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Choosing not to choose is a choice in itself

An experiment on choice deferral

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Executive Summary

Nowadays, people are confronted with plenty of options. There is always so much to choose from, especially in the online environment. Yet, the conversion rates are low. Only 3% of people who browse e-commerce websites end up buying a product. The figures are even lower for electronic devices, where only 1.4% make a choice to purchase an item. This thesis analyses the too-much choice phenomenon, and whether the abundance of options leads to choice deferral. This is investigated through an experiment in a simulated e-commerce store, where users have to make a choice between multiple pairs of headphones. Headphones are currently a popular gadget, and it has been the most bought product during the lockdown.

Prior research found that the size of the assortment matters. The higher the assortment, the higher the chance for choice deferral. It has been argued that too many options make it difficult to decide, which further leads to regret and deferral. However, some researchers have opposing views, and are in favour of a larger assortment, as it brings satisfaction for more consumers. Nevertheless, the amount of options is not the only factor leading to deferral. Choice set complexity, through the aspect of dominated options versus equally attractive options, was also thought to influence deferral. A consumer choosing between products similar in attractiveness will have a harder time to make up their mind, as it induces a high conflict situation. Conversely, it is easier to choose when there is a clearly better product, from all standpoints, such as quality, price and aesthetic reasons. When time pressure is added to the mix, the consumer should be incentivised to buy the product quicker, based on the "perceived-cost of time scarcity". Although, too much time pressure could have an opposite effect, increasing negative emotions and leading to deferral.

In a 2x2 between-subjects design, an experiment was conducted to test the effect of assortment size, choice set complexity and time pressure on deferral. Additional control variables such as perceived uncertainty, online shopping experience and demographics were analysed. Though manipulation checks have been successful, and respondents correctly perceived the constructs in the conditions, no effect has been significant. Therefore, no proposed hypothesis has gathered enough evidence to be supported. It is necessary to make further research about what leads to choice deferral, including, but not limited to the constructs studied in this paper.

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Chapter 1: Introduction

1.1 Background

It's Saturday night and you feel like watching a movie. You log into Netflix, HBO, Amazon Prime or your preferred streaming service provider and see thousands of options. You have no idea what to choose, there are so many options. Trying to find an entertaining movie, you keep scrolling down and catch a glimpse at the time; you have just wasted one hour, while looking for the best option. You decide to turn off your computer and go on social media, instead.

There's a high probability this has happened to you before. It shows how difficult it is to make a choice when there are too many options. Consumers are confronted with this everywhere. From choosing a movie, to buying groceries, looking for an electronic gadget, finding a flattering pair of jeans or the best gift for your friend. Making a choice became increasingly difficult, especially with the rise of online shopping. The assortment size of online products seems to be unlimited, with some consumers experiencing internet shopping anxiety, as a result of choice overload (Nagar & Gandotra, 2016). Additionally, encountering complex choices, where products have a wide variety of attributes, and all the options seem to be good, contribute to the difficulty of making a choice. This is known as the choice set complexity, a main factor of choice overload, which influences assortment size and choice overload (Chernev et al., 2015). Lastly, many choices made by customers face a sense of urgency, known as time pressure, a phenomenon encountered especially during limited time offers, or discounts (Godinho et al., 2016).

Choice overload doesn't affect only consumers. More so, it affects companies' revenues and profits, and the success of the Marketing departments. If consumers decide not to choose, it results in low conversion rates and directly affects companies' sales. Therefore, it's important to understand why it happens and how to avoid the negative effects of choice overload (Godinho et al., 2016).

The purpose of this thesis is to investigate the relationship between assortment size and choice deferral. The central problem focuses on the effect of choice set complexity and time pressure, known to have an impact on choice overload (Chernev et al., 2015; Dhar & Nowlis, 1999). The

main hypothesis is that a high assortment size, choice set complexity, and the presence of time pressure, leads to choice deferral.

1.2 Research problem and motivation

Prior research showed that more options could lead to negative consequences, such as less motivation to make a choice, to commit to a choice, or decreased satisfaction with the chosen option (Scheibehenne et al., 2010). This is known as the "choice overload" phenomenon, (Iyengar & Lepper, 2000; Mogilner et al., 2008) or the "overchoice effect" (Gourville & Soman, 2005).

