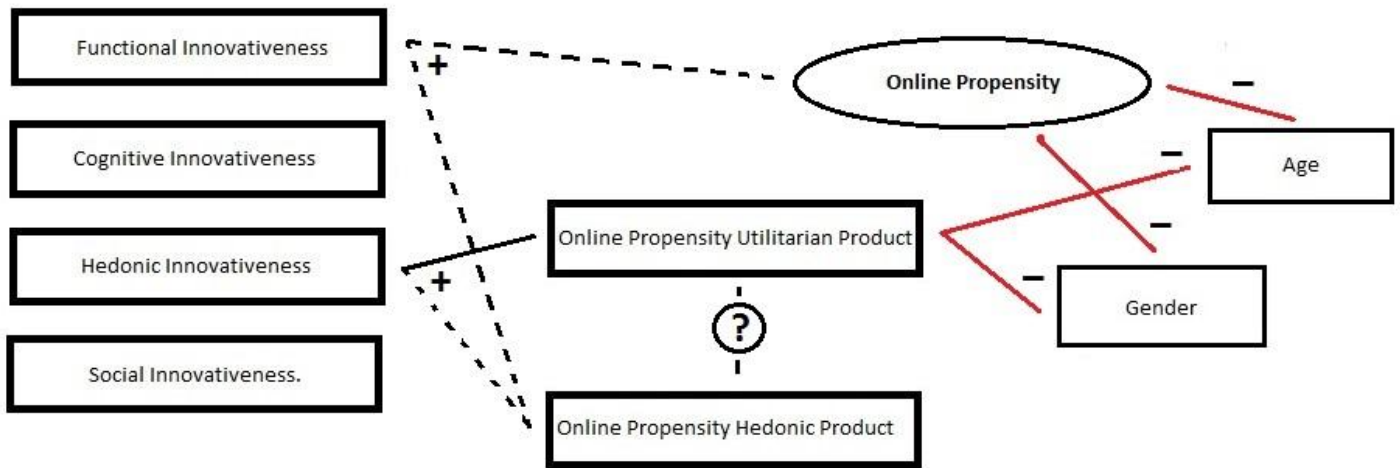
Figure 11. Results Incorporated in Conceptual Framework

Figure 11 above graphically shows the results in the conceptual framework. Red lines indicate negative relations, black lines indicate positive relations and dotted lines indicate positive relations at $p < 0,10$. The negative effect of gender indicates that women have a lower online propensity than men.

6. Managerial implications

In this chapter the managerial implications of the findings of this research will be discussed. The four dimensions of innovativeness are interesting for managers, because they reveal the values and motivations behind innovative behavior of the consumer. Vandercasteele and Geuens (2010) first developed their measurement scale to score respondents on their levels on the four dimensions of innovativeness in a Belgian sample. This research shows that their measurement scale can also be applied on Dutch consumers, which could be interesting for managers who would like to spot the innovators among their consumers and their reasoning behind their innovativeness. Marketing campaigns can be adjusted to the information they gather from their customers by asking them to fill out the measurement scale. Successful marketing campaigns can lead to quicker adoption of their new product and increase their profitability.

Probably the most interesting finding for managers is the link between hedonic innovativeness and online propensity for utilitarian products and the weak link between hedonic innovativeness and online propensity for hedonic products. Thus far literature has shown that recreation and enjoyment are not drivers of online purchase behavior (Rohm and Swaminathan 2004). Convenience and security perception where the most acknowledged drivers of online purchase behavior (Park and Kim 2003, Beauchamp and Ponder 2010).

45

However, Vandecasteele and Geuens (2010) define hedonic innovativeness as the self-reported consumer innovativeness motivated by affective or sensory stimulation and gratification. Online shopping behavior is evolving and there seem to be parallels with Maslow's hierarchy of needs theory (Maslow, 1954). At first the basic needs of the online shopper need to be satisfied, before the latter needs are important. Basic functioning of the website leading to convenience and security perception are lower levels of the pyramid and enjoyment and recreation are in a higher level. The shift of importance to the higher levels suggests that online shops have a higher basic level and website performance and security perception have become a point of parity. Meaning, an online shop needs to meet those points of parity to participate in the marketplace and they can differentiate themselves with higher levels of the pyramid. Research in the field of computer sciences support this parallel between Maslow's hierarchy of needs theory (Maslow, 1954) and online shopping behavior. Valacich et al. (2007) argue the existence of a hierarchy of needs pyramids for online consumers. This pyramid and the table with characteristics of the layers is shown in figure 12 below.

	Functional Convenience	Representational Delight	Structural Firmness
	Ease of navigation	Interface consistency	Response time
	Ease of use	Screen size and layout	Quick error recovery
	Provision of product/ service information	Provision of a visually appealing design	Correct operation (such as, no bad links)
	Feedback options	Innovative and creative design	Quality of firewalls
	One-click ordering (for example, amazon.com)	Pleasant background color	Provision of privacy policies
	Order tracking information	Use of graphics	Explicit security policies
	Provision of help feature	Provision of video/ audio links	Availability of security seals
	Variety of payment methods		

Figure 12. Online Consumers Hierarchy of Needs Pyramid and Characteristics (Valacich et al., 2007)

Hedonic innovativeness is positively linked to online propensity for utilitarian products and weakly linked to online propensity for hedonic products in this research. This would seem to imply that companies can increase the likelihood of adoption of a new product by living up to the standards in the market for structural firmness and functional convenience and excelling in the area of representational delight. However, Valacich et al. (2007) differentiate the importance of the upper part of the pyramid by three types of websites, utilitarian websites (for example, a bank), hybrid websites (for example, shopping and auctioning sites) and hedonic websites (for example, music of film websites). Hence, managers cannot base their decision making solely on the bottom part of the pyramid, but always need to keep in mind the business they are participating in.

