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Master Thesis

“The effect of choice complexity on willingness to buy in an e-commerce electronics environment”

Business and Economics

Master Marketing

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Table of contents

1. Introduction	4
<i>1.1 Problem statement</i>	5
<i>1.2 Relevance</i>	6
1.2.1 Managerial relevance	6
1.2.2 Academic relevance	6
<i>1.3 Thesis structure</i>	8
2. Theory	9
<i>2.1 Review of Literature</i>	9
2.1.1 Online shopping environment and behavior	9
2.1.2 Consumers' decision making in online settings	10
2.1.3 The e-commerce consumer electronics industry	12
2.1.4 Choice Complexity	13
2.1.5 Cross-selling, upselling	14
2.1.6 The effect of feelings or emotions on decisions	15
2.1.7 Conclusion of literature review	16
<i>2.2 Hypotheses</i>	18
<i>2.3 Conceptual model</i>	19
2.3.1 Explanation of the conceptual model	19
3. Research methodology	20
<i>3.1 Introduction</i>	20
<i>3.2 Research strategy</i>	20
<i>3.3 Research method</i>	20
<i>3.4 Research approach</i>	21
<i>3.5 Data collection method and tools</i>	21
<i>3.6 Sample selection</i>	22
<i>3.7 Research process</i>	23
<i>3.8 Data analysis</i>	23

3.9	<i>Ethical considerations</i>	23
3.10	<i>Research limitations</i>	24
3.11	<i>Conditions</i>	24
4.	Results	25
4.1	<i>Data description</i>	25
4.1.1	Total respondents	25
4.1.2	Gender	26
4.1.3	Age	26
4.1.4	Income	26
4.1.5	Level of education	26
4.1.6	Students	27
4.1.7	Nationality	27
4.1.8	Country of residence	27
4.1.9	Experience with online shopping	27
4.2	<i>Dependent and independent variables</i>	27
4.2.1	Dependent variable	28
4.2.2	Independent variables	28
4.3	<i>Factor Analysis</i>	29
4.3.1	Cronbach's Alpha	30
4.4	<i>ANOVA-analysis</i>	30
4.5	<i>Regression analysis</i>	30
4.5.1	Regression formula	31
4.5.2	Description of important beta values	32
4.6	<i>Moderation analysis</i>	33
4.6.1	Complementary or similar products moderation analysis	33
4.6.2	Complexity medium moderation analysis	33
4.6.3	Complexity high moderation analysis	33
4.7	<i>Mediation analysis</i>	34
4.7.1	Mediation analysis complexity	34
4.7.2	Mediation analysis complementary	34

5. General discussion	35
<i>5.1 Outcome of the hypotheses</i>	35
<i>5.2 Academic and managerial implications</i>	37
<i>5.3 Limitations and further research</i>	38
References	40
Appendix A: Questionnaire design	46
Appendix B: Conditions	49
Appendix C: Results	52
<i>Data description</i>	52
<i>Independent and dependent variables</i>	56
<i>Factor analysis</i>	59
<i>ANOVA analysis</i>	62
<i>Regression analysis</i>	63
<i>Moderation analysis</i>	67
<i>Mediation analysis</i>	70

1. Introduction

The consumer electronics industry is a large and growing market. The revenue in the Consumer Electronics segment has reached \$384,016m in 2020. Revenue is expected to show an annual growth rate of 4.9% in the next five years. Also, sales through online channels are becoming more important. In the Consumer Electronics segment, 39% of total market revenue will be generated through online sales by 2023 (Consumer electronics worldwide, 2020). Several reasons for the growth of the segment are that the electronics industry has shifted from professional use to personal use (Preeti Wadhvani, 2020). When that happened, the consumer electronics industry grew fast. Products were evolving fast and were also offered for the middle class. And still, there is space for innovations and new brands to be successful (Market overview, 2020).

However, the industry has faced heavy problems due to the outbreak of COVID-19. China has been hit hard by the virus and is the largest producer, exporter, and consumer of consumer electronics. The shutdown of the production in China has forced other consumer electronics makers based in the US and Europe to temporarily hold the production of the finished goods. This led to an increase in the supply and demand gap. Besides that, China and several other major economies including the US, Japan, and Italy were under pressure of COVID-19 and so is their consumer electronic industry. Retail shops and showrooms of major brands, supermarkets, and hypermarkets have been shut down for a definite period affecting sales of various consumer electronics products (Impact of COVID 19 on Consumer Electronics Market, 2020). Despite these problems, the market is expected to continue growing. Due to COVID-19, the online sales channels have become more important for consumers.

Not more than ten years ago, consumers would not have bought their electronics online. It is quite a big investment for many people and people must be confident that they will receive their product safely at home. Amazon, and in the Netherlands bol.com and Coolblue have changed consumer expectations. They won consumer trust by fast shipping and excellent customer service (The Amazon Effect: How Customer Expectations Have Impacted the Supply Chain, 2018). They are now a few of the largest e-commerce platforms and sellers of consumer electronics. (Bol.com, again the biggest online store in the Netherlands, 2018)

As a fanatic online shopper, it always interests me how online retailers offer me something that I might also like. Sometimes online retailers show related products, and others offer similar

products. With this thesis, the researcher wants to investigate how cross-selling can best be used in consumer electronics e-commerce, so that online electronics retailers can optimize the number of products purchased per order.

1.1 Problem statement

This paper investigates the effect of choice complexity on the willingness to buy in the e-commerce electronics branch. In this paper, choice complexity is divided into two terms: the number of products that are shown to the customer and the fact that these products are either complementary or similar.

The main research question of this thesis is as follows:

‘‘Does the choice complexity affect the willingness to buy of consumers who are shopping electronics online?’’

Guessing it could be that showing complementary products could lead to cross-selling and an increase in the willingness to buy. Of course, it can also be the case that it scares customers off to buy the products and think 'they just want to sell me extra products', which damages customer confidence and trust. Showing comparable products can make cross-selling more difficult, but the customer might feel some kind of objectivity of the selling website, who wants customers to be able to compare their electronics more easily. Also, the number of suggested products that are shown might influence the willingness to buy. Showing a lot of options (especially to inexperienced online shoppers) might scare customers off. When there is an overload of options it might cause stress in the customer's mind and affect the willingness to buy. Though when there are 'too few' options are presented it might seem that the range of choice is minimal, which might cause a lower willingness to buy.

Some sub-questions have been formulated to answer the research question. These sub-questions are:

1. What is the effect of the number of alternatives shown on the willingness to buy?
2. Do the feelings of the respondents during the experiment have a mediating effect between the number of alternatives shown and the willingness to buy?

3. Are there any moderating effects (of age, experience with online shopping, being a student or level of trust of the website) between the number of alternatives shown and the willingness to buy?
4. What is the effect of showing similar or complementary alternatives on the willingness to buy?
5. Do the feelings of the respondents during the experiment have a mediating effect between showing similar or complementary alternatives and the willingness to buy?
6. Are there any moderating effects (of age, experience with online shopping, being a student or level of trust of the website) between showing similar or complementary alternatives and the willingness to buy?

1.2 Relevance

1.2.1 Managerial relevance

This study is relevant for managers and businesses, especially for marketing managers in the business of e-commerce electronics. The willingness to buy is of course very important to the number of sales that will be made on any website. Especially when there is a lot of competition in an industry. Designing a pleasant and user-friendly website and product-page must be of big importance to marketers who are in e-commerce. The items that are offered under the product that a user is looking at are important. As mentioned earlier, this paper will investigate the most effective way to show these product options under the main product on the product page. This paper will tell if it is better to show many or few products and if it is better to list similar or complementary products.

1.2.2 Academic relevance

In this paper, the author will test some theories for the e-commerce electronics industry. Of course, there has been done relevant studies on this topic, but this paper will answer some questions that have not been addressed in previous research.

The study from Colleen Lerro, 2008 confirms that accessories can be an effective tool in the electronics market for more cross-selling, upselling, and bundling. This is becoming more and more important in the online electronics market (Lerro, 2008). Showing complementary products will also be done in this study, not particularly to cross-sell or upsell, but to measure the effect of showing complementary products on the willingness to buy from the website.

There are also some studies about the importance of pricing in cross-selling and upselling or giving a bundled discount. For example, the study from Goker Aydin and Serhan Ziya in 2008, which states that setting the price dynamically has the best effect on sales (Goker & Serhan, 2008). In this study, the price or discount has no role in the effect of whether the customer wants to buy something. The only thing that will be considered in this study is the number of options given and the type of option given, similar or complementary.

The study from Knott in 2002 presents 'next product to buy models' for improving the effectiveness of cross-selling. This study is to reduce poorly targeted cross-selling activities by predicting the product each customer would be most likely to buy next. (Knott, Hayes, & Neslin, 2002). The study from Knott is very interesting. The right selection of complementary products might affect the willingness to buy. Though, in this study, there is no system or model used to select the right complementary products. Only the difference between complementary or similar products will be tested. The complementary products will be the same for every respondent, no differences will be made there.

Researchers Haubl and Trifts conducted a very interesting study on consumer decision-making in online environments, which is very similar to the aspect of this research to be investigated: willingness to buy in an online environment. This study suggested that interactive tools designed to assist consumers in the initial screening of available alternatives have strong beneficial effects on both the quality and efficiency of purchase decisions. Consumers can make good decisions with significantly less effort. This showed that interactive decision aids, such as displaying similar products below the desired product page, had the potential to change the way people search for product information and make purchase decisions (Häubl & Trifts, 2000). Haubl and Trifts have thus shown that customers should be given an easy way to compare products in order to favor the quality of the choice. In this paper, this will therefore be showing similar products. But does this also affect the willingness to buy of the initial product?

Also, in 2006, Iyengar and Kamenica prove through the 'Contextual inference theory' that an individual presented with many options will be more disposed to choose simpler alternatives, meaning those alternatives whose utility is more transparent to the decision-maker (Iyengar & Kamenica, 2006). This says nothing about the willingness to buy when showing a large or small number of options. This just shows that a simple option is chosen when options are abundant. The quality of the choice will probably be less than if someone has fully immersed himself in

the options, but in this paper, the author will discuss the choice complexity and its effect on the willingness to buy.

While these various variables have been included in some way in previous studies, they have not been applied in the way this paper will examine them. Namely, much is known about how people make choices and choice complexity, even in online environments, but it has not yet been shown what the effect of this is on the willingness to buy. Especially not in the e-commerce electronics market.

1.3 Thesis structure

The structure of this paper is as follows. First, in chapter 2, relevant existing literature on the research topic is reviewed. Also, the hypotheses will be formulated, and the conceptual model of this research will be presented. Chapter 3 is devoted to the methodology of the research; it explains how the research will be and the questionnaire will be clarified. In chapter 4 the results of the quantitative research will be discussed. Different statistical tests will be used to accept or reject the different hypotheses that have been composed in chapter 2. At last, chapter 5 presents the discussion of the main results followed by a general conclusion. Also, the academic and managerial implications, limitations, and recommendations for future research will be discussed.

2. Theory

2.1 Review of Literature

There is no denying that the e-commerce market is still growing strongly. The revenue in the e-commerce market is projected to reach US\$2,723,991m in 2021. The revenue is expected to show an annual growth rate) of 6.29% from 2021 till 2025, resulting in a projected market volume of US\$3,477,296m by 2025. User penetration will be 50.8% in 2021 and is expected to hit 63.1% by 2025. The average revenue per user is expected to amount to US\$714.11. (E-commerce worldwide, 2021)

Many consumers use interactive media to compare or buy products. At the beginning of the 21st century, little was known about consumer behavior in online environments. Because the e-commerce market was still emerging. Nevertheless, several studies on online behavior had been done before that time. For example, in 1980 a study was done that proved that intrinsic motivation and long-term commitment make experiential consumers more likely to be loyal than goal-oriented consumers. It turns out that people who surf the web without a purpose are more impulsive and more likely to make a purchase (Bellenger & Korgaonkar, 1980).

Later, in 2000, researchers Haubl and Trifts conducted a very interesting study on consumer decision-making in online environments, which is very similar to the aspect of this research to be investigated: willingness to buy in an online environment. After this interesting research, very little research has been done on this topic and this particular industry of e-commerce electronics. Therefore, the author will also discuss and evaluate studies and theories on other related and relevant topics such as choice complexity, product recommendations, choice architecture, and cross-selling.

2.1.1 Online shopping environment and behavior

When we talk about online purchase intention, previous research shows that several influences are important. First, consumer trust, perceived usefulness, and perceived ease of use appear to be the most explanatory factors for certain intended behavior. This study also proves that online trust is built, among other things, by the belief that security mechanisms are built into the website and by having a typical interface, which is easy to use. Thus, safety mechanisms and an easy-to-use interface of a website appear to be important for consumer trust and thus for behaviors such as a purchase or an intention to buy (Gefen, Karahanna, & Straub, 2003).

Trust has been found to play a central role in Internet purchasing behavior and it influences behavioral intentions (Cho, 2006); (Kim & Lee, 2008). In addition, consumers prefer clear information, delivery guarantees, and easy navigation on company websites (Xia & Sudharshan, 2002); (Schiffman, Sherman, & Long, 2003); (Lee & Lee, 2004); (Page-Thomas, Moss, Chelly, & Yabin, 2006). The website itself and the reputation of the company is also an important antecedent of online buying behavior (Venkatesh & Agarwal, 2006).

Other studies have shown that better quality of the website, may help consumers to complete transactions smoothly and induce them to revisit the online store. Poorer quality, on the other hand, would hinder their online shopping behavior (Li & Zhang, 2002). Consistent with the literature and models on attitude change and behavior (Fishbein & Ajzen, 1975), it is hypothesized that consumers' attitudes affect their intention to store online and ultimately whether a transaction is concluded (Li & Zhang, 2002).