Consumers, when faced with a high assortment size, and product attributes, are thought to experience choice overload, catalysed by an information overload (Scheibehenne et al., 2010; McShane & Böckenholt, 2018). If these negative consequences are anticipated, the consumer could lose motivation to choose anything at all (Bell, 1982; Zeelenberg et al., 2000). Additionally, an extensive assortment size could lead to negative emotions, such as disappointment and regret (Schwartz, 2000).

This comes in contradiction with older studies, where more choice was linked to better options, and consumer satisfaction (Anderson et al., 1966). It is also the common belief among social scientists, that "added options can only make us better off" (Schwartz, 2004). Indeed, large assortments could have their own advantages, such as a higher chance of satisfying diverse consumer segments, reduced cost of looking for more options, provided that the assortment is made available all in one place, and a sense of novelty, meeting the desire for change (Scheibehenne et al., 2010).

While there are multiple studies (Chernev et al., 2015) on the relationship between assortment size and choice overload, in particular choice satisfaction, as the dependent variable, there are few studies on choice deferral. Choice deferral represents choice omission or an adaptive deferral strategy for the present time, as to postpone the choice for the future (Hutchinson, 2005). As making no choice could also be a choice, there is not much known about why consumers decide not to make a choice, and academic researchers encourage exploring the reasons why it happens.

Chernev et al., (2015) found four moderators for choice overload: choice set complexity, decision task difficulty, preference uncertainty and decision goal. Choice deferral, a consequence of choice overload, was one of the seven dependent measures, which studied the antecedents of choice overload. In this research, it has been found that when moderators are taken into account, there is a significant effect of assortment size of choice overload, choice set complexity has one of the strongest effects on choice overload. However, other studies showed contradictory results, that choice overload doesn't occur, when moderators are used, and choice deferral is the dependent variable. It was also shown that choice deferral is the dependent variable with the largest level of variation (McShane & Böckenholt, 2018). As there are opposing views on whether assortment size has an effect or not on choice overload, and choice deferral, in particular, there is a need to perform additional research. This paper will undergo a study to find out if a higher assortment size increases choice deferral, and whether choice set complexity and time pressure have an influence on consumers' desire not to choose.

Choice set complexity represents aspects of the decision that have an influence on the choice options, while it doesn't have to influence structural parts of the decision (Payne et al., 1993). In literature, it has been found that choice complexity is based on multiple factors, such as: the presence of a dominant option, the overall attractiveness of choice options, alignability and feature complementarity. They were thought to have an influence on the relationship between assortment size and choice overload. In particular, a higher level of choice set complexity, will lead to more choice overload (Chernev et al., 2015). Moreover, it has been found that increasing assortment size with only one additional attractive but conflicting alternative, increases the likelihood of choice deferral (Tversky & Shafir, 1992).

Prior research has found that time pressure has an effect on choice deferral (Dhar & Nowlis, 1999). However, there are contradicting results on whether a high choice conflict, a construct based on the attractiveness of the alternatives, a choice set complexity factor, leads to more or less choice deferral. Some researchers showed that consumers are less likely to choose when they are experiencing high conflict (Dhar 1997; Tversky & Shafir, 1992). High conflict was thought to appear when both alternatives were attractive, while low conflict - when there was a dominant option in the choice set. Meanwhile, Dhar & Nowlis (1999) found that under time pressure, choice deferral decreases when choice conflict is high, or both alternatives are of equal attractiveness. As

it is still unclear how time pressure influences choice deferral, when there is choice set complexity, this paper will perform a study to analyse its effect.

1.3 Research objectives

The first objective of this study is to identify if there is a relationship between assortment size and choice deferral. Particularly, if an increased assortment size leads to choice deferral. The second objective is to analyse the impact of choice set complexity and time pressure on the relationship between assortment size and choice deferral. The third objective is to observe if there is an interaction effect between choice set complexity and time pressure.

The main question of this research is:

"How does choice set complexity and time pressure influence the relationship between assortment size and choice deferral?"