Moreover, functional innovativeness is weakly linked to online propensity. Although further research is necessary, this gives some support to the existing literature about the role of convenience in online shopping (Beauchamp and Ponder, 2010 and Jiang et al., 2013). Recall, examples of reasons for buying the innovation when it is driven by functional innovativeness are: usefulness, handiness, compatibility, efficiency, comfort, easy to use, quality and reliability of the product (Vandecasteele and Geuens, 2010). This also corresponds with the online consumers hierarchy of needs pyramid by Valacich et al. (2007) in figure 12 on the previous page.

Furthermore, the role of age is interesting for managers. There is consensus in literature that as people get older they become more conservative. This implies that people also have a lower online propensity as they get older as online shopping is still relatively new. This research shows that age is not important for a consumers' online propensity for hedonic products. Overall, age has a negative effect on a consumers' online propensity but the product category does matter. Hence, managers needs to take the category their product participates in into account when deciding whether to target older consumers or not.

This research has not shown a distinct difference in online propensity between the product types utilitarian and hedonic. To be able to give managerial implications as to which product type is more suitable in an online shopping environment further research is needed. All that can be advised at this point is to take caution in choosing whether online or offline is the best way to sell your product.

7. Conclusions and limitations

In this final chapter the conclusions will be discussed in paragraph 7.1 and the limitations of this research will be discussed in paragraph 7.2. Moreover, suggestions for future research will also be discussed in paragraph 7.2.

7.1.   Conclusions

The first conclusion that can be drawn is about the measurement score for innovativeness as constructed by Vandecasteele and Geuens (2010). The measurement scale for innovativeness and its four dimensions, functional, cognitive, hedonic and social also holds in a Dutch sample. Moreover, the same effects of gender and age on this measurement scale has been found. Male respondents tend to be more innovative than female respondents and age does not always have a negative effect on innovativeness. Functional innovativeness and cognitive innovativeness are unaffected by age, whereas hedonic innovativeness and social

innovativeness are negatively affected by innovativeness.

Secondly, it was impossible to use an exploratory factor analysis to construct the parameters online propensity for hedonic and utilitarian products as the question linked more to each other than to the product category. A reliability analysis has been performed to construct both parameters and the online propensity has been created by stacking those two parameters.

Thirdly, when looking at the effect of the dimensions of innovativeness on online propensity for utilitarian products and hedonic products none of the four formed hypotheses can be accepted. The third hypothesis gets rejected because the opposite effect is found. Where a negative effect of hedonic innovativeness was expected a medium positive effect is found. Rohm and Swaminathan (2004) did not find enjoyment and recreation as shopping types in their research. However, ten years later these shopping types might arise due to wider acceptance of online shopping. This gives reason to assume that there has been a shift in the mind of the online consumer. Convenience and security perception have become points of parity instead of points of difference for online shops and it can be argued we have achieved a higher level in the online consumers hierarchy of need (Valicich, 2007).

Fourthly, in the regression model for online propensity only the effect of age and gender are significant. None of the main effects and interaction effects are significant. Hence, all nine hypothesis are rejected. It seems like the four dimensions of innovativeness are not very good predictors of online propensity of consumers. The constructing of the parameter online parameter needs future refinement in future research, so it becomes more valid and reliable.

Fifthly, when looking at the difference between the product types utilitarian and hedonic no clear conclusions can be drawn. The data shows no clear indication of a difference in the online propensity of consumers between the product categories utilitarian and hedonic.

Finally, male respondents tend to score higher on online propensity than female respondents and younger respondents tend to score higher on online propensity than older respondents. However, this is not the case for online propensity for hedonic products.

7.2.   Limitations and future research

When a researcher looks back to his or her research there will be always parts that could have been done different or that can be improved or investigated further in future research. In this paragraph I will discuss these limitations and possibilities for future research.

The research of Vandecasteele and Geuens (2010) was a Belgian sample and as they argue nationality may influence innovation scores. My research was a Dutch sample and this may

have influenced my innovation scores. Now my research has shown that their dimensions of innovativeness also holds in a Dutch sample and it might be interesting for future research to apply their measurement scale on different product categories instead of just applying the general measurement scale. Applying the measurement scale to both the hedonic and utilitarian product might have given more insight. Furthermore, it would be interesting to apply their measurement to a non-Western European sample to see whether it can be applied broader.

An obvious limitation to this research is the fact an online questionnaire was used to measure online propensity. It makes sense to assume that the sample is more biased towards online propensity than offline propensity, because of the way the sample was collected. A field study might give another outcome. On the other hand, internet plays such a big apart in the lives of a large majority of the population that it might not make a big difference.

Another limitation to this research is the lack of validity of the parameters online propensity for hedonic and utilitarian products and thus of the parameter online propensity. It is only constructed out of two variables and it would be very interesting for future research to define online propensity further and create a more valid general measurement scale, like the one already existing for measuring innovativeness. Moreover, this would give room for more drivers of online propensity to be included as information sources, security perception and shopping convenience for example. Once this general measurement scale is created it would be interesting to test the differences between different product types.

Furthermore, a limitation is that innovativeness does not seem to be very useful in predicting online propensity. As said above, it might be because of the lack of validity of the parameter online propensity, but it needs to be considered that the four dimensions of innovativeness are just not good predictors for online propensity of consumers.

Although there is no data about education level of the respondents it can be assumed that most of the respondents are highly educated, because of the way the questionnaire was distributed. Many of the respondents are students and the overlap of one of the items to measure cognitive innovativeness with the items for hedonic innovativeness. Satisfying the analytical mind is perceived as being fun by the respondents, which further supports the assumption. However, a mostly highly educated sample is a limitation as they only represent about five to ten percent of the general population and this might bias the outcomes. It would be interesting for future research to use a more representative sample. Moreover, there is no information about income levels which may very well influence innovativeness and online propensity levels.

Finally, this research only uses self-stated levels of innovativeness and online propensity on a five-point Likert-scale and this might not reflect actual behavior. There is always a bias in what people state about their behavior and their actual behavior.

Moreover, a five-point Likert scale is not very precise as people tend to avoid the extreme answer options. A seven-point or a nine-point Likert scale might provide more information due to an increase of variance in the data. On the other hand, a larger Likert-scale might confuse respondents and respondents might perceive the difference in the steps differently and the extreme answer options might be avoided even more.