Thus, the key to success in the Internet business lies in establishing trusted transaction processes where online sellers create an environment where a potential consumer can be relaxed and confident about any future transactions (Grabosky, 2001).

“The level of trust of the website has a positive effect on the willingness to buy.”

2.1.2 Consumers' decision making in online settings

The success of the internet business will be when you have found consumer trust and have a quality website with an easy interface (Dan, Donald, Ferrin, & Raghav, 2008). This is largely within your control as an online store. However, there are psychological factors that play out in the minds of consumers when they are in an online environment.

The online experience is an important issue that affects online shopping behavior. Online experience during online shopping appears to be an important determinant of whether online navigation will lead to a successful purchase transaction (Zhou, Dai, & Zhang, 2007).

It also appears that consumers' intention to shop online is positively related to their attitudes toward Internet purchases and influences their decision-making and purchasing behavior (Li & Zhang, 2002). Consumers' intention to store online refers to their willingness to make purchases

from an Internet store. Usually, this factor is measured by consumers' willingness to buy and to return for additional purchases. The latter also contributes to customer loyalty (Jarvenpaa, Tractinsky, & Vitale, 2000).

Most consumers form expectations about the product, seller, service, and quality of the website they visit before shopping online. These expectations influence their attitudes and intentions to store at a particular online store and affects their decision-making process and purchase behavior. When expectations are met, customers achieve a high level of satisfaction, which positively influences their attitudes, intentions, decisions and purchasing activities when shopping online. In contrast, dissatisfaction is negatively associated with these four variables (Ho & Wu, 1999); (Jahng, Jain, & Ramamurthy, 2001); (Kim, Eom, & Yoo, 2001).

In several studies, students are considered a highly relevant population because they tend to be familiar with a variety of emerging Internet formats (Dabholkar, van Dolen, & de Ruyter, 2009). The latter is evident from Lim and Dubinsky's (Lim & Dubinsky, 2005) that university students deserve attention from e-retailers because of their significant numbers in a cyber world.

According to Häubl and Trifts (2000), potential consumers appear to use a two-stage process to arrive at purchase decisions. Initially, consumers screen many products to identify a subset of promising alternatives that appear to meet their needs. They then evaluate this subset more thoroughly, perform relative comparisons between products based on several desirable attributes, and make a purchase decision. Using a controlled experiment, these authors discover that interactive tools designed to assist consumers in the initial screening of available alternatives and to facilitate in-depth comparisons among selected alternatives in an online shopping environment can have strong beneficial effects on both the quality and efficiency of purchase decisions (Häubl & Trifts, 2000).

Online experience and consumers' intention to shop online appear to be important factors in willingness to buy. Customers set expectations of the product and the website, and if these expectations are met, it has a positive impact on the decision process. Several studies consider students as a relevant target group. In this study, the author will survey a broad target group and see if students are an additional interesting target group. Consumers make a screening in an online shopping environment where they evaluate interesting products. Online decision aids such as showing similar products under a product page would have beneficial effects on the

quality and efficiency of purchase decisions. In this study, the author will examine whether showing similar products contributes to the willingness to buy.

“Students have a higher willingness to buy.”

“Age has an effect on the willingness to buy.”

“Experienced online shoppers have a higher willingness to buy.”

2.1.3 The e-commerce consumer electronics industry

The e-commerce market became popular in the late 19th century, early 20th century. At the end of the 19th century, we were a lot of studies on e-commerce. Many companies were concerned about various social, legal, business, and regulatory aspects that could affect the adaption of e-commerce (Borenstein, 1998). Many companies were afraid of this new market because they had little experience with e-commerce (Stahl, 1997). During this time, it was determined which companies developed quickly and which lagged. Many consumers were concerned about privacy in e-commerce (Kovacich, 1998); (Monahan, 1998). But companies were concerned too because there was little well-accepted or understood e-cash at the time (ter Maat, 1997).

In this thesis, the author delves into the consumer electronics segment of e-commerce. This segment which accounts for about 15% of the total e-commerce market is expected to reach \$415,897 million in revenue by 2021. Revenues are expected to show an annual growth rate of 4.03%, resulting in a projected market volume of \$487,191 million by 2025. The average revenue per user is expected to reach US\$218.90 (Consumer electronics worldwide, 2020). The Consumer Electronics Association (CEA) is projecting nearly \$1.2 billion in only wireless accessories shipments for 2008 (Lerro, 2008).

It will continue to be a growing and therefore an interesting market for entrepreneurs to delve into. Thus, we have already seen that several factors are important for consumer decision-making in an online environment, such as consumer trust, a good quality website interface, and the online experience. In addition, consumers’ attitudes, willingness to buy, and expectations also greatly influence purchase activities when shopping online. These can influence purchasing activities positively or negatively, but what about the segment the author focusing on, the consumer electronics in e-commerce?

A 2000 study by Gerald Häubl and Valerie Trifts on consumer decision-making in online shopping environments (Häubl & Trifts, 2000) suggests that interactive tools designed to assist consumers in the initial screening of available alternatives and to facilitate in-depth comparisons among selected alternatives in an online shopping environment have strong beneficial effects on both the quality and efficiency of purchase decisions. Consumers can make good decisions with significantly less effort. This showed that interactive decision aids, such as displaying similar products below the desired product page, had the potential to forever change the way people search for product information and make purchase decisions.

2.1.4 Choice Complexity

In the literature that deals with assessment and decision making, much attention has been paid to identifying strategies that have been used by people and organizations to make decisions (Bettman, Johnson, & Payne, 1991); (Payne, Bettman, & Johnson, 1993). Other researchers were concerned with mathematical models of decision making strategies (Dawes, 1964)), such as the satisficing (Simon, 1955) and elimination-by-aspects (Tversky A. , 1972).

Other researchers who were engaged in the judgment and decision-making literature sought evidence for the use of compensatory and non-compensatory decision strategies. Examples include task complexity and context change (Ball, 1997; Payne et al., 1993; (Russo, Doshier, & Doshier, 1983).

In related research, there is evidence that people adapt their decision strategies to specific situations and environments see, for example, (Payne J. W., 1982). The idea that people settle for imperfect accuracy in their decisions in exchange for a reduction in effort is also well supported (Bettman, Payne, & Johnson, 1990); (Johnson & Payne, 1985). Because of this trade-off between effort and accuracy, decision-makers often choose options that are satisfactory but would not be optimal in the absence of decision costs. This occurs especially when there are many alternatives or when the alternatives are difficult to compare, that is when the complexity of the decision environment is high (Payne, Bettman, & Johnson, 1993). Also, in 2006, Iyengar and Kamenica prove through Contextual inference theory that an individual presented with many options will be more inclined to choose simpler alternatives, i.e., those alternatives whose utility is more transparent to the decision-maker (Iyengar & Kamenica, 2006). Another recent analysis showed that behavioral involvement (buying) initially increased with the number of options but decreased when even more options were presented (Shah & Wolford, 2007). There

seems to be a curve, where too little and too much choice leads to wrong decisions or not buying at all.

A 2002 study suggests that complexity is best varied between different survey instruments to find the optimal level of complexity (DeShazo & Fermo, 2002). Therefore, in this research different levels of complexity will be measured, this way the author hopes to discover the curve discussed in the literature and find an optimal point of choice complexity for the market of e-commerce electronics.

While all this literature has established that people use choice strategies depending on a number of factors (product, opportunity, form of information presentation, time constraints, similarity of alternatives, etc.) none of this addresses choice complexity in the online market, much less how choice complexity affects the willingness to purchase electronics in an online environment. For online electronic commerce, the goal of this paper is to examine the extent to which choice complexity affects willingness to buy and the appropriate number of choices to display.

“The number of options shown has an effect on the willingness to buy.”

2.1.5 Cross-selling, upselling

Acquiring potentially valuable customers can be costly and difficult. Particularly in markets where competition is fierce and where switching costs are low. Companies have come to realize that it is easier to maximize profit by cross-selling services to existing customers rather than attracting new ones. Indeed, customer retention is improved by cross-selling multiple products or services, as customer switching costs increase with multiple relationships (Srivastava & Shocker, 1987).

Many online retailers use cross-selling to sell additional products. Cross-selling is encouraging customers of a company, who have already purchased a product, to buy an additional product with it (Deighton, Peppers, & Rogers, 1994); (Nash, 1993). The challenge of cross-selling is knowing which product to target to which customer. Several models have been established for this purpose such as Next-product-to-buy models (Knott, Hayes, & Neslin, 2002). Other researchers call the same phenomenon upselling, so many online retailers use this phenomenon to recommend additional products to customers who have just bought an item or want to buy an item. Traditional retailers are also no strangers to upselling. For example, consider a

salesperson who recommends a tie that matches a shirt you want to buy (Goker & Serhan, 2008).

A good example of cross-selling is showing complementary products on a product page. Think of a sleeve, mouse, or hard drive when you are looking at a laptop. In this paper, the goal is not to cross-sell, but complementary products will be shown on a product page to see what effect they have on the willingness to buy the initial product, such as the laptop in this example.

It has been known that one does not achieve optimality under all circumstances, and in behavioral economics, people often fail to choose optimally (Kahneman & Tversky, Choices, values, and frames, 1984); (Loewenstein & Thaler, 1989). For example, when asked to choose between two items of similar value and a cash payment that is worth less than either of the comparable items, participants often choose cash, possibly to avoid a more difficult decision between two but similar items (Shafir & Tversky, 1995). Will this mean that people stress or find it difficult to make a choice between similar products? In this study, the author will examine whether showing similar or alternative products has a different effect on willingness to buy. The underlying reason that people prefer not to choose between similar items will not become clear in this paper, only the effect.

“Showing similar products has a negative effect on the willingness to buy.”

2.1.6 The effect of feelings or emotions on decisions

Since the plan is to do an experiment to investigate different effects, the emotions, or feelings that respondents experience during the experiment could have an impact on the outcome of the study. Therefore, the author looks at literature to see how this has been experienced in practice.

It has often been studied whether feelings predict choice. We turn to Prospect Theory (Fox & Poldrack, 2014); (Kahneman & Tversky, 1979); (Tversky & Kahneman, 1992). Prospect Theory is not derived by eliciting feelings from people to predict a choice, but rather by observing people's choices to estimate the subjective value associated with possible outcomes. However, an implicit assumption of the theory is that subjective value (utility) is a proxy for feelings, which in turn determine choice; "people described by Prospect Theory are guided by the immediate emotional impact of gains and losses" (Kahneman D., 2011). Although Prospect Theory is one of the most influential theories in economics and psychology, this implicit

assumption has never been empirically tested. Thus, it is not clear if and how feelings drive choice.

Lerner and Keltner (2000, 2001) proposed the Appraisal-Tendency Framework (ATF) as a basis for discerning the effects of specific emotions on judgment and decision making. The ATF assumes that specific emotions give rise to specific cognitive processes that are responsible for the effects of each emotion on judgment and decision-making (Lerner & Keltner, 2001); (Lerner & Tiedens, 2006).

Another study argues that evaluative judgments involve people asking, "How does this make me feel?" (Schwarz & Clore, 2003). By doing so, they may misinterpret their current feelings as a response to the object of evaluation, resulting in more favorable evaluations in positive moods unless their informational value is discredited (Schwarz & Clore, 1996).

It is clear that feelings and emotions can influence the outcome. Maybe a respondent is not feeling well on that day or the contrary, he is very happy, and, in some sense, this influences the outcome. As a result, the author must take the respondent's feelings into account. Therefore, there will be asked about emotions and feelings in the experiment so that when analyzing the results, any overestimation or underestimation of the population can be considered that may have resulted in the experiment due to the emotions of the respondents.

“Respondents with positive feelings or emotions during the experiment have a higher willingness to buy. “

2.1.7 Conclusion of literature review

It can be concluded that much has been researched on various topics regarding e-commerce, choice complexity, choices in online environments and the effect of emotions on making choices. For example, it is clear that the e-commerce market and specifically the e-commerce electronics market will still show growth in the coming years, which makes it interesting to keep investing in this market. Consumer confidence needs to be gained by involving security systems on the website and having an easy-to-use interface for the website. Online experience and consumers' intention to shop online also appear to be important factors in willingness to buy. In addition, there must be considered that when there is a large choice set, customers will choose the easiest option, where utility is most visible. Too many and too few options can lead

to a less efficient choice. The author will have to search for the point where the number of recommended products is optimal. Finally, the author will have to consider customer emotions in the experiment. This is because it has been shown that emotions and feelings can have an effect on the choice a consumer makes and therefore on the outcome of this study.

2.2 Hypotheses

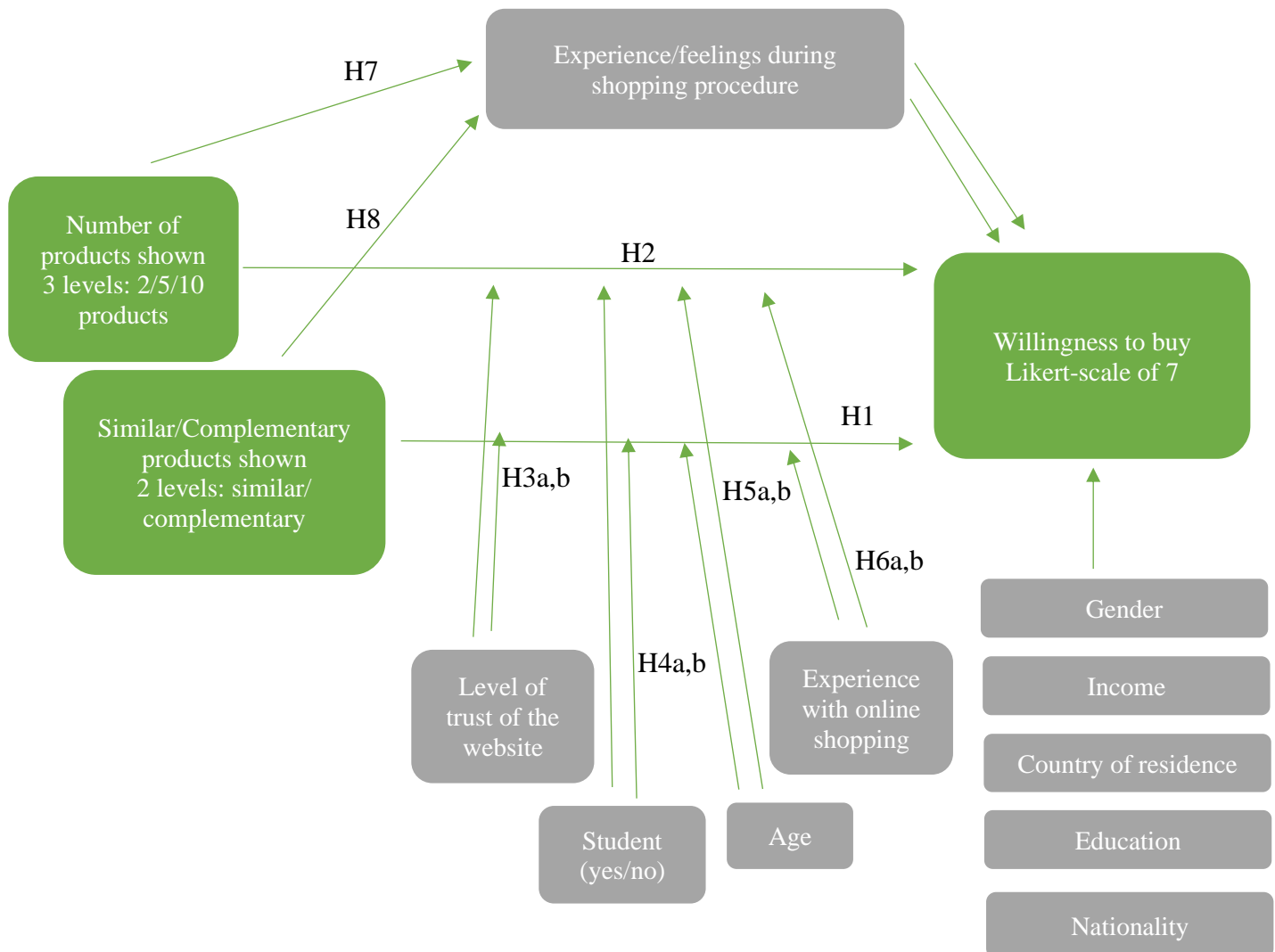
The hypotheses were drawn up in response to the literature found. The hypotheses are incorporated in a conceptual model, see paragraph 2.3, in which the expected effects are indicated by arrows. The hypotheses are also visible in this model.

Table 1: Hypotheses

H1	Showing similar alternatives has a significantly negative effect on the willingness to buy.
H2	The number of alternatives shown has a significant effect on the willingness to buy.
H3a	The number of alternatives shown has a significant effect on the willingness to buy and is moderated by the level of trust of the website.
H3b	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is moderated by the level of trust of the website.
H4a	The number of alternatives shown has a significant effect on the willingness to buy and is moderated by the fact that someone is a student.
H4b	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is moderated by the fact that someone is a student.
H5a	The number of alternatives shown has a significant effect on the willingness to buy and is moderated by age.
H5b	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is moderated by age.
H6a	The number of alternatives shown has a significant effect on the willingness to buy and is moderated by the experience with online shopping.
H6b	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is moderated by the experience with online shopping
H7	The number of alternatives shown has a significant effect on the willingness to buy and is mediated by feelings.
H8	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is mediated by feelings.

2.3 Conceptual model

Figure 1: Conceptual model



2.3.1 Explanation of the conceptual model

The model has two main effects, both related to choice complexity. The first main effect: the number of alternatives shown on the willingness-to-buy. The second main effect: the showing of similar or complementary alternatives on the willingness to buy. Furthermore, a mediator effect is expected by the researcher that could possibly take over the main effects. Also, some moderator variables are expected by the researcher. Namely: the degree of trust in the website, the fact that someone is a student yes or no, the age and the experience with online shopping.

3. Research methodology

3.1 Introduction

This chapter contains the research methodology of the thesis. In this section, the author discusses the research strategy, research method, research approach, data collection methods, sample selection, research sample, type of analysis, any ethical considerations, and research limitations of the study.

3.2 Research strategy

The research conducted as part of this thesis provides new insights into a topic that has already been researched in several respects. There are many pieces of previous academic research on e-commerce and decision making, even in online environments. Yet, this research takes the form of a new study on an existing research topic. The aspect that is primarily new is the aspect of consumer electronics in an online environment. The author assumes that various e-commerce platforms like Amazon have the kind of information that is researched in this paper about their customers but will not share it with competitors, which of course makes sense. However, this has led to the fact that there are no public, academic studies on this particular topic of e-commerce electronics in which this study provides insight.

3.3 Research method

For this study, the author chose to collect quantitative data. The main difference between qualitative and quantitative research is that in qualitative, there is a complete description and analysis provided of a research topic, without limiting the scope of the study and the participant's responses (Collis, Hussey, & Hussey, 2003). However, the effectiveness of qualitative research is limited, and the results may not be considered reliable because they usually come from personal interpretations of the researcher. Also, qualitative research lends itself better to smaller samples. Because of this, the results cannot be seen as reflecting the opinions of a larger population (Marshall, Cardon, Poddar, & Fontenot, 2013). Therefore, the author chose to conduct quantitative research in the form of an online experiment through Qualtrics. The major advantage of quantitative research is that many respondents can participate in the experiment, which allows the author to make statements about a wider population.

The goal of the research is to get a good picture of the effect of choice complexity on willingness to buy. As a result, characteristics have been classified and different statistical models have been used in an attempt to explain what is observed. The researcher knew in advance roughly what she was looking for and had some expectations for the outcomes. All aspects of the study were carefully designed in advance before the data was collected. The researcher used a questionnaire in Qualtrics as a tool to collect data for the experiment. The outcomes are mainly numerical data that were converted into statistics. Subjective person interpretation was virtually nonexistent while analyzing the data. The quantitative data was used to efficiently test hypotheses. Statements were made about the hypotheses and all the variables were examined during the experiment. However, any contextual details may be missed by using the quantitative research method, which is a disadvantage of this research method and may cause the fact that more depth might be needed on certain aspects for any further research (Miles & Huberman, 1994).

3.4 Research approach

The research approach used in this study is the deductive approach. According to this approach, researchers start with existing theories, after which they will be tested whether in a different context or not. This deductive approach was necessary to explain causal relationships between variables. This research approach is best suited for large samples that provide quantitative data. The main weakness of a deductive research approach is that it requires a highly structured approach and a necessary sample size to be able to generalize the results (Soiferman, 2010).

3.5 Data collection method and tools

For this study, an experiment was conducted, a questionnaire with six different treatments was randomly distributed. A between-subjects design is chosen to test the different characters of the independent variables in the same time frame. The data was obtained by sending out the Qualtrics experiment through the authors' own social network. Through family, friends, LinkedIn, Facebook, and WhatsApp groups the experiment has been shared. The goal was to get around 40 respondents per test group. Because this experiment has a 3x2 design, six groups of 40 respondents were needed, which means 240 respondents in total. The entire questionnaire outline can be found in appendix A.

Characteristics of an experiment are randomization, manipulation, control, and causality. All four of these factors had to be met. To ensure randomization, participants were randomly assigned to a condition. Thus, they had an equal chance of ending up in one group or another. Manipulation has been satisfied because the independent variable in the experiment was different for each group. Causality has been measured from the independent variables on the dependent variable and the fact whether the outcomes for the different treatments were different or not. Finally, control is an important term, in this experiment the author ensured this by keeping all variables the same except for the independent variables. The different independent variables were the different conditions.

The advantage of an experiment is that causality can be demonstrated. The disadvantage of this experiment is the limited generalizability to other situations or people (the external validity).

Judgement bias means that people judge differently because they already know what is expected of them. To prevent people from being subject to judgment bias, the conditions for this experiment were assigned in a random and prominent way (Okazaki, Mueller, & Taylor, 2010). The respondent was only able to join the experiment in one condition. So, a between-subjects design was chosen in order to analyze different conditions in the same time frame. The advantages of a between-subjects design are that each outcome is independent of other outcomes, so there are no influences of previous treatments. For example, there is no experience of the exercise, fatigue, boredom, and the contrast between different conditions does not become apparent to the respondents. Some disadvantages of a between-subjects design are that a relatively large number of subjects is needed (the more conditions, the more subjects). Furthermore, each outcome comes from a unique individual, who differs from the other subjects on personal characteristics (individual differences), not all of which has been measured.

3.6 Sample selection

The population of this study is all people, all over the world. There was not necessarily an intention to examine a particular nationality. There was no focus on people who shop a lot online because in the future inexperienced online shoppers may also have to deal with online shopping or any decision-making in online environments as the world becomes more and more digital (Parviainen, Tihinen, Kääriäinen, & Teppola, 2017). Because the author did not have access to any system or email database, she was forced to draw a sample from her own network.

This has created some bias due to her having a certain age, lifestyle, and living in a certain country and area in the Netherlands, which her network was logically be subjected to. Despite this bias, this research provides certain insights that can be generalized to the entire population. Moreover, there have been found more insights than if no study was conducted on this subject.

3.7 Research process

The online questionnaire was sent in April 2021, through the author's own network. Through various social media channels and groups such as Facebook, LinkedIn, and WhatsApp, the questionnaire was shared. A piece of text was composed to digitally ask if the potential respondents would like to participate in the author's thesis research and the topic of the research was briefly mentioned.

While distributing the survey, multiple other biases could occur. For example, non-response bias and common method bias (Suchman, 1962); (Cull, O'connor, Sharp, & Tang, 2005); (Vella, 1998). The researcher guarded for the non-response bias by checking before analyzing the data if there were no missing values to make sure every respondent understood the questions (Suchman, 1962) or did not leave the survey before the last question. Incomplete surveys have not been taken into the analysis. Finally, the researcher protects against common method bias by asking questions using a Likert-scale (Likert, 1932) and a semantic differential scale (MacKenzie & Podsakoff, 2012).

3.8 Data analysis

When a minimum of 40 respondents from each condition had been obtained the data was downloaded. The data was transformed so that it could be analyzed in SPSS. Different analysis techniques have been applied to analyze the data. Think of regression analyses but also logistic regressions, ANOVA, and Chi-square tests. These showed the effect of the independent variables on the dependent variable and whether there is any mediating or moderating effect visible in the data.

3.9 Ethical considerations

The current study was subject to several ethical issues. At the beginning of the questionnaire, it is stated that the participation in the questionnaire is anonymous and that the results of the study would only be used for academic purposes for this thesis report which is only held within

Erasmus University. Because the respondents were sent the questionnaire, they were able to choose whether to participate in the study and they also had the option to stop the survey. In addition to the above, the participants were not harmed physically or psychologically during the conduct of the study. In addition, the researcher tried to make the questionnaire as fine and comfortable as possible.

3.10 Research limitations

As in any study, this one had some limitations. First, the sample size was adequate, yet relatively small, 40 respondents per condition. A larger sample would have been better for the reliability of the study and would allow the researcher to make statements about the entire population with more certainty. In addition, there was some bias, because the respondents are from the author's circle of acquaintances, most of the respondents are from the suburbs and there are more participants of young age. Further, because only quantitative research was done it was not possible to look at the reasoning or underlying thoughts of the respondents.

3.11 Conditions

There are six conditions in this experiment that each respondent could have been exposed to. Each survey participant was randomly assigned one of the six conditions, consisting of a picture of a laptop, with depending on the condition, 2, 5 or 10 complementary or similar products shown under the product (laptop). In condition 1, 10 complementary products are shown as product recommendations under a laptop. In condition 2, 5 complementary products are displayed and in condition 3, 2 complementary products are displayed. In condition 4, 10 similar products are presented on the product page under the laptop as product recommendations. In condition 5, 5 similar products are shown and in condition 6 there are 2 similar products shown. All photos that respondents could have seen of all six conditions can be found in appendix B.

4. Results

This chapter discusses the results of the online experiment. The experiment consists of a survey with a randomizer so that each respondent is presented with a different situation. The respondents were shown a picture which differed in complexity of the recommended products and whether they were similar or complementary products. The data will be inspected for irregularity, first looking for missing values and outliers. Then the data characteristics will be analyzed and discussed. Next, several statistical tests will be performed that will reject or accept the hypotheses of this thesis. First of all, all the variables in the data will be described. After that, a factor analysis is performed to structure all the data where Cronbach's alpha will be discussed to ensure reliability. Followed by an ANOVA-analysis. After this, moderation and mediation results will be explained and finally, the regression model of this survey is examined. The author used an alpha of 0.05 for this research. For this chapter, the data analysis, all tables, and figures can be found in appendix C.

4.1 Data description

The questionnaire was live for about 2 weeks and was distributed to the author's personal network. The distribution of the questionnaire went through different social media channels, as mentioned in Chapter 3. In the end, a total of 308 respondents participated in the survey. Not all respondents completed the questionnaire completely or answered the check question correctly. These respondents are not shown in the results and are filtered out. This eventually resulted in 249 usable respondents. This provides an $N=249$ for this study.

4.1.1 Total respondents

The goal was to get 40 respondents for each condition. The automatic randomizer in Qualtrics ensured that everyone who opened the survey link received a different condition. These conditions were distributed evenly among all respondents, but since not all responses were usable because, for example, respondents had not completed the questionnaire, the distribution of usable responses was no longer entirely evenly distributed among the conditions. For example, condition 1 has an N of 50 and condition 3 has an N of 37. Condition 3 has the lowest N and condition 1 the highest N . An N of 40 was the goal and this was achieved for some conditions but not for all. Still, the answers are usable because they are all very close to $N=40$.