8. Bibliography

Agarwal, R. and Prasad, J. (1998). *A Conceptual and Operational Definition of Personal Innovativeness in the Domain of Information Technology,* Tallahassee, The Florida State University.

Alba, J., Lynch, J., Weitz, B., Janiszewski, C., Lutz, R., Sawyer, A. and Wood, S. (1997). *Interactive Home Shopping: Consumer, Retailer, and Manufacturer Incentives to Participate in Electronic Marketplaces.* Journal of Marketing, Vol. 61, No. 3, page 38-53.

Beauchamp, M. B. and Ponder, N. (2010). *Perceptions of retail convenience for in-store and online shoppers.* The Marketing Management Journal, Vol. 20. No. 1, page 59-65.

Cheema, A and Papatla, P. (2010) *Relative importance of online versus offline information for Internet purchases: Product category and Internet experience effects.* Journal of Business Research, Vol. 63, page 979-985.

Danahar, P. J., Wilson, I. W. And Davis, R. A. (2003). *A Comparison of Online and Offline Consumer Brand Loyalty,* Journal of Marketing Science, Vol. 22, No. 4, page 461-476.

Darley, W. K., Blankson, C. and Luethge, D. J. (2010). *Toward an Integrated Framework for Online Consumer Behavior and Decision Making Process: A Review.* Journal of Psychology and Marketing, Vol. 27, No. 2, page 94-116.

Degeratu, A. M., Rangaswamy, A. and Wu, J. (2000). *Consumer choice behaviour in online and traditional supermarkets: The effects of brand name, price, and other search attributes.* International Journal of Research in Marketing, Vol. 17, page 55-78.

Field, A. (2005). *Discovering Statistics Using SPSS.* London England, SAGE Publications Ltd, 2nd edition.

Flynn, L. R. and Goldsmith, R. E. (1999). *A Short, Reliable Measure of Subjective Knowledge*, Journal of Business Research, No. 46, page 57-66.

Goldsmith, R. E. and Hofacker, C. F. (1991). *Measuring Consumer Innovativeness,* Journal of the Academy of Marketing Science, Vol. 19, No. 3, page 209-221.

Hirschman, E. C. (1980). *Innovativeness, Novelty Seeking, and Consumer Creativity,* Journal of Consumer Research, Vol. 7, No. 3, page 283-295.

Janssens, W., Wijnen, K., Pelsmacker, de, P. and Kenhoven, van, P. (2008). *Marketing Research with SPSS,* Essex England, Pearson Education Limited

Jiang, L., Yang, Z. and Jun, M. (2013). *Measuring consumer perceptions of online shopping convenience.* Journal of Service Management, Vol. 24, No. 2, page, 191-214.

Kau, A. K., Tang, Y. E. and Ghose, S. (2003). *Typology of online shoppers.* Journal of Consumer Marketing, Vol. 20, No. 2, page 139-156.

Maslow, A. H. (1954). *Motivation and Personality.* New York, Harper and Row, first printing.

Midgley, D. F. and Dowling, G. R. (1978). *Innovativeness: The Concept and Its Measurement,* Journal of Consumer Research, Vol. 4, No. 4, page 229-242.

Moore, D. S., McCabe, G. P., Duckworth, W. M. and Sclove, S. L. (2003). *The Practice of Business Statistics,* New York, W. H. Freeman and Company, third printing.

Park, C.-H. and Kim, Y.-G. (2003). *Identifying key factors affecting consumer purchase behavior in an online shopping context.* International Journal of Retail and Distribution Management. Vol. 31, No. 1, page 16-29.

Rogers, E. M. and Shoemaker, F. F. (1983). *Diffusion of Innovations, third edition,* The Free Press, New York.

Rohm, A. J. and Swaminathan, V. (2004). *A typology of online shoppers based on shopping motivations.* Journal of Business Research, Vol. 57. Page 748-757.

Steenkamp, J-B. E. M. and Gielens, K. (2003). *Consumer and Market Drivers of the Trial Probability of New Consumer Packaged Goods,* Journal of Consumer Research, Vol. 30, No. 3, page 368-384.

Vandecasteele, B. and Geuens, M. (2010). *Motivated Consumer Innovativeness: Concept, measurement, and validation,* International Journal of Research in Marketing 27, page 308-318.

Valicich, J. S., Parboteeah, D. V. and Wells, J. D. (2007). *The Online Consumer's Hierarchy of Need,* Communications of the ACM, Vol. 50, No 9, page 84-90.

8.1. Websites

www.cbs.nl

- http://www.cbs.nl/nl-NL/menu/themas/bedrijven/publicaties/digitale-economie/artikelen/2011-3416-wm.htm, accessed on march 25, 2014

www.marketingfacts.nl

- http://www.marketingfacts.nl/berichten/omzet-nederlandse-webwinkels-groeit-met-9-ondanks-crisis, accessed on march 25, 2014

Appendix

A. Survey questions

Introduction of survey:

Thank you for taking your time in filling in this survey for my master thesis. In this survey you'll be asked to answer questions about your way of adopting new products (innovations). Your answers will be recorded anonymous and dealt with confidentially. It will take you approximately 5-10 minutes.

Kind regards,

Evert Dam

They are measured using a five-point Likert-scale. 1 = strongly disagree, to 5 = strongly agree.

Variable Social Innovativeness:
1. I love to use innovations that impress others.
2. I like to own a new product that distinguishes me from others who do not own this new product.
3. I prefer to try new products with which I can present myself to my friends and neighbours.
4. I like to outdo others, and I prefer to do this by buying new products which my friends do not have.
5. I deliberately buy novelties that are visible to others and which command respect from others.

Variable Functional Innovativeness:
6. If a new time-saving product is launched, I will buy it right away.
7. If a new product gives me more comfort than my current product I would not hesitate to buy it.
8. If an innovation is more functional, then I usually buy it.
9. If I discover a new product in a more convenient size, I am very inclined to buy this.
10. If a new product makes my work easier, then this new product is a "must" for me.