See table 1.1 in appendix C. The total number of respondents is 308 and the total number of usable respondents is 249.

4.1.2 Gender

Furthermore, the data is divided in 39.8% (N=99) male and 59.4% (N=148) female. 1 of the respondents chose 'other' as gender and 1 of the respondents chose the option 'prefer not to say', see table 1.2 in appendix C.

4.1.3 Age

Looking at age in table 1.3, most respondents are between 20 and 25 years old. As many as 57% (N=142) of the respondents are between 16 and 25 years old. 16% (N=40) is in the age group of 26 and 35 years old, the group of 36 to 45 years old is 10.8% (N=27) of the total group, 10.4% (N=26) of the total sample is between 46 and 55 years old and 5.6% (N=14) is older than 56. See table 1.4 in appendix C.

4.1.4 Income

Looking at the income of the respondents in table 1.5, most of the respondents, 52.2% (N=130) earn less than 2,000 euros gross per month. This may very well be related to the age of the respondents since there are many young respondents who do not have a full-time job yet. Furthermore, 30.5% (N=76) earn between 2,000 and 5,000 gross per month and 10% (N=25) earn more than 5,000 gross per month. 7.2% of the respondents (N=18) prefer not to say what their income is.

4.1.5 Level of education

Regarding the education level of the respondents, it can be seen in table 1.6 that 2.4% (N=6) of the respondents did some high school. 8.4% (N=21) of the respondents are high school graduates. 11.6% (N=29) have had some college, but no degree. 4% (N=10) have an associate degree, 50.2% (N=125) have a bachelors' degree, and 22.5% (N=56) have a masters or doctorate degree. 0.8% (N=2) would rather not say what their level of education is. Thus, the vast majority of respondents have a bachelors' degree, and many people have a masters' or doctorate degree. This could most likely be because the author's circle of acquaintances has a certain level of education, think of friends and acquaintances from university.

4.1.6 Students

In this sample, 53% (N=132) are students at the time of filling in the survey. The rest, 47% (N=117) were not students at that time. See table 1.7 in appendix C.

4.1.7 Nationality

Looking at the nationality of the respondents, it can be seen that the vast majority, 85.1% (N=212) have a Dutch nationality. 11.6% of the respondents (N=29) have a nationality of another country in Europe and 3.2% (N=8) have a nationality of another country outside Europe. If we then look at where the respondents currently live, no less than 94.8% (N=236) live in the Netherlands. 4.8% (N=12) live in another country in Europe and 0.4% (N=1) live in a country outside of Europe. See appendix C, table 1.8.

4.1.8 Country of residence

Looking at appendix c, table 1.9, it can be seen that most respondents live in the Netherlands currently, 94.8% (N=236). Only 4.8% of the respondents (N=12) live in another country in Europe and only 0.4% (N=1) of the respondents live in another country outside of Europe.

4.1.9 Experience with online shopping

Respondents were also asked to what extent they had experience with online shopping. On a scale of 1 to 7, respondents could indicate whether they had no or very much experience with online shopping. The average answer was 6.12 as table 1.10 shows. This is very high. No less than 45.8% (N=114) indicated that they had a lot of experience with online shopping and chose a 7 on a scale of 1 to 7. 33.7% (N=84) choose a 6 on the scale of 1 to 7 and thus have slightly less experience with online shopping. 13.3% (N=33) have even slightly less experience with online shopping and choose a 5 on a scale of 1 to 7. Only 7.2% (N=18) give a rating between 2 and 4 on a scale of 1 to 7, and thus have a little to average experience with online shopping. No respondents have no experience with online shopping at all. See appendix C, table 1.11.

4.2 Dependent and independent variables

In this dataset, the most important variables are the dependent and independent variables. It is around these variables that the research revolves.

4.2.1 Dependent variable

The dependent variable is 'Willingness to buy'. After seeing the picture (the condition) the respondents were asked to what extent they were willing to buy the initial product, in this case a laptop. Respondents answered on a scale from 1 to 7. The answers varied widely, and the average answer is 4.08, slightly higher than the middle number on the 7-point scale, a 4. See table 2.1 in appendix C

4.2.2 Independent variables

When talking about the independent variables, this dataset involves two variables. These two variables were the input for the conditions, to which the pictures that the respondents were shown in this experiment were matched. The first variable is complementary or similar products. One half of the conditions were with complementary products and the other half of the conditions were with similar products. Looking at table 2.2 it can be seen that the averages of the complementary and similar products are very close (4.15 and 4.02). The ANOVA in table 2.3 also shows that this effect is not significant ($P=0.548$). For the complementary products, the willingness to buy is somewhat higher than for the comparable products but this effect is not significant.

The second independent variable is complexity. The complexity consists of three values, namely low, medium, and high. One third of the conditions showed 2 (low) alternative products, one third of the conditions showed 5 (medium) alternative products, and one third of the conditions showed 10 (high) alternative products. Looking at table 2.4 it can be seen that the mean of willingness to buy of low complexity conditions is 3.72, the mean of willingness to buy of medium complexity conditions is 4.6 and of high complexity conditions the mean of willingness to buy is 3.94. So, this shows that medium complexity is the highest and thus produces the highest willingness to buy. The ANOVA table 2.5 shows that this effect is also significant. Figure 2.1 again clearly shows the course of the effect. Low and high complexity both lead to lower willingness to buy, while medium complexity is optimal.

Because this effect is non-linear, there had to be worked with two dummy variables. Low is always indicated with 0 and for medium and high complexity a dummy was created in which case medium or high is indicated with 1. It can be seen in table 2.6 that this ANOVA is significant ($P=0.003$) when the two dummies are separately matched against the dependent variable willingness to buy. It can be seen in table 2.7 that the effect of low-medium is

significant but the effect of low-high is not. This can be explained by the fact that high and low complexity are both low and almost at the same level, while medium complexity is much higher in terms of willingness to buy.

Figure 2.2 in appendix C shows that the optimal number at which the willingness to buy will be highest will not be exactly 5, rather it will be around 6 or 7 items for recommendation under the initial product for the highest willingness to buy.

4.3 Factor Analysis

Before analyzing all the data, a factor analysis was performed to filter out confounding variables and to structure the data. By performing a factor analysis, the variables are distributed among different groups based on common variance. This allows the researcher to determine which variables belong together and which differ (Yong & Pearce, 2013). The method that the researcher used for this study is exploratory factor analysis. This allows the researcher to find out the maximum variance of each variable (Tabachnick, Fidell, & Ullman, 2007).

Then, it will be determined how many variables or factors will be retained, for this purpose the eigenvalue is determined. It is common to take an eigenvalue of 1 (Kaiser, 1960), but in this case the researcher chose to take a limit of 0.95 because 2 factors emerged with quite different variances, to be able to filter out a number of variables that might be distorting. Figure 3.1 in appendix C shows a scree plot where it can be seen that the second factor is very close to 1. Based on this, it was decided to take an eigenvalue of 0.95.

Before discussing the analysis, several assumptions will need to be made. First, all variables must be interval or ratio. This is true in this case because they are all 7-point Likert scales and are considered scale variables. Furthermore, it must be assumed that the same units of measurement were used for testing. Since all Likert scales in this case have 7 points, this assumption is also met. Furthermore, enough observations must have been made. A common rule is that there should be a minimum of 10 observations per variable (Comrey & Lee, 2013). In this case, this assumption was widely met with as many as 249 observations.

In the questionnaire, respondents were asked how they felt at the time they completed the survey. They were presented with conflicting emotions where they had to indicate on a scale of

1 to 7 the extent to which they felt this way. If they did not feel either emotion at that moment, they had to choose the middle option, 4. Before counting with this variable, a factor analysis was done on all the conflicting emotions. A total of 11 conflicting emotions were presented to the respondents, a factor analysis was done on these 11 variables, see table 3.1. First, of all variables, the researcher put the positive feeling in front, and the negative feeling in the back, so that they are all measured to the same extent (Yong & Pearce, 2013). In table 3.2 you can see that several variables deviate. Because feelings are expected to have a mediating effect, deviating variables were filtered, and with the remaining variables a variable was made named 'feelings', so that it can be further analyzed, for example for the mediating effect. This is done by adding up all the emotion variables and dividing it by the number of variables included. The variables satisfied to dissatisfied, lucid to confused and safe to unsafe are not included in the variable called 'feelings' because they are different from the rest. It can also be seen in figure 3.2 that these three variables that were not included, are a bit away from the other variables.

4.3.1 Cronbach's Alpha

The Cronbach's alpha will measure the internal consistency of the factors. This shows the extent to which the variables measure the same thing. If the factor is consistent, the answers show a certain pattern. The alpha is a number between 0 and 1 and it is calculated separately for each factor (Tavakol & Dennick, 2011). The usual rule is that an alpha above 0.7 is acceptable and anything above a 0.8 is satisfactory (Bland & Altman, 1997). When looking at the reliability statistics (Cronbach's Alpha) in table 3.4 and 3.5, factor 1 even reaches 0.903 and factor 2 reaches a figure of 0.715. This means for both factors that the internal consistency is strong. Thus, these factors can be split without concern.

4.4 ANOVA-analysis

Now that the variable feelings have been adjusted by taking out the confounding variables and two dummies have been created for medium and high complexity, an ANOVA analysis of the entire model can be performed. The ANOVA in table 4.1 shows that few variables are significant, only the level of trust of the website is significant. The complexity medium dummy variable comes close but unfortunately is not significant in this ANOVA model.

4.5 Regression analysis

Before performing a linear regression, several assumptions are made. First, it is tested whether a linear function exists between the independent and dependent variables. In this model, all

independent variables are dummy variables, so to speak, because they consist of numbers 0 and 1. This makes the function linear because a dummy variable is linear by definition (Hardy, 1993). Furthermore, the independent and dependent variables will be quantitative variables. The dependent variable is quantitative since it is measured based on a 7-point Likert scale. This is seen as interval. Another assumption is that the dependent variable must be continuous, in this case the dependent variable is continuous because of the 7-point Likert scale. The independent variables may be either continuous or categorical, the dummy variables satisfy this, where 0 = subtle and 1 = prominent.

To begin with, we checked if the linear relationship between the independent and dependent variables satisfies the multicollinearity. For this, the VIF value in table 4.3 is looked at, as can be seen there, the VIF values are all between 1 and 2, The assumption is with because the VIF values of the independent on the dependent variables are all below 5, this means that there is no clear correlation between the variables.

Furthermore, it was also checked whether the dependent variable is normally distributed (Edwards & Lambert, 2007). Figure 5.1 shows the histogram with a normal distribution line of the willingness to buy and there the distribution is quite normally distributed. It can also be seen in figure 5.2 that the dots of the P-P Plot are quite close to the line. This also shows that the dependent variable is normally distributed, because the closer to the line, the better normally distributed. So, this assumption is also met.

4.5.1 Regression formula

The formula appropriate to this regression analysis is as follows:

$$\begin{aligned} \text{Willingness to buy} = & \beta_0 + \beta_1\text{Complementary} + \beta_2\text{ComplexityMedium} + \beta_3\text{ComplexityHigh} \\ & + \beta_4\text{LevelOfTrust} + (\beta_5\text{LevelOfTrust*ComplexityMedium} + \\ & \beta_6\text{LevelOfTrust*ComplexityHigh}) + (\beta_7\text{LevelOfTrust*Complementary}) + \beta_8\text{Age} + \\ & (\beta_9\text{Age*ComplexityMedium} + \beta_{10}\text{Age*ComplexityHigh}) + (\beta_{11}\text{Age*Complementary}) + \\ & \beta_{12}\text{Student} + (\beta_{13}\text{Student*ComplexityMedium} + \beta_{14}\text{Student*ComplexityHigh}) + \\ & (\beta_{15}\text{Student*Complementary}) + \beta_{16}\text{ExperienceWithOnlineShopping} + \\ & (\beta_{17}\text{ExperienceWithOnlineShopping*ComplexityMedium} + \\ & \beta_{18}\text{ExperienceWithOnlineShopping*ComplexityHigh}) + \end{aligned}$$

$$(\beta_{19}\text{ExperienceWithOnlineShopping}*\text{Complementary})+ \beta_{20}\text{FeelingsDuringExperiment} + \beta_{21}\text{Gender} + \beta_{22}\text{Nationality} + \beta_{23}\text{CountryOfResidence} + \beta_{24}\text{Income} + \beta_{25}\text{Education} + \varepsilon$$

When looking at the beta values in table 5.3 in the appendix C, the formula can be filled in with the appropriate values.

4.5.2 Description of important beta values

These beta values are shown in table 5.3 and imply that there is a constant willingness to buy of 2.739, when all other values are 0. If a person is presented with complementary products on a product page the willingness to buy will decrease by 0.177, based on this it would be better to show similar products, but this effect is not significant. If a person is presented with a medium complexity of alternatives on a product page, the willingness to buy increases by 0.460, this effect is quite close to being significant. If a person is presented with a high complexity of alternatives on a product page, the willingness to buy increases by 0.186, only this effect is not significant. If a person trusts a website with 1 point more on a scale of 1 to 7, the willingness to buy increases by 0.585, this direct effect is significant. So, trust influences the willingness to buy. If a person is one year older, the willingness to buy will decrease by 0.005, this would show that young people have a higher willingness to buy than older people, but this effect is not significant. If someone is a student, the willingness to buy decreases by 0.144, while if someone is not a student there is no decrease, this is not what was initially expected but this effect is also not significant. If someone has more experience with online shopping (one point higher on a scale of 1 to 7) the willingness to buy decreases by 0.023, more experienced shoppers are thus less willing to buy a laptop. This effect is just not significant. If someone feels more negative at the time of shopping, one point higher on a scale of 1 to 7, the willingness to buy will decrease by 0.109, this is to be expected that when someone feels positive, the willingness to buy is higher. but this effect is also not significant. Also, some error factors are considered.

Table 5.1 in appendix C shows that 60,3% of the willingness to buy is determined by these factors. Though, only the effect of level of trust is significant.

4.6 Moderation analysis

Some moderation effects are expected. All continuous variables are centered, to avoid multicollinearity and to allow for easier interpretation (Kromrey & Foster-Johnson, 1998). A moderation effect is measured when the (centered) variable is significant AND these same centered variables times the independent variable is significant, compared to the dependent variable through a regression analysis (Sharma, Durand, & Gur-Arie, 1981).

First, a moderation analysis is done of the independent variable: complementary, this variable indicates whether complementary or similar products were used in the conditions.

4.6.1 Complementary or similar products moderation analysis

Looking at the results of the moderation analysis in table 6.3 in Appendix C, only the variable trust is significant ($P=0.000$), but the variable complementary times trust is again not significant ($P=0.689$). So, this shows that there is no moderation effect at all between complementary or similar products and willingness to buy. There is even no effect between complementary or similar products and willingness to buy, so there cannot be a moderation effect either.

4.6.2 Complexity medium moderation analysis

If we look at the results in table 6.6 in appendix C of the moderation analysis between complexity medium dummy and willingness to buy, it can be seen that the main effect is present between them, namely it is significant ($P=0.038$). Also, the effect of trust on willingness to buy is significant ($P=0.000$), but unfortunately the moderation effect complexity medium times trust is not significant so there is no moderation for level of trust of the website.

4.6.3 Complexity high moderation analysis

Looking at table 6.9, the moderation analysis can be seen. In this case of the dummy of complexity high on willingness to buy and some expected moderation effects, in the table the main effect of complexity high on willingness to buy is already not significant, only the separate effect of trust on willingness to buy is significant. This means that no moderation effect is present in this model. Only a direct effect of website trust on willingness to buy.

4.7 Mediation analysis

A mediation effect of feelings on both complexity and complementarity is expected. There is a mediation effect when the indirect effect is significant (Preacher & Hayes, 2004). Three mediation analyses are performed using SPSS and PROCESS. An effect is significant if the 95% confidence interval does not include zero.

4.7.1 Mediation analysis complexity

Table 7.1 in appendix C shows the PROCESS mediation analysis for the independent variable complexity, with two dummies. The first dummy: complexity medium was set as independent variable, and the second dummy: complexity high was set as covariate. As shown in table 7.1 in the appendix the LLCI is -0.0281, the ULCI is 0.0131 and the P-value is 0.4742 of the indirect effect. The interval contains 0, which means there is no significant mediating effect between the independent variable complexity and the dependent variable willingness to buy. The direct effect of complexity medium is, as we saw earlier, significant.

In table 7.2 in appendix C the PROCESS mediation analysis is shown for the independent variable complexity, with two dummies. Now, the second dummy: complexity high was set as independent variable and the dummy complexity medium was set as covariate. the A mediating effect of feelings was expected. As can be seen in table 7.2 the LLCI is again -0.0281, the ULCI is 0.0131 and the P-value is 0.4742 of the indirect effect. The interval again contains 0, which means there is no significant mediating effect of feelings between complexity and the willingness to buy.

4.7.2 Mediation analysis complementary

Lastly, in table 7.3 the PROCESS mediation analysis is shown for the independent variable complementary. A mediating effect of feelings was expected. As table 7.3 shows, the LLCI is -0.3670, the ULCI is 0.0589 and the P-value is 0.1555 of the indirect effect. The interval contains 0, which means there is no significant mediating effect between the independent variable complementary and the dependent variable willingness to buy.

5. General discussion

This chapter will provide a conclusion of the study. It will be evaluated whether the hypotheses that were set up beforehand should be rejected or accepted. This will also ultimately answer the research question. Thereafter, the academic and managerial implications will be described as well as the limitations and further research.

5.1 Outcome of the hypotheses

Table 2 below shows which hypotheses are supported and which are not.

Table 2: Outcome of the hypotheses

H1	Showing similar alternatives has a significantly negative effect on the willingness to buy.	Not supported
H2	The number of alternatives shown has a significant effect on the willingness to buy.	Supported
H3a	The number of alternatives shown has a significant effect on the willingness to buy and is moderated by the level of trust of the website.	Not supported
H3b	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is moderated by the level of trust of the website.	Not supported
H4a	The number of alternatives shown has a significant effect on the willingness to buy and is moderated by the fact that someone is a student.	Not supported
H4b	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is moderated by the fact that someone is a student.	Not supported
H5a	The number of alternatives shown has a significant effect on the willingness to buy and is moderated by age.	Not supported
H5b	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is moderated by age.	Not supported

H6a	The number of alternatives shown has a significant effect on the willingness to buy and is moderated by the experience with online shopping.	Not supported
H6b	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is moderated by the experience with online shopping	Not supported
H7a	The number of alternatives shown has a significant effect on the willingness to buy and is mediated by feelings.	Not supported
H8a	The kind of alternatives shown (similar or complementary) has a significant effect on the willingness to buy and is mediated by feelings.	Not supported

The data showed that showing similar or complementary alternatives did not have a significant effect on the willingness to buy. This was expected by the researcher since there have been a number of studies on choice stress (Kahneman & Tversky, Choices, values, and frames, 1984); (Loewenstein & Thaler , 1989), which show that people would rather choose an easy and clear option than have to choose between two things that are similar (Shafir & Tversky, 1995). This would imply that choosing between similar products creates choice stress and has a detrimental effect on willingness to buy. However, this effect is thus not reflected in the results of this study.

The number of products shown does have a significant effect on willingness to buy. This was expected by the researcher in advance and thus confirmed with this study. It appears that showing two alternatives is too few, but ten is again too many. The optimal number is expected to be around six to seven alternatives. The results of this research therefore confirm the studies that say that too much choice creates choice stress (Payne, Bettman, & Johnson, 1993); (Iyengar & Kamenica, 2006). And this study also confirms that there is a correlation that will first increase and then decrease after a certain optimal point of alternatives (Shah & Wolford, 2007).

Furthermore, a moderation effect was expected from some variables. Studies have been done on the effect of website trust on willingness to purchase, the fact that someone is a student would mean a higher purchase rate according to some studies. Also, the data shows that no significant moderation effect can be seen, for any of the tested and expected variables. However, the researcher did find that there is a very strong direct effect between a person's level

of trust and willingness to buy. Past studies have shown that trust plays a central role in purchase behavior (Cho, 2006); (Kim & Lee, 2008) and this study has confirmed that effect.

Also, no significant mediation effect of the feelings the respondent had at the time of shopping was found. Beforehand, this was expected by the researcher. Indeed, there have been several studies showing that emotions trigger cognitive processes that have an effect to decision-making (Lerner & Keltner, 2001); (Lerner & Tiedens, 2006).

5.2 Academic and managerial implications

Academic implications

As described earlier, much research has been done on the effect of choice complexity on willingness to buy (Iyengar & Kamenica, 2006); (DeShazo & Fermo, 2002) and decision-making in online environments (Häubl & Trifts, 2000). Yet how specifically this choice complexity affects the e-commerce electronics industry has not been adequately explored. Furthermore, this study is unique in finding out different moderation and mediation effects for this industry. For example, whether being a student increases the willingness to buy for the online electronics market, or to what extent feelings influence the willingness to buy for this industry.

The results show that the number of alternatives presented to a person is important for the willingness to buy the initial product. How a person feels at the time has no significant mediating effect on willingness to buy. Furthermore, no moderations were found, so no matter what the age is, whether a person is a student and whether a person has much experience with online shopping have no influence on the willingness to buy. However, it does appear that trust in the website plays a significant role in a person's willingness to purchase the product.

Managerial implications

This study is useful for managers in companies operating in the e-commerce electronics industry. E-commerce is still growing rapidly, and this is already a large industry of US\$2,723,991m and is expected to grow by 6.29% annually (E-commerce worldwide, 2021). Due to the expected growth, it is important for managers to show the best product pages to their website visitors to increase the number of purchases through their website and thus their market share in the industry.

In this study, the researcher showed the respondents several product pages with varying alternatives. Interesting findings came out of this that managers in the e-commerce electronics industry can use.

This research showed that trust in the website plays an important role in the customer's willingness to buy. A manager can base his strategy on this, to make the website as reliable as possible. A manager can achieve trust by giving clear information, delivery guarantees, and easy navigation on company websites. The website itself and the reputation of the company is also an important for a higher level of trust.

It has also been shown that for electronics the best results are achieved on a product page when 6 to 7 alternatives are displayed. Furthermore, it does not matter whether the products are similar or complementary.

In this research a laptop was used to represent electronics. So, for managers working with completely different products the results could be different. In the next section, there will be further discussion on how best to build on this research in the future so that these insights can be used for companies.

5.3 Limitations and further research

There are a number of limitations to consider for this study. First of all, the survey was sent out in English. Because there were many people from the Netherlands who filled out the questionnaire and many, but probably not all, of them have a good command of English, it is possible that a language barrier arose whereby the questions were not properly understood. This effect is most likely minimal.

Furthermore, on the same page in the questionnaire, people were asked to what extent they would be willing to buy the laptop, and then immediately to what extent they would trust the website. It could be that people answered both questions the same and therefore a bias was created. Since both questions had to be answered with a 7-point Likert scale, it could be that people tended to place their answer roughly in the same place. This could mean that website trust has less of an effect than was found in this study.

Also, the distribution in age of the sample is not realistic for the entire population. This is also the case for education level, gender, income, and the number of students in this sample. This must be taken into consideration when looking at the results of this study and using them in other contexts.

Also, this study showed a product page of a laptop while making statements about electronics. When evaluating the outcomes of this research, care must be taken that these outcomes may not be the same for every type of electronics. Future researchers could do this research for other product groups, such as cellphones or other electronics.

Furthermore, the sample size was another important limitation for this study. A bigger sample size could cause significant results.

Finally, in this study respondents were shown a product page. They only saw a laptop and below that some recommended products and a button they: add to cart. Other than that, nothing was seen of the website itself, and no logo was used. It may be so that if a brand will apply this study, the outcomes will be different. For example, because of the website interface, the logo, and the colors. These elements may, in fact, bring with them other associations. In this study these associations would not be desirable and could influence the pure effect, but in the real e-commerce environment these elements are of course applicable. Therefore, companies that want to use this research for their own website are advised to do their own testing and compare the results. Future researchers could measure the effect of these types of elements (e.g., website interface, logo, and colors).

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Appendix A: Questionnaire design

Subject	Variable	Measurement	Scale	Items	Question
Randomized experiment picture	6 different variables: Similar /complementary and complexity: high/ medium/ low (e.g., similar products with low complexity, similar products with high complexity, complementary products with low complexity etc.)			1	Imagine you need a laptop for your studies or work. You have no preference in brand or price. You are looking online for the range of laptops available, and you land on the following product page of a laptop:
Willingness to buy	Willingness to buy	Not willing to buy a laptop at all - Very much willing to buy a laptop	Likert scale (semantic differential scale)	7	To what extent are you willing to buy a laptop?
Trust of the website	Trustworthiness	I do not trust this website – I trust this website very much	Likert scale (semantic differential scale)	7	To what extent do you trust this (hypothetical) website?

Check question				7	Please place the cursor in the middle.
Feelings and emotions while filling in the survey	Emotions	Energetic- Lethargic Hopeful- Unfortunate Sad-Happy Optimistic- Pessimistic Peaceful-Angry Confused-Lucid Satisfied- Dissatisfied Good humored- Irritated Fascinated- Uninterested Amused-Bored Unsafe-Safe	Likert scale (semantic differential scale)	7	You will be presented some conflicting emotions. Please place the cursor on the spot that applies most for you at the moment. If you do not feel any of the two emotions presented, please place your cursor in the middle.
Demographic variables	Age		Scale		What is your age? Please fill in...
	Gender	Male, Female, Other, Prefer not to say	Nominal	4	What is your gender?
	Income	Less than 2,000, Between 2,000 and 5,000, More than 5,000, Prefer not to say	Ordinal	4	What is your gross monthly income?

	Highest level of education	Some high school, High school graduate, Some college, no degree, Associate degree, Bachelors' degree, Graduate degree (Masters, Doctorate), Prefer not to say	Ordinal	7	What is your highest level of education?
	Student	Yes, No	Nominal	2	Are you a student currently?
	Nationality	Dutch, Other country in Europe, Other country outside of Europe, Prefer not to say	Nominal	4	What is your nationality?
	Living country	Netherlands, Other country in Europe, Other country outside of Europe, Prefer not to say	Nominal	4	Where are you living now?
Online shopping experience	Experience	No experience at all – Very much experience	Likert scale (semantic differential scale)	7	To what extent do you have experience with online shopping?