Variable Hedonic Innovativeness
11. Using novelties gives me a sense of personal enjoyment.
12. It gives me a good feeling to acquire new products.
13. Innovations make my life exciting and stimulating.
14. Acquiring innovations make me happier.
15. The discovery of novelties makes me playful and cheerful.

Variable Cognitive Innovativeness
16. I mostly buy those innovations that satisfy my analytical mind.
17. I find innovations that need a lot of thinking intellectually challenging and therefore I buy them instantly.

18. I often buy new products that make me think logically.
19. I often buy innovative products that challenge the strengths and weaknesses of my intellectual skills.
20. I am an intellectual thinker who buys new products because they set my brain to work.

They are also measured on a five-point Likert-scale. 1 = strongly disagree, to 5 = strongly agree.

Variable Online/Offline Propensity of Consumers
21. I prefer to buy **a novel** from an online store, compared to a physical store.
22. I prefer gathering information about **a novel** online and purchase the product in a physical store.
23. I am more likely to buy **a novel** on impulse online, compared to a physical store.

24. I prefer to buy **computer hardware** from an online store, compared to a physical store.
25. I prefer gathering information about **computer hardware** online and purchase the product in a physical store.
26. I am more likely to buy **computer hardware** on impulse online, compared to a physical store.

27. I like strolling downtown and shop multiple stores.
28. I like participating in online auctions.

Other Variables
29. Gender
30. Age

B. Factor analysis innovativeness

B.1. Global MSA and Bartlett's test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,901
Bartlett's Test of Sphericity	Approx. Chi-Square	2301,464
	Df	190
	Sig.	,000

B.2. Individual MSA

Anti-image Correlation

Social_In_1	,891a	-,426	-,303	-,124	-,009	-,010	,055	-,034	,115	-,007	-,211	,065	-,074	-,025	,117	-,005	-,040	-,098	,001	,025
Social_In_2	-,426	,888a	-,135	-,195	-,078	-,088	,069	,003	-,031	-,089	-,126	,082	-,119	,127	-,082	-,116	,089	-,060	,153	-,057
Social_In_3	-,303	-,135	,903a	-,135	-,258	,116	-,085	,047	-,063	,054	,087	-,158	,067	-,065	-,142	,109	-,056	,123	-,173	-,017
Social_In_4	-,124	-,195	-,135	,915a	-,362	,023	,028	-,028	-,043	,027	,064	-,064	,073	-,090	,008	,019	-,033	,016	-,028	,014
Social_In_5	-,009	-,078	-,258	-,362	,883a	,068	-,053	,103	-,071	-,030	-,053	,040	-,056	-6,398E-05	,149	,002	-,057	,081	-,022	-,090
Functional_In_1	-,010	-,088	,116	,023	,068	,889a	-,281	,069	-,101	-,161	-,045	-,058	-,053	-,048	,015	,042	,006	,136	-,083	-,115
Functional_In_2	,055	,069	-,085	,028	-,053	-,281	,859a	-,459	-,100	-,105	-,110	-,002	-,020	,096	,060	,043	-,077	-,006	-,027	-,001
Functional_In_3	-,034	,003	,047	-,028	,103	,069	-,459	,851a	-,266	-,237	-,027	,085	-,035	-,172	,148	-,014	,035	-,045	,023	-,100
Functional_In_4	,115	-,031	-,063	-,043	-,071	-,101	-,100	-,266	,935a	-,189	,002	-,097	,015	-,019	-,109	,024	-,128	,008	,052	-,035
Functional_In_5	-,007	-,089	,054	,027	-,030	-,161	-,105	-,237	-,189	,922a	,007	,010	,065	-,065	-,097	-,019	-,118	-,028	-,012	,137
Hedonic_In_1	-,211	-,126	,087	,064	-,053	-,045	-,110	-,027	,002	,007	,915a	-,371	-,022	-,054	-,205	,020	,073	,068	-,087	,003
Hedonic_In_2	,065	,082	-,158	-,064	,040	-,058	-,002	,085	-,097	,010	-,371	,865a	-,136	-,099	-,041	-,141	,109	-,223	,239	-,044
Hedonic_In_3	-,074	-,119	,067	,073	-,056	-,053	-,020	-,035	,015	,065	-,022	-,136	,915a	-,420	-,249	,007	-,110	,065	-,009	,003
Hedonic_In_4	-,025	,127	-,065	-,090	-6,398E-05	-,048	,096	-,172	-,019	-,065	-,054	-,099	-,420	,910a	-,247	-,107	,086	-,041	-,080	,088
Hedonic_In_5	,117	-,082	-,142	,008	,149	,015	,060	,148	-,109	-,097	-,205	-,041	-,249	-,247	,912a	-,103	-,031	-,096	,100	-,121
Cognitive_In_1	-,005	-,116	,109	,019	,002	,042	,043	-,014	,024	-,019	,020	-,141	,007	-,107	-,103	,951a	-,218	-,056	-,141	-,057
Cognitive_In_2	-,040	,089	-,056	-,033	-,057	,006	-,077	,035	-,128	-,118	,073	,109	-,110	,086	-,031	-,218	,940a	-,095	-,170	-,115
Cognitive_In_3	-,098	-,060	,123	,016	,081	,136	-,006	-,045	,008	-,028	,068	-,223	,065	-,041	-,096	-,056	-,095	,888a	-,531	-,128
Cognitive_In_4	,001	,153	-,173	-,028	-,022	-,083	-,027	,023	,052	-,012	-,087	,239	-,009	-,080	,100	-,141	-,170	-,531	,846a	-,415
Cognitive_In_5	,025	-,057	-,017	,014	-,090	-,115	-,001	-,100	-,035	,137	,003	-,044	,003	,088	-,121	-,057	-,115	-,128	-,415	,926a

a. MSA

B.3. Eigenvalues and sum of squares

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7,968	39,839	39,839	7,968	39,839	39,839	3,497	17,483	17,483
2	2,406	12,031	51,870	2,406	12,031	51,870	3,487	17,434	34,917
3	1,761	8,805	60,676	1,761	8,805	60,676	3,448	17,240	52,157
4	1,534	7,670	68,345	1,534	7,670	68,345	3,238	16,188	68,345
5	,717	3,583	71,929						
6	,628	3,142	75,070						
7	,605	3,026	78,096						
8	,550	2,752	80,848						
9	,478	2,390	83,239						
10	,438	2,192	85,431						
11	,422	2,112	87,543						
12	,387	1,934	89,477						
13	,362	1,809	91,287						
14	,347	1,737	93,024						
15	,317	1,583	94,607						
16	,275	1,374	95,981						
17	,237	1,187	97,168						
18	,218	1,089	98,256						
19	,211	1,055	99,311						
20	,138	,689	100,000						

Extraction Method: Principal Component Analysis.