Appendix B: Conditions

Image 1: condition 1



Image 2: condition 2



Image 3: condition 3



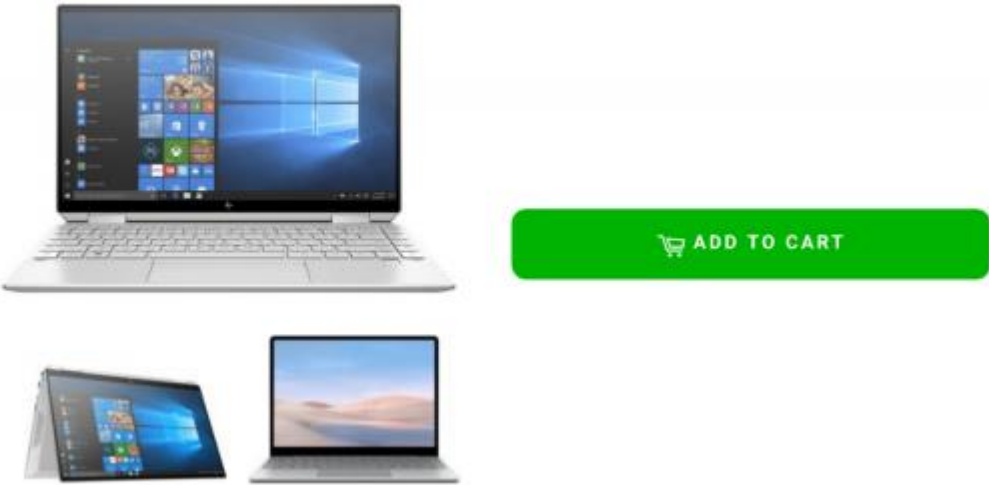
Image 4: condition 4



Image 5: condition 5



Image 6: condition 6



Appendix C: Results

Data description

Table 1.1: descriptive statistics for all conditions

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Condition 1	50	1	7	3,88	1,780
Condition 2	40	1	7	4,78	1,641
Condition 3	37	1	7	3,38	1,381
Condition 4	38	1	7	4,03	1,684
Condition 5	40	1	7	4,43	1,907
Condition 6	44	1	7	4,00	1,671
Valid N (listwise)	0				

Table 1.2: frquencies for gender

		Gender			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Male	99	39,8	39,8	39,8
	Female	148	59,4	59,4	99,2
	Other	1	,4	,4	99,6
	Prefer not to say	1	,4	,4	100,0
	Total	249	100,0	100,0	

Table 1.3: frequencies for age

		Age			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	16	1	,4	,4	,4
	18	2	,8	,8	1,2
	19	2	,8	,8	2,0
	20	6	2,4	2,4	4,4
	21	25	10,0	10,0	14,5
	22	26	10,4	10,4	24,9
	23	34	13,7	13,7	38,6
	24	25	10,0	10,0	48,6

25	21	8,4	8,4	57,0
26	5	2,0	2,0	59,0
27	8	3,2	3,2	62,2
28	4	1,6	1,6	63,9
29	3	1,2	1,2	65,1
30	1	,4	,4	65,5
31	6	2,4	2,4	67,9
32	5	2,0	2,0	69,9
33	3	1,2	1,2	71,1
34	3	1,2	1,2	72,3
35	2	,8	,8	73,1
36	1	,4	,4	73,5
37	3	1,2	1,2	74,7
38	1	,4	,4	75,1
39	1	,4	,4	75,5
40	2	,8	,8	76,3
41	6	2,4	2,4	78,7
42	3	1,2	1,2	79,9
43	4	1,6	1,6	81,5
44	4	1,6	1,6	83,1
45	2	,8	,8	83,9
46	1	,4	,4	84,3
47	1	,4	,4	84,7
48	2	,8	,8	85,5
49	6	2,4	2,4	88,0
50	3	1,2	1,2	89,2
51	4	1,6	1,6	90,8
52	3	1,2	1,2	92,0
53	2	,8	,8	92,8
54	3	1,2	1,2	94,0
55	1	,4	,4	94,4
56	3	1,2	1,2	95,6
57	3	1,2	1,2	96,8
58	1	,4	,4	97,2
59	1	,4	,4	97,6
60	2	,8	,8	98,4
65	1	,4	,4	98,8
71	1	,4	,4	99,2
78	1	,4	,4	99,6
81	1	,4	,4	100,0

Total	249	100,0	100,0
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Table 1.4: frequencies for age categories

		Age_cat			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	16-25	142	57,0	57,0	57,0
	26-35	40	16,1	16,1	73,1
	36-45	27	10,8	10,8	83,9
	46-55	26	10,4	10,4	94,4
	56+	14	5,6	5,6	100,0
	Total	249	100,0	100,0	

Table 1.5 frequencies for income

		Income			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Less than 2,000	130	52,2	52,2	52,2
	Between 2,000 and 5,000	76	30,5	30,5	82,7
	More than 5,000	25	10,0	10,0	92,8
	Prefer not to say	18	7,2	7,2	100,0
	Total	249	100,0	100,0	

Table 1.6: frequencies for level of education

		Highest level of education			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Some high school	6	2,4	2,4	2,4
	High school graduate	21	8,4	8,4	10,8
	Some college, no degree	29	11,6	11,6	22,5
	Associate degree	10	4,0	4,0	26,5
	Bachelors degree	125	50,2	50,2	76,7
	Graduate degree (Masters, Doctorate)	56	22,5	22,5	99,2
	Prefer not to say	2	,8	,8	100,0
	Total	249	100,0	100,0	

Table 1.7: frequencies for student, yes or no

		Student			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Yes	132	53,0	53,0	53,0
	No	117	47,0	47,0	100,0
	Total	249	100,0	100,0	

Table 1.8: frequencies for nationality

		Nationality			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Dutch	212	85,1	85,1	85,1
	Other country in Europe	29	11,6	11,6	96,8
	Other country outside of Europe	8	3,2	3,2	100,0
	Total	249	100,0	100,0	

Table 1.9: frequencies for living country

		Living country			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	Netherlands	236	94,8	94,8	94,8
	Other country in Europe	12	4,8	4,8	99,6
	Other country outside of Europe	1	,4	,4	100,0
	Total	249	100,0	100,0	

Table 1.10 descriptive statistics for experience with online shopping

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Experience	249	2	7	6,12	1,093
Valid N (listwise)	249				

Table 1.11: frequencies for experience with online shopping

		Experience			Cumulative
		Frequency	Percent	Valid Percent	Percent
Valid	2	3	1,2	1,2	1,2
	3	9	3,6	3,6	4,8
	4	6	2,4	2,4	7,2
	5	33	13,3	13,3	20,5
	6	84	33,7	33,7	54,2
	7	114	45,8	45,8	100,0
	Total	249	100,0	100,0	

Independent and dependent variables

Table 2.1: descriptive statistics for willingness to buy

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Willingness_to_buy	249	1,00	7,00	4,0803	1,72785
Valid N (listwise)	249				

Table 2.2: descriptives for complementary/similar products

Descriptives								
Willingness_to_buy								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Similar	122	4,1475	1,75184	,15860	3,8335	4,4615	1,00	7,00
Complementary	127	4,0157	1,70891	,15164	3,7157	4,3158	1,00	7,00
Total	249	4,0803	1,72785	,10950	3,8647	4,2960	1,00	7,00

Table 2.3: ANOVA-analysis for complementary products on willingness to buy

ANOVA

Willingness_to_buy

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1,081	1	1,081	,361	,548
Within Groups	739,313	247	2,993		
Total	740,394	248			

Table 2.4: descriptives for complexity

Descriptives

Willingness_to_buy

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Low	81	3,7160	1,56712	,17412	3,3695	4,0626	1,00	7,00
Medium	80	4,6000	1,77607	,19857	4,2048	4,9952	1,00	7,00
High	88	3,9432	1,73111	,18454	3,5764	4,3100	1,00	7,00
Total	249	4,0803	1,72785	,10950	3,8647	4,2960	1,00	7,00

Table 2.5: ANOVA-analysis for complexity on willingness to buy

ANOVA

Willingness_to_buy

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	34,009	2	17,004	5,922	,003
Within Groups	706,385	246	2,871		
Total	740,394	248			

Figure 2.1: means plot for complexity on willingness to buy

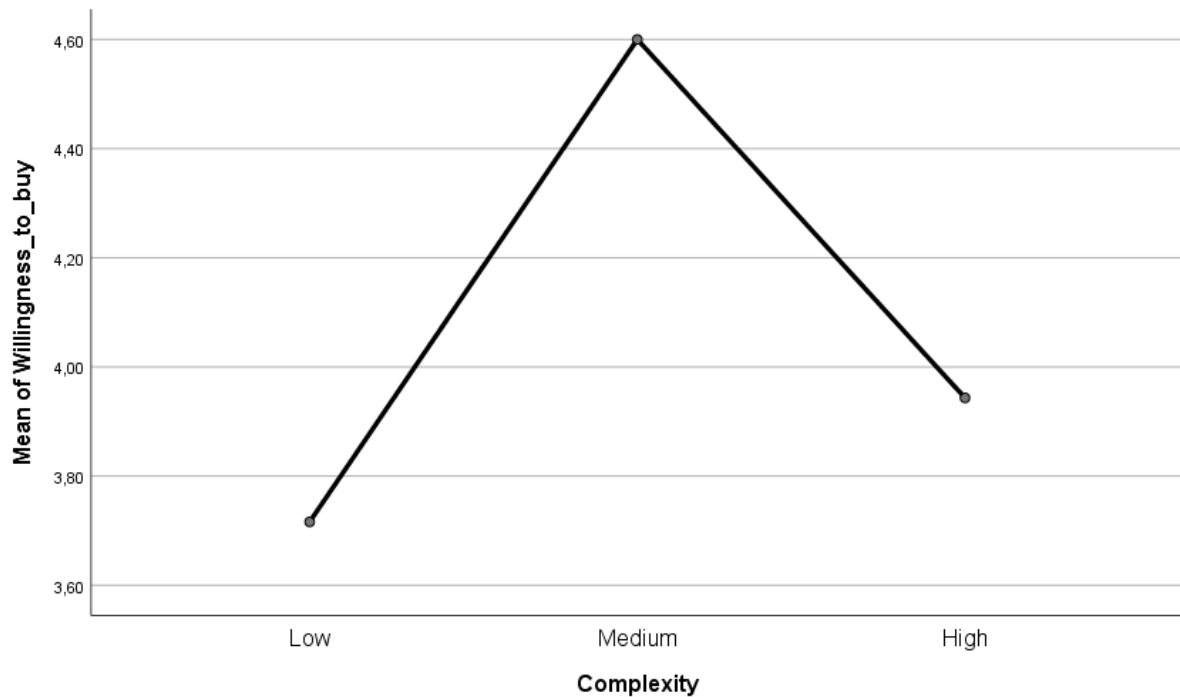


Table 2.6: ANOVA-analysis for two dummies: complexity medium and complexity high

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	34,009	2	17,004	5,922	,003 ^b
	Residual	706,385	246	2,871		
	Total	740,394	248			

a. Dependent Variable: Willingness_to_buy

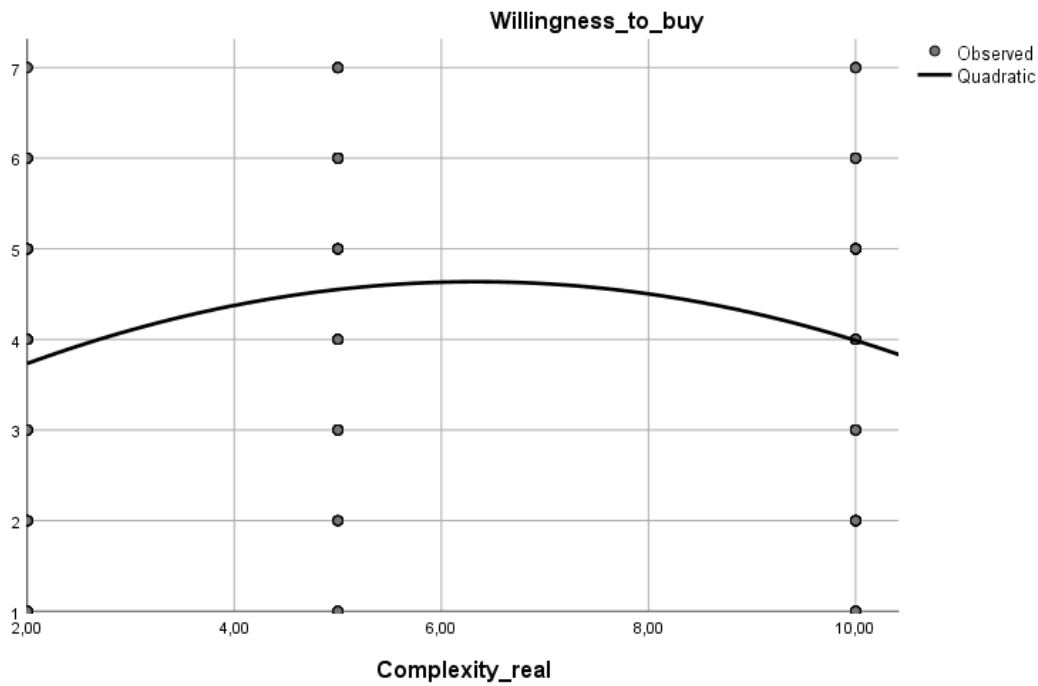
b. Predictors: (Constant), Complexity_High, Complexity_Medium

Table 2.7: coefficients for two dummies: complexity medium and complexity high

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,716	,188		19,737	,000
	Complexity_Medium	,884	,267	,239	3,309	,001
	Complexity_High	,227	,261	,063	,870	,385

a. Dependent Variable: Willingness_to_buy

Figure 2.2: optimal complexity for highest willingness to buy



Factor analysis

Table 3.1: Factor analysis of all feelings with eigenvalue 0,95

Component	Total Variance Explained								
	Initial Eigenvalues			Extraction Sums of Squared			Rotation Sums of Squared		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,832	53,020	53,020	5,832	53,020	53,020	4,515	41,048	41,048
2	,995	9,050	62,070	,995	9,050	62,070	2,312	21,022	62,070
3	,854	7,762	69,831						
4	,615	5,594	75,425						
5	,582	5,293	80,718						
6	,500	4,547	85,265						
7	,410	3,726	88,992						
8	,344	3,127	92,119						
9	,323	2,936	95,055						

10	,314	2,853	97,908						
11	,230	2,092	100,000						

Extraction Method: Principal Component Analysis.