B.4. Reliability analyses

Dimension	Cronbach's Alpha	Dimension	Cronbach's Alpha	Dimension	Cronbach's Alpha	Dimension	Cronbach's Alpha
Functional	0,846	Cognitive	0,895	Hedonic	0,877	Social	0,88

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Social_In_1	8,69	9,956	,758	,844
Social_In_2	8,87	10,009	,731	,852
Social_In_3	8,94	10,656	,748	,846
Social_In_4	9,48	11,704	,712	,858
Social_In_5	9,58	11,843	,649	,869

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Functional_In_1	11,46	10,786	,529	,846
Functional_In_2	10,94	9,512	,713	,798
Functional_In_3	10,72	9,523	,719	,797
Functional_In_4	11,10	10,123	,659	,814
Functional_In_5	10,82	9,760	,651	,816

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Hedonic_In_1	12,06	11,687	,669	,860
Hedonic_In_2	11,85	12,162	,651	,864
Hedonic_In_3	12,27	11,446	,742	,842
Hedonic_In_4	12,31	11,348	,744	,842
Hedonic_In_5	12,29	11,311	,732	,845

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Cognitive_In_1	9,53	10,663	,623	,899
Cognitive_In_2	10,08	10,762	,693	,882
Cognitive_In_3	9,85	10,193	,788	,861
Cognitive_In_4	9,86	9,708	,839	,849
Cognitive_In_5	9,87	10,391	,775	,864

B.5. Matrix weights for summation

Component Score Coefficient Matrix

	Component			
	1	2	3	4
Social_In_1	-,037	,001	,248	-,043
Social_In_2	-,097	,029	,248	-,010
Social_In_3	-,010	-,041	,257	-,029
Social_In_4	-,046	-,094	,303	,000
Social_In_5	-,025	-,151	,316	,015
Functional_In_1	-,075	,019	-,041	,240
Functional_In_2	-,043	-,114	,004	,329
Functional_In_3	-,031	-,076	-,019	,306
Functional_In_4	-,061	-,016	,012	,254
Functional_In_5	-,071	-,024	-,005	,275
Hedonic_In_1	-,097	,234	,015	,007
Hedonic_In_2	-,087	,308	-,056	-,045
Hedonic_In_3	-,037	,274	-,054	-,030
Hedonic_In_4	-,013	,260	-,074	-,013
Hedonic_In_5	,010	,295	-,092	-,073
Cognitive_In_1	,216	,093	-,084	-,094
Cognitive_In_2	,256	-,111	-,005	,020
Cognitive_In_3	,305	-,006	-,072	-,080
Cognitive_In_4	,334	-,096	-,029	-,052
Cognitive_In_5	,282	-,066	-,016	-,036

Extraction Method: Principal Component Analysis.

C. Factor analysis online propensity

C.1. Global MSA and Bartlett's test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,604
Bartlett's Test of Sphericity	Approx. Chi-Square	218,619
	df	28
	Sig.	,000

C.2. Individual MSA

Anti-image Correlation

|								
OnOff_Novel_1	,636[a]	,187	-,327	-,345	-,066	,011	,155	-,071
OnOff_Novel_2	,187	,586[a]	-,024	-,083	-,351	,101	-,095	-,080
OnOff_Novel_3	-,327	-,024	,608[a]	,136	-,016	-,215	,013	-,232
OnOff_Hardware_1	-,345	-,083	,136	,565[a]	,189	-,346	,062	,123
OnOff_Hardware_2	-,066	-,351	-,016	,189	,538[a]	-,064	-,075	,111
OnOff_Hardware_3	,011	,101	-,215	-,346	-,064	,643[a]	,121	-,221
OnOff_1	,155	-,095	,013	,062	-,075	,121	,712[a]	-,189
OnOff_2	-,071	-,080	-,232	,123	,111	-,221	-,189	,531[a]

a. Measures of Sampling Adequacy(MSA)

C.3. Eigenvalues and sum of squares

	Total Variance Explained								
	Initial Eigenvalues			Loadings			Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2,289	28,607	28,607	2,289	28,607	28,607	1,822	22,772	22,772
2	1,440	18,006	46,613	1,440	18,006	46,613	1,607	20,083	42,855
3	1,075	13,441	60,055	1,075	13,441	60,055	1,376	17,199	60,055
4	,864	10,797	70,852						
5	,728	9,097	79,948						
6	,653	8,168	88,116						
7	,565	7,058	95,174						
8	,386	4,826	100,000						

Extraction Method: Principal Component Analysis.

D. Scatterplots
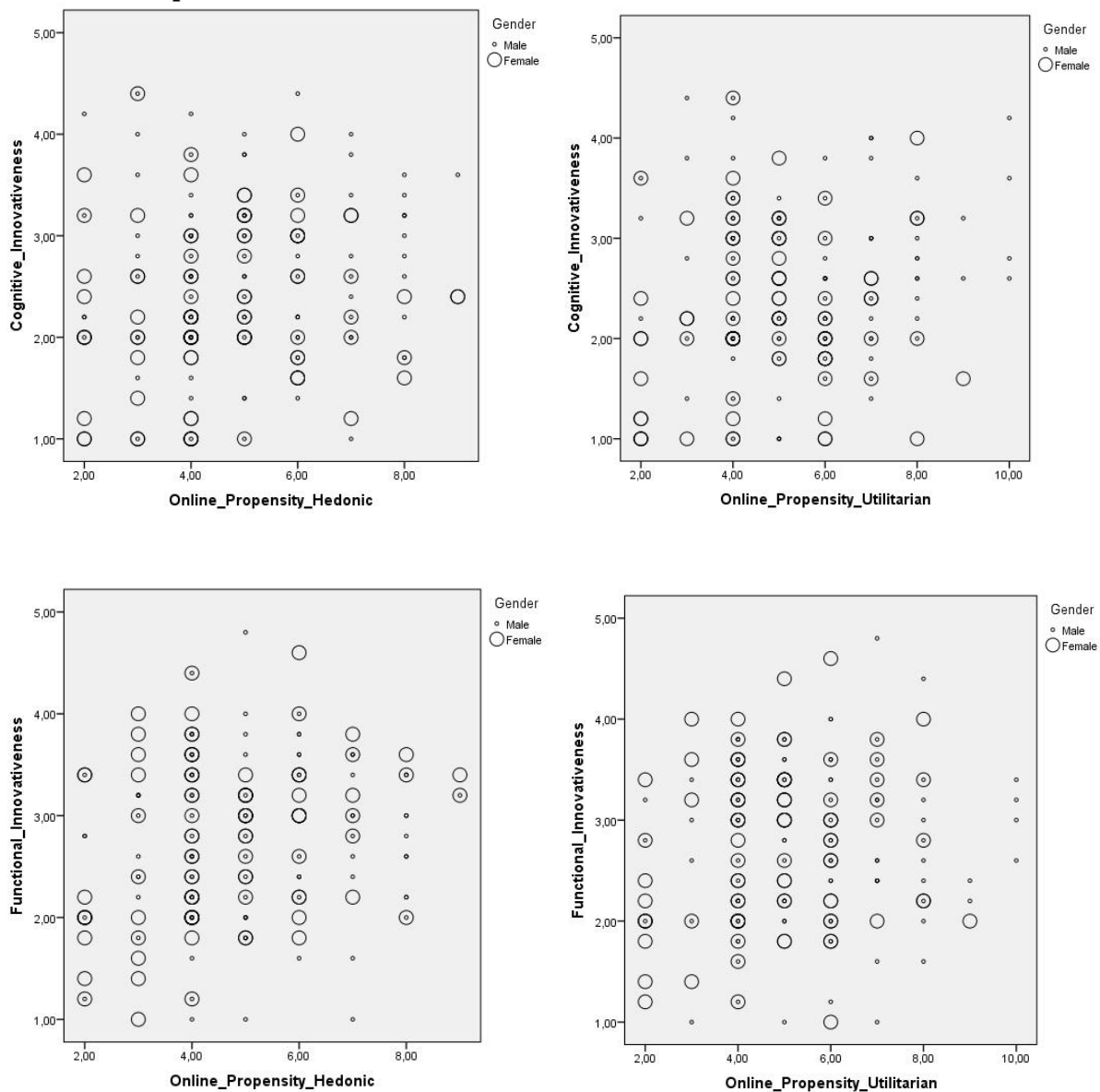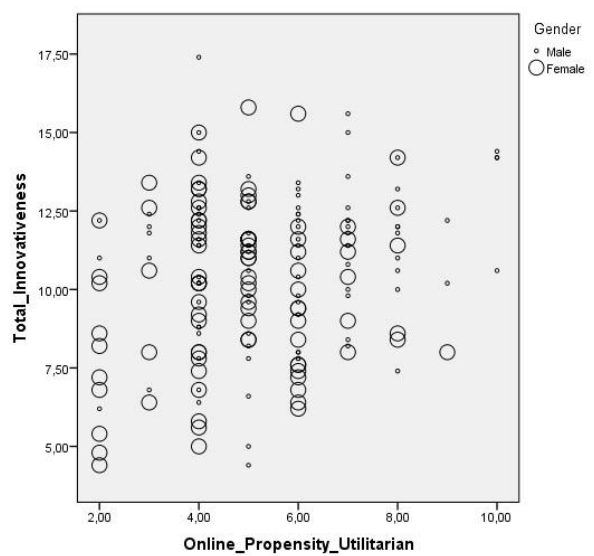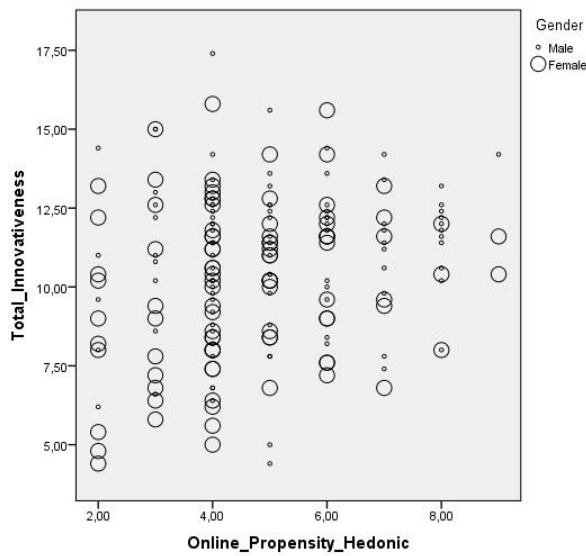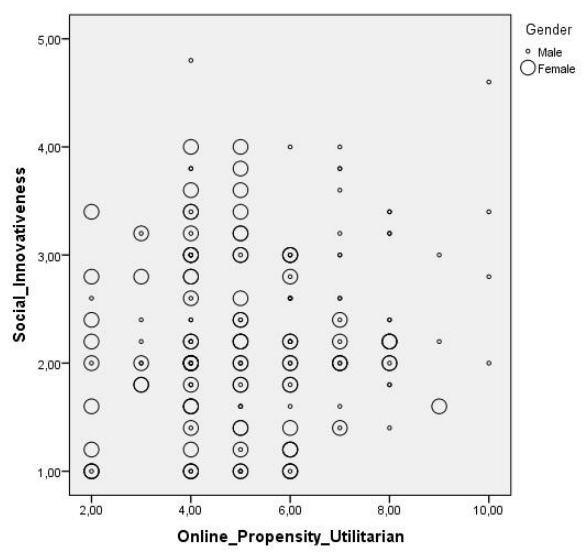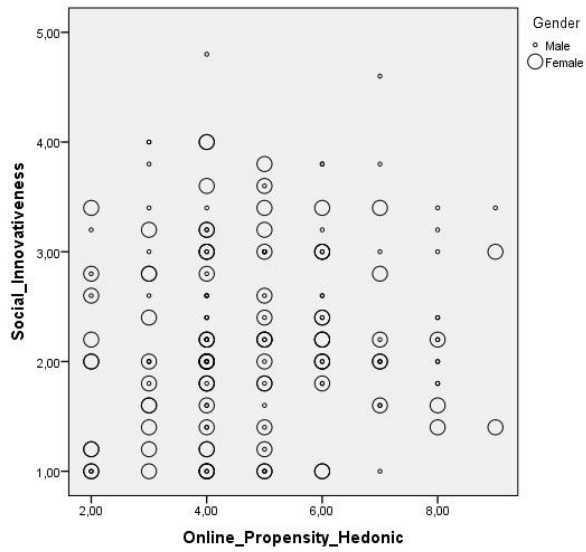