Table 3.1: Rotated component matrix for all feelings

Rotated Component Matrix^a

	Component	
	1	2
Energetic_Lethargic	,765	,045
Hopeful_unfortunate	,784	,268
Optimistic_pessimistic	,710	,297
Peaceful_angry	,612	,417
Satisfied_dissatisfied	,528	,628
Goodhumoured_irritated	,764	,333
Fascinated_uninterested	,691	,210
Amused_bored	,716	,202
Happy_Sad	,715	,423
Lucid_confused	,250	,709
Safe_Unsafe	,104	,840

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Table 3.3: component transformation matrix for the two factors

Component Transformation Matrix

Component	1	2
1	,853	,522
2	-,522	,853

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Figure 3.1: scree plot for all feeling variables

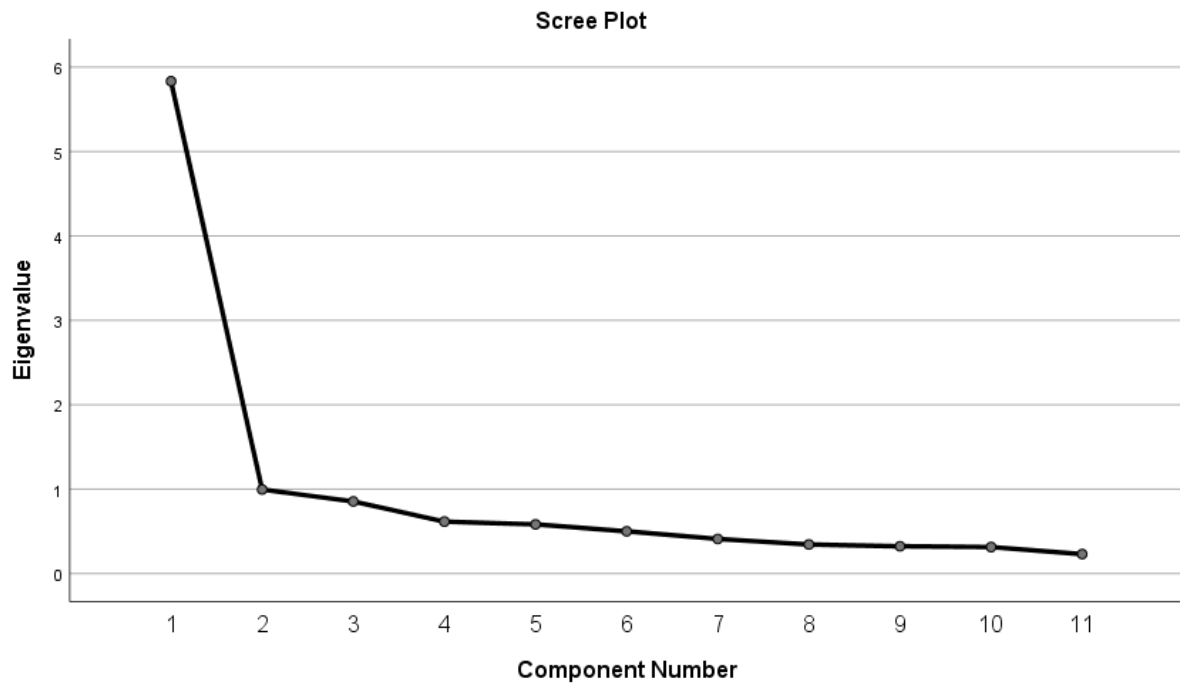


Figure 3.2: component plot for all feeling variables

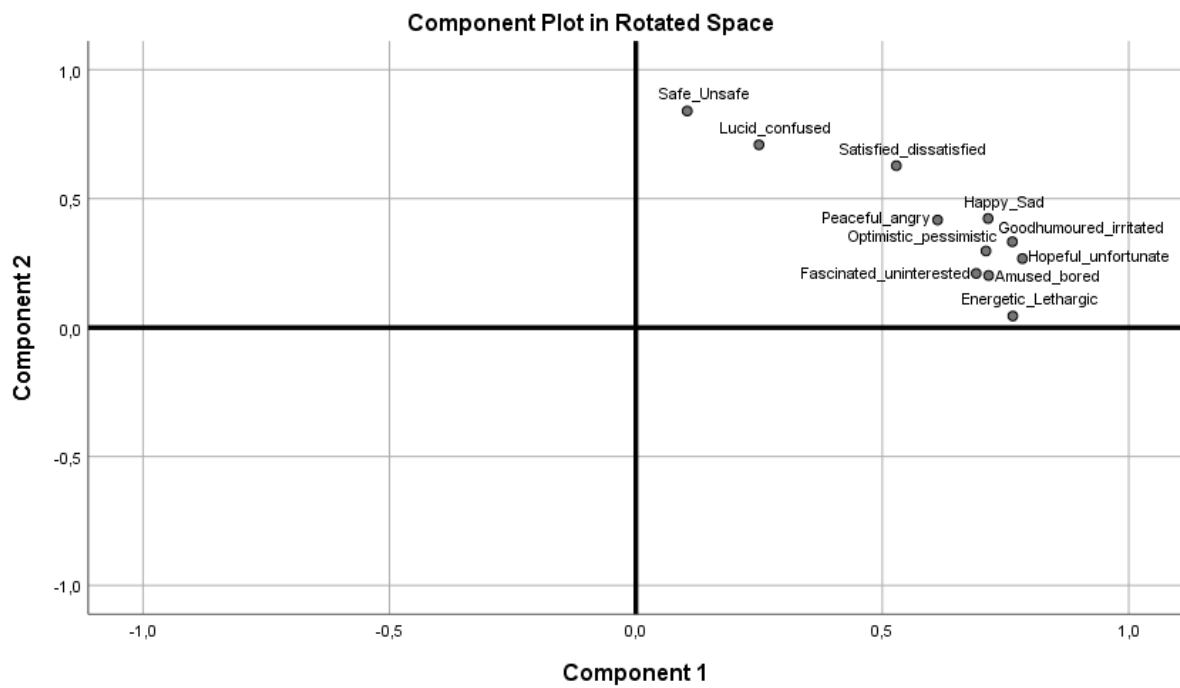


Table 3.4: Cronbach's alpha factor 2

Reliability Statistics	
Cronbach's Alpha	N of Items
,715	3

Table 3.5: Cronbach's alpha factor 1

Reliability Statistics	
Cronbach's Alpha	N of Items
,903	8

ANOVA analysis

Table 4.1 ANOVA-analysis of entire model

Tests of Between-Subjects Effects						
Dependent Variable: Willingness_to_buy						
Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	Hypothesis	66,802	1	66,802	36,004	,000
	Error	293,603	158,242	1,855 ^a		
Level_of_trust	Hypothesis	101,404	6	16,901	8,753	,000
	Error	301,204	156	1,931 ^b		
Age	Hypothesis	70,786	46	1,539	,797	,813
	Error	301,204	156	1,931 ^b		
Experience	Hypothesis	3,855	5	,771	,399	,849
	Error	301,204	156	1,931 ^b		
Complementary	Hypothesis	,306	1	,306	,159	,691
	Error	301,204	156	1,931 ^b		
Complexity_Medium	Hypothesis	5,154	1	5,154	2,669	,104
	Error	301,204	156	1,931 ^b		
Complexity_High	Hypothesis	,033	1	,033	,017	,896

	Error	301,204	156	1,931 ^b		
Feelings_1	Hypothesis	81,861	35	2,339	1,211	,214
	Error	301,204	156	1,931 ^b		
Student	Hypothesis	,196	1	,196	,101	,751
	Error	301,204	156	1,931 ^b		
Gender	Hypothesis	1,093	3	,364	,189	,904
	Error	301,204	156	1,931 ^b		

a. ,048 MS(Gender) + ,952 MS(Error)

b. MS(Error)

Regression analysis

Table 5.1: model summary regression analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,603 ^a	,364	,293	1,45302

a. Predictors: (Constant), Complexity_highAge, Income, Complementary, Complexity_Medium, ComplementaryStudent, Living country, Gender, Highest level of education, Level of trust, Feelings_1, Complexity_highTrust, ComplementaryExperience, Complexity_medExperience, ComplementaryTrust, Experience, Complexity_medStudent, Complexity_High, Nationality, Complexity_medTrust, Age, Complexity_highExperience, ComplementaryAge, Complexity_highStudent, Student, Complexity_medAge

Table 5.2: ANOVA outcome regression analysis

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	269,582	25	10,783	5,108	,000 ^b
	Residual	470,811	223	2,111		
	Total	740,394	248			

a. Dependent Variable: Willingness_to_buy

b. Predictors: (Constant), Complexity_highAge, Income, Complementary, Complexity_Medium, ComplementaryStudent, Living country, Gender, Highest level of education, Level of trust, Feelings_1, Complexity_highTrust, ComplementaryExperience, Complexity_medExperience, ComplementaryTrust, Experience, Complexity_medStudent, Complexity_High, Nationality, Complexity_medTrust, Age, Complexity_highExperience, ComplementaryAge, Complexity_highStudent, Student, Complexity_medAge

Table 5.3: Coefficients table regression analysis

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	2,739	1,022		2,679	,008
	Level of trust	,585	,067	,501	8,670	,000
	Age	-,005	,011	-,036	-,459	,647
	Gender	,051	,189	,015	,268	,789
	Income	-,174	,138	-,092	-1,265	,207
	Highest level of education	,005	,076	,004	,072	,943
	Student	-,144	,273	-,042	-,529	,597
	Nationality	-,135	,242	-,036	-,559	,577
	Living country	,093	,444	,013	,209	,834
	Experience	-,023	,094	-,015	-,246	,806
	Complementary	-,177	,194	-,051	-,910	,364
	Complexity_Medium	,460	,244	,125	1,888	,060
	Complexity_High	,186	,231	,052	,805	,421
	Feelings_1	-,109	,099	-,064	-1,102	,272
	ComplementaryTrust	,016	,138	,007	,119	,905
	ComplementaryExperience	,048	,191	,015	,250	,803
	ComplementaryStudent	-,273	,526	-,040	-,520	,604
	ComplementaryAge	,002	,021	,008	,104	,917
	Complexity_medExperience	-,179	,238	-,054	-,755	,451
	Complexity_medTrust	,011	,167	,004	,063	,950
	Complexity_medStudent	,150	,651	,020	,231	,818
	Complexity_medAge	-,025	,026	-,086	-,971	,333
	Complexity_highExperience	,010	,232	,003	,041	,967
	Complexity_highTrust	-,199	,161	-,080	-1,231	,220
	Complexity_highStudent	-,176	,573	-,024	-,308	,759
	Complexity_highAge	-,024	,024	-,083	-1,003	,317

a. Dependent Variable: Willingness_to_buy

Table 5.4 residuals statistics regression analysis

Residuals Statistics ^a					
	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1,6364	6,5686	4,0803	1,00290	249
Residual	-5,56862	4,12264	,00000	1,40700	249
Std. Predicted Value	-2,437	2,481	,000	1,000	249
Std. Residual	-3,893	2,882	,000	,984	249

a. Dependent Variable: Willingness_to_buy

Figure 5.1: Histogram normal distribution willingness to buy

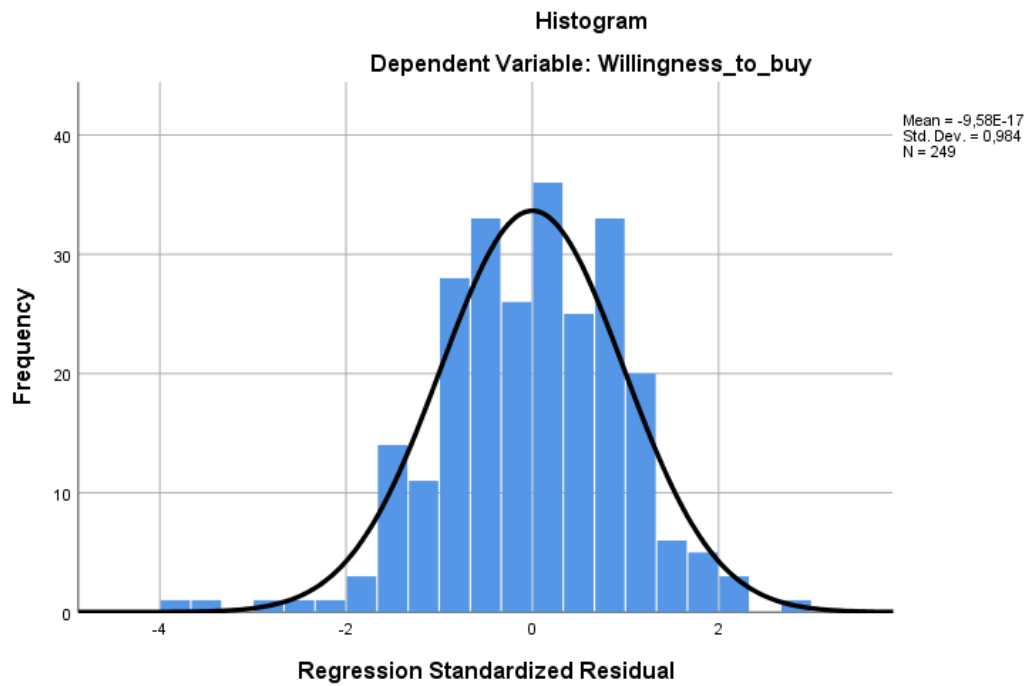
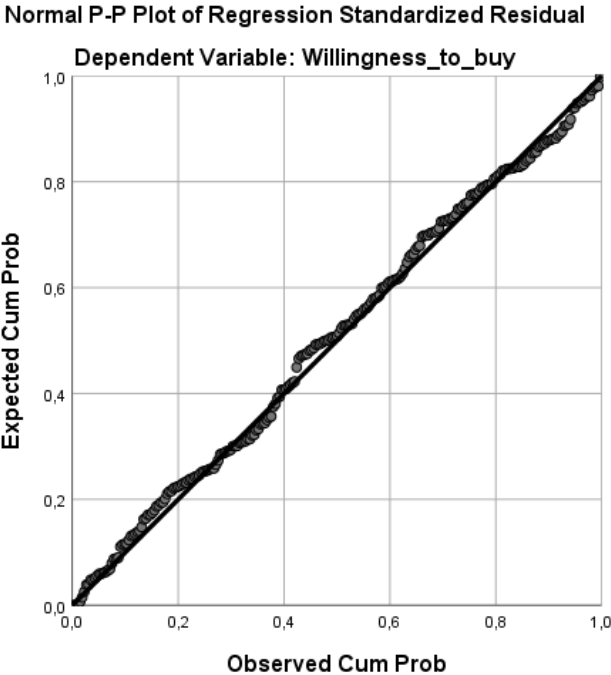