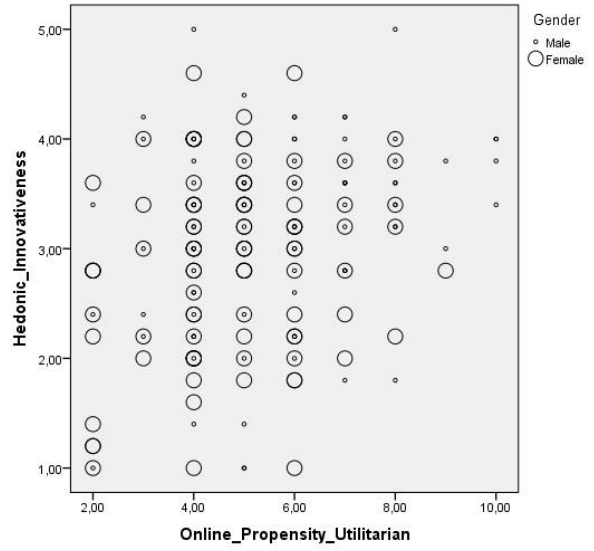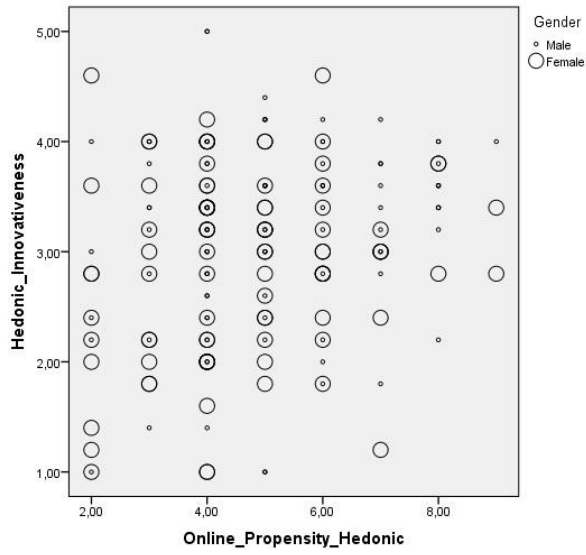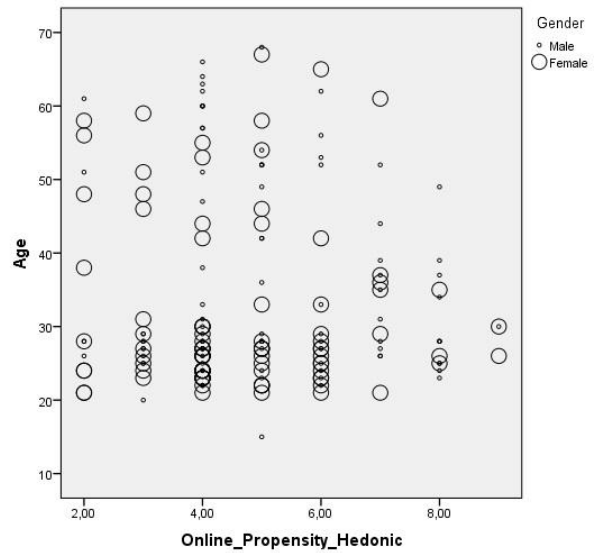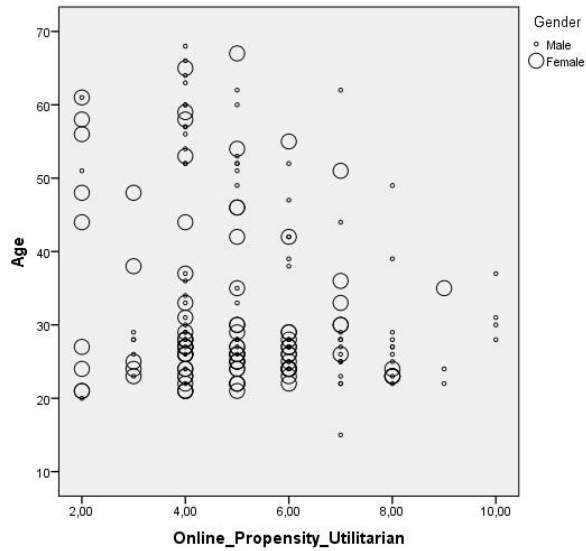
E. Regression Analysis