Figure 5.2: normal P-P- Plot regression willingness to buy



Moderation analysis

Table 6.1 Model summary complementary moderation

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,567 ^a	,322	,296	1,44945

a. Predictors: (Constant), ComplementaryAge, Complementary_centr, Age_centr, ComplementaryTrust, Experience_centr, ComplementaryExperience, Trust_centr, ComplementaryStudent, Student_centr

b. Dependent Variable: Willingness_to_buy

Table 6.2 ANOVA complementary moderation

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	238,274	9	26,475	12,602	,000 ^b
	Residual	502,119	239	2,101		
	Total	740,394	248			

a. Dependent Variable: Willingness_to_buy

b. Predictors: (Constant), ComplementaryAge, Complementary_centr, Age_centr, ComplementaryTrust, Experience_centr, ComplementaryExperience, Trust_centr, ComplementaryStudent, Student_centr

Table 6.3 Coefficients complementary moderation

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,275	,535		7,996	,000
	Complementary	,725	,735	,210	,986	,325
	Trust_centr	,650	,101	,557	6,459	,000
	Experience_centr	,014	,133	,009	,108	,914
	Student	-,095	,349	-,027	-,271	,787
	Age_centr	-,009	,014	-,067	-,678	,498
	ComplementaryTrust	-,052	,130	-,035	-,400	,689

ComplementaryExperience	-,039	,177	-,018	-,219	,827
ComplementaryStudent	-,578	,485	-,270	-1,191	,235
ComplementaryAge	,009	,020	,048	,483	,630

a. Dependent Variable: Willingness_to_buy

Table 6.4: Model summary complexity medium moderation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,578 ^a	,334	,309	1,43603

a. Predictors: (Constant), Complexity_medAge, Complexity_medium_centr, Age_centr, Complexity_medExperience, Experience_centr, Trust_centr, Complexity_medTrust, Student_centr, Complexity_medStudent

Table 6.5 ANOVA complexity medium moderation

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	247,534	9	27,504	13,337	,000 ^b
	Residual	492,859	239	2,062		
	Total	740,394	248			

a. Dependent Variable: Willingness_to_buy

b. Predictors: (Constant), Complexity_medAge, Complexity_medium_centr, Age_centr, Complexity_medExperience, Experience_centr, Trust_centr, Complexity_medTrust, Student_centr, Complexity_medStudent

Table 6.6: Coefficients complexity medium moderation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4,080	,093		43,953	,000
	Complexity_medium	,419	,201	,114	2,084	,038
	Trust_centr	,590	,064	,505	9,209	,000
	Experience_centr	,007	,086	,005	,087	,931
	Student	-,302	,241	-,087	-1,256	,210

Age_cent	-,006	,010	-,042	-,598	,551
Complexity_medExperience	-,162	,180	-,049	-,898	,370
Complexity_medTrust	,095	,140	,038	,680	,497
Complexity_medStudent	,502	,551	,067	,911	,363
Complexity_medAge	-,024	,022	-,083	-1,097	,274

a. Dependent Variable: Willingness_to_buy

Table 6.7: Model summary complexity high moderation

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,574 ^a	,330	,305	1,44096

a. Predictors: (Constant), Complexity_highAge, Age_cent, Complexity_high_cent, Complexity_highTrust, Trust_cent, Experience_cent, Complexity_highExperience, Student_cent, Complexity_highStudent

Table 6.8: ANOVA complexity high moderation

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	244,140	9	27,127	13,064	,000 ^b
	Residual	496,253	239	2,076		
	Total	740,394	248			

a. Dependent Variable: Willingness_to_buy

b. Predictors: (Constant), Complexity_highAge, Age_cent, Complexity_high_cent, Complexity_highTrust, Trust_cent, Experience_cent, Complexity_highExperience, Student_cent, Complexity_highStudent

Table 6.9: Coefficients complexity high moderation

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	4,075	,092		44,401	,000
	Trust_centr	,616	,063	,527	9,720	,000
	Experience_centr	,013	,087	,008	,145	,885
	Student	-,346	,238	-,100	-1,453	,147
	Age_centr	-,004	,010	-,030	-,431	,667
	Complexity_high	-,065	,192	-,018	-,338	,736
	Complexity_highExperience	,035	,181	,011	,194	,847
	Complexity_highTrust	-,251	,134	-,101	-1,870	,063
	Complexity_highStudent	-,189	,503	-,026	-,376	,707
	Complexity_highAge	-,015	,021	-,052	-,717	,474

a. Dependent Variable: Willingness_to_buy

Mediation analysis

Table 7.1: Complexity Mediation Analysis via PROCESS

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 3.5.3 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
 Documentation available in Hayes (2018). www.guilford.com/p/hayes3

Model : 4
 Y : Will
 X : CompMed
 M : Feelings

Covariates:
 CompHigh

Sample
 Size: 249

OUTCOME VARIABLE:
 Feelings

Model Summary

R	R-sq	MSE	F	df1	df2	p
,1590	,0253	107,2304	3,1898	2,0000	246,0000	,0429

Model

	coeff	se	t	p	LLCI	ULCI
constant	35,6173	1,1506	30,9560	,0000	33,3510	37,8835
CompMed	-3,6423	1,6322	-2,2315	,0266	-6,8572	-,4273
CompHigh	-,1855	1,5945	-,1163	,9075	-3,3260	2,9551

Standardized coefficients

	coeff
CompMed	-,3487
CompHigh	-,0085

OUTCOME VARIABLE:

Will

Model Summary

R	R-sq	MSE	F	df1	df2	p
,2189	,0479	2,8772	4,1113	3,0000	245,0000	,0072

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,9826	,4170	9,5507	,0000	3,1613	4,8040
CompMed	,8567	,2701	3,1722	,0017	,3248	1,3886
Feelings	-,0075	,0104	-,7167	,4742	-,0281	,0131
CompHigh	,2257	,2612	,8643	,3883	-,2887	,7402

Standardized coefficients

	coeff
CompMed	,4958
Feelings	-,0453
CompHigh	,0626

Test(s) of X by M interaction:

F	df1	df2	p
,2585	1,0000	244,0000	,6116

***** TOTAL EFFECT MODEL *****

OUTCOME VARIABLE:

Will

Model Summary

R	R-sq	MSE	F	df1	df2	p
,2143	,0459	2,8715	5,9218	2,0000	246,0000	,0031

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,7160	,1883	19,7365	,0000	3,3452	4,0869
CompMed	,8840	,2671	3,3094	,0011	,3579	1,4101
CompHigh	,2271	,2609	,8705	,3849	-,2868	,7411

Standardized coefficients

	coeff
CompMed	,5116
CompHigh	,0630

***** CORRELATIONS BETWEEN MODEL RESIDUALS *****

	Feelings	Will
Feelings	1,0000	,0000
Will	,0000	1,0000

***** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *****


```

Total effect of X on Y
  Effect      se      t      p      LLCI      ULCI      c_ps
  ,8840      ,2671    3,3094  ,0011  ,3579      1,4101  ,5116

Direct effect of X on Y
  Effect      se      t      p      LLCI      ULCI      c'_ps
  ,8567      ,2701    3,1722  ,0017  ,3248      1,3886  ,4958

Indirect effect(s) of X on Y:
  Effect      BootSE    BootLLCI    BootULCI
Feelings      ,0273      ,0478      -,0682      ,1382

Partially standardized indirect effect(s) of X on Y:
  Effect      BootSE    BootLLCI    BootULCI
Feelings      ,0158      ,0280      -,0386      ,0817

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  1000

NOTE: Standardized coefficients for dichotomous or multicategorical X are in
      partially standardized form.

----- END MATRIX -----

```

Table 7.2: Complexity (reversed dummies) Mediation Analysis via PROCESS

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 3.5.3 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

Model : 4
Y : Will
X : CompHigh
M : Feelings

Covariates:
CompMed

Sample
Size: 249

OUTCOME VARIABLE:
Feelings

Model Summary

	R	R-sq	MSE	F	df1	df2	p
--	---	------	-----	---	-----	-----	---

,1590 ,0253 107,2304 3,1898 2,0000 246,0000 ,0429

Model

	coeff	se	t	p	LLCI	ULCI
constant	35,6173	1,1506	30,9560	,0000	33,3510	37,8835
CompHigh	-,1855	1,5945	-,1163	,9075	-3,3260	2,9551
CompMed	-3,6423	1,6322	-2,2315	,0266	-6,8572	-,4273

Standardized coefficients

	coeff
CompHigh	-,0178
CompMed	-,1631

OUTCOME VARIABLE:

Will

Model Summary

R	R-sq	MSE	F	df1	df2	p
,2189	,0479	2,8772	4,1113	3,0000	245,0000	,0072

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,9826	,4170	9,5507	,0000	3,1613	4,8040
CompHigh	,2257	,2612	,8643	,3883	-,2887	,7402
Feelings	-,0075	,0104	-,7167	,4742	-,0281	,0131
CompMed	,8567	,2701	3,1722	,0017	,3248	1,3886

Standardized coefficients

	coeff
CompHigh	,1307
Feelings	-,0453
CompMed	,2320

Test(s) of X by M interaction:

F	df1	df2	p
,0028	1,0000	244,0000	,9576

***** TOTAL EFFECT MODEL *****

OUTCOME VARIABLE:

Will

Model Summary

R	R-sq	MSE	F	df1	df2	p
,2143	,0459	2,8715	5,9218	2,0000	246,0000	,0031

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,7160	,1883	19,7365	,0000	3,3452	4,0869
CompHigh	,2271	,2609	,8705	,3849	-,2868	,7411
CompMed	,8840	,2671	3,3094	,0011	,3579	1,4101

Standardized coefficients

	coeff
CompHigh	,1315
CompMed	,2394

***** CORRELATIONS BETWEEN MODEL RESIDUALS *****

	Feelings	Will
Feelings	1,0000	,0000

```

Will          ,0000      1,0000

***** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *****

Total effect of X on Y
  Effect      se          t          p      LLCI      ULCI      c'_ps
  ,2271      ,2609      ,8705      ,3849     -,2868      ,7411      ,1315

Direct effect of X on Y
  Effect      se          t          p      LLCI      ULCI      c'_ps
  ,2257      ,2612      ,8643      ,3883     -,2887      ,7402      ,1307

Indirect effect(s) of X on Y:
  Effect      BootSE      BootLLCI      BootULCI
Feelings      ,0014      ,0227      -,0493      ,0514

Partially standardized indirect effect(s) of X on Y:
  Effect      BootSE      BootLLCI      BootULCI
Feelings      ,0008      ,0132      -,0287      ,0311

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:
  95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  1000

NOTE: Standardized coefficients for dichotomous or multicategorical X are in
      partially standardized form.

----- END MATRIX -----

```

Table 7.3: Complementary Mediation Analysis via PROCESS

```

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 3.5.3 *****

      Written by Andrew F. Hayes, Ph.D.      www.afhayes.com
      Documentation available in Hayes (2018). www.guilford.com/p/hayes3

*****

Model   : 4
  Y     : Will
  X     : Complem
  M     : Feel

Sample
Size:   249

*****
OUTCOME VARIABLE:

```

Feel

Model Summary

	R	R-sq	MSE	F	df1	df2	p
	,0168	,0003	1,0323	,0699	1,0000	247,0000	,7917

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,1352	,0920	34,0842	,0000	2,9541	3,3164
Complem	,0340	,1288	,2643	,7917	-,2196	,2877

Standardized coefficients

	coeff
Complem	,0336

OUTCOME VARIABLE:

Will

Model Summary

	R	R-sq	MSE	F	df1	df2	p
	,0981	,0096	2,9807	1,1960	2,0000	246,0000	,3042

Model

	coeff	se	t	p	LLCI	ULCI
constant	4,6305	,3733	12,4044	,0000	3,8952	5,3657
Complem	-,1265	,2189	-,5781	,5637	-,5577	,3046
Feel	-,1540	,1081	-1,4246	,1555	-,3670	,0589

Standardized coefficients

	coeff
Complem	-,0732
Feel	-,0904

Test(s) of X by M interaction:

	F	df1	df2	p
	1,6200	1,0000	245,0000	,2043

***** TOTAL EFFECT MODEL *****

OUTCOME VARIABLE:

Will

Model Summary

	R	R-sq	MSE	F	df1	df2	p
	,0382	,0015	2,9932	,3611	1,0000	247,0000	,5485

Model

	coeff	se	t	p	LLCI	ULCI
constant	4,1475	,1566	26,4792	,0000	3,8390	4,4560
Complem	-,1318	,2193	-,6009	,5485	-,5638	,3002

Standardized coefficients

	coeff
Complem	-,0763

***** CORRELATIONS BETWEEN MODEL RESIDUALS *****

	Feel	Will
Feel	1,0000	,0000
Will	,0000	1,0000

***** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y *****

Total effect of X on Y

Effect	se	t	p	LLCI	ULCI	c _p
-,1318	,2193	-,6009	,5485	-,5638	,3002	-,0763

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI	c _p
-,1265	,2189	-,5781	,5637	-,5577	,3046	-,0732

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Feel	-,0052	,0248	-,0577	,0497

Partially standardized indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Feel	-,0030	,0144	-,0334	,0289

***** ANALYSIS NOTES AND ERRORS *****

Level of confidence for all confidence intervals in output:

95,0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

5000

NOTE: Standardized coefficients for dichotomous or multicategorical X are in partially standardized form.

----- END MATRIX -----