E.1. Online Propensity Hedonic

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,232[a]	,054	,034	1,64088

a. Predictors: (Constant), Cognitive_Innovativeness, Social_Innovativeness, Functional_Innovativeness, Hedonic_Innovativeness

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	29,143	4	7,286	2,706	,032[b]
	Residual	511,575	190	2,693		
	Total	540,718	194			

a. Dependent Variable: Online_Propensity_Hedonic

b. Predictors: (Constant), Cognitive_Innovativeness, Social_Innovativeness, Functional_Innovativeness, Hedonic_Innovativeness

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,301	,526		6,282	,000
	Social_Innovativeness	-,094	,177	-,045	-,530	,597
	Functional_Innovativeness	,270	,180	,125	1,493	,137
	Hedonic_Innovativeness	,350	,186	,176	1,883	,061
	Cognitive_Innovativeness	-,030	,188	-,014	-,159	,874

a. Dependent Variable: Online_Propensity_Hedonic

E.2. Online Propensity Hedonic extended

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,251[a]	,063	,033	1,63805

a. Predictors: (Constant), Age, Cognitive_Innovativeness, Gender, Social_Innovativeness, Functional_Innovativeness, Hedonic_Innovativeness

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33,615	6	5,603	2,088	,057[b]
	Residual	499,079	186	2,683		
	Total	532,694	192			

a. Dependent Variable: Online_Propensity_Hedonic

b. Predictors: (Constant), Age, Cognitive_Innovativeness, Gender, Social_Innovativeness, Functional_Innovativeness, Hedonic_Innovativeness

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,181	,875		4,779	,000
	Social_Innovativeness	-,100	,177	-,049	-,564	,574
	Functional_Innovativeness	,304	,183	,141	1,660	,099
	Hedonic_Innovativeness	,297	,197	,150	1,506	,134
	Cognitive_Innovativeness	-,079	,191	-,038	-,412	,681
	Gender	-,399	,251	-,120	-1,592	,113
	Age	-,002	,010	-,017	-,218	,828

a. Dependent Variable: Online_Propensity_Hedonic

E.3. Online Propensity Utilitarian

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,263[a]	,069	,050	1,73602

a. Predictors: (Constant), Cognitive_Innovativeness, Social_Innovativeness, Functional_Innovativeness, Hedonic_Innovativeness

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42,587	4	10,647	3,533	,008[b]
	Residual	572,613	190	3,014		
	Total	615,200	194			

a. Dependent Variable: Online_Propensity_Utilitarian

b. Predictors: (Constant), Cognitive_Innovativeness, Social_Innovativeness, Functional_Innovativeness, Hedonic_Innovativeness

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,538	,556		6,364	,000
	Social_Innovativeness	-,007	,187	-,003	-,035	,972
	Functional_Innovativeness	-,038	,191	-,016	-,197	,844
	Hedonic_Innovativeness	,565	,197	,266	2,869	,005
	Cognitive_Innovativeness	,026	,199	,012	,132	,895

a. Dependent Variable: Online_Propensity_Utilitarian

E.4. Online Propensity Utilitarian extended

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,389^a	,152	,124	1,64665

a. Predictors: (Constant), Gender, Functional_Innovativeness, Age, Social_Innovativeness, Cognitive_Innovativeness, Hedonic_Innovativeness

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	90,176	6	15,029	5,543	,000^b
	Residual	504,331	186	2,711		
	Total	594,508	192			

a. Dependent Variable: Online_Propensity_Utilitarian

b. Predictors: (Constant), Gender, Functional_Innovativeness, Age, Social_Innovativeness, Cognitive_Innovativeness, Hedonic_Innovativeness

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6,575	,880		7,476	,000
	Social_Innovativeness	-,044	,178	-,021	-,250	,803
	Functional_Innovativeness	,052	,184	,023	,283	,778
	Hedonic_Innovativeness	,330	,198	,158	1,665	,098
	Cognitive_Innovativeness	-,020	,192	-,009	-,102	,919
	Age	-,032	,010	-,231	-3,158	,002
	Gender	-,854	,252	-,243	-3,388	,001

a. Dependent Variable: Online_Propensity_Utilitarian

E.5. Online Propensity Total

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,331[a]	,110	,084	1,64911

a. Predictors: (Constant), Online_Propensity_Utilitarian_x_Cognitive_Innovativeness, Age, Functional_Innovativeness, Gender, Social_Innovativeness, Cognitive_Innovativeness, Hedonic_Innovativeness, Online_Propensity_Utilitarian_x_Social_Innovativeness, Dummy_Online_Propensity, Online_Propensity_Utilitarian_x_Function_Innovativeness, Online_Propensity_Utilitarian_x_Hedonic_Innovativeness

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	85,771	9	9,530	3,340	,001[b]
	Residual	1084,188	380	2,853		
	Total	1169,959	389			

a. Dependent Variable: Online_Propensity

b. Predictors: (Constant), Online_Propensity_Utilitarian_x_Cognitive_Innovativeness,

Social_Innovativeness, Functional_Innovativeness, Cognitive_Innovativeness,

Hedonic_Innovativeness, Online_Propensity_Utilitarian_x_Social_Innovativeness,

Dummy_Online_Propensity, Online_Propensity_Utilitarian_x_Function_Innovativeness,

Online_Propensity_Utilitarian_x_Hedonic_Innovativeness

Coefficients[a]

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1 (Constant)	5,252	,727		7,224	,000
Dummy_Online_Propensity	,252	,750	,073	,336	,737
Social_Innovativeness	-,109	,178	-,051	-,612	,541
Functional_Innovativeness	,340	,183	,153	1,859	,064
Hedonic_Innovativeness	,194	,193	,094	1,004	,316
Cognitive_Innovativeness	-,079	,191	-,036	-,413	,680
Gender	-,626	,178	-,182	-3,510	,001
Age	-,017	,007	-,126	-2,383	,018
Online_Propensity_Utilitarian_x_Social_Innovativeness	,074	,251	,055	,293	,770
Online_Propensity_Utilitarian_x_Function_Innovativeness	-,325	,257	-,280	-1,263	,207
Online_Propensity_Utilitarian_x_Hedonic_Innovativeness	,240	,265	,227	,903	,367
Online_Propensity_Utilitarian_x_Cognitive_Innovativeness	,059	,267	,046	,221	,825

a. Dependent Variable: Online_Propensity