To answer this research question, it is necessary to answer the following sub-questions:

1. What is the relationship between assortment size and choice deferral?
2. How does choice set complexity influence the relationship between assortment size and choice deferral?
3. How does time pressure influence the relationship between assortment size and choice deferral?
4. Is there an interaction effect between choice set complexity and time pressure?

1.4 Methodology

An online experiment will be conducted along with a survey administered by Qualtrics. There will be two groups of participants, a control and a treatment group. The participants will be introduced to a scenario where they will have to choose between an assortment of headphones. The product choice is justified by its appeal to a wide variety of consumer segments, students in particular, who will be the biggest demographic for this experiment. The control group will experience a small assortment size of 4 alternatives, while the treatment group will have to choose between 16 options, a method that was used in previous studies of choice overload (Chernev, 2006). The participants

will have both the options to choose or not to choose a product, testing the effect of assortment size on choice deferral, as seen in previous studies (Tversky & Shafir, 1992). The survey will then test for the effect of the moderators (choice set complexity and time pressure), by introducing additional conditions, and exposing each participant to a single condition, in a between-subject design.

The last part will consist of demographic questions, where the participant's gender, age, educational background, and home residency are asked. The data will be analysed using SPSS. The full description of the methodology can be found in Chapter 3, while the survey is added in Appendices.

1.5 Thesis Outline

The thesis is structured over 5 chapters. The first chapter presents basic knowledge about the topic and explains the research question. Chapter 2 is composed of a literature review on previous academic research on choice overload. This includes key themes of choice overload, such as assortment size, choice deferral, and moderators, choice set complexity and time pressure. Chapter 3 will present the methodology used for this study, including a detailed explanation of the survey, with questions further specified in the Appendices. Chapter 4 will include the results and the interpretation, while chapter 5 will form the final conclusions and discussion.

Chapter 2: Literature Review

2.1 Assortment size

There is a common belief that a higher assortment size makes individuals better off, and helps them enjoy better results (McShane & Böckenholt, 2018). As Schwartz (2004) said, "If we're rational, added options can only make us better off". However, prior research pointed out the "paradox of choice", where more choice doesn't always equal a better outcome (Schwartz, 2004). The advantages and disadvantages of large assortment sizes are described below.

One of the positive effects of a high assortment size is the increased probability of satisfying more consumers. More choice caters to diverse consumer segments, which benefits individuality and pluralism (Anderson, 2006). As more consumers are satisfied and decide to purchase a specific product, the producing company benefits from increased sales and consequently, higher profits. Previous studies found that companies that offer more choices have a higher competitive advantage, compared to those that other less. On the other hand, offering less variety doesn't always result in higher sales and offering fewer options might lead to reduced sales or no change (Scheibehenne et al., 2010). Other experiments (Berger et al., 2007) showed that a brand that has an expansive product line showcasing fine product distinctions, makes consumers perceive it as high-quality, which consequently gives it a competitive advantage.

Another advantage of a high assortment size deals with its practical benefits, particularly when the assortment is found all in one space, as the consumer can directly compare between options, can feel the general quality of the products, and saves time, by not having to search for additional options. These factors could contribute to more confident choices (Hutchinson, 2005). Additionally, it was found that more choices lead to a sense of freedom, as it gives novelty and meets the desire for change (Scheibehenne et al., 2010). Finally, research done by Anderson et al., (1966), showed that more options lead to more satisfaction with the choice made, particularly when all the options were seen as equally attractive.

However, more options aren't always better. Research pointed out that having too many options could lead to negative consequences, such as less motivation to choose, commit to a choice, or even make any choice (Iyengar & Lepper, 2000; McShane & Böckenholt, 2018). There are

opposing results, where scholars who were against high assortment size believed that having more options make a less satisfactory feeling with the final decision (Iyengar & Lepper, 2000). This comes into contradiction with early studies made by Anderson et al., (1966).

A high assortment size makes it more difficult to choose a product from a specific category, especially if these are all attractive options, a condition of choice complexity, and there is more information about each product and their attributes, or information overload (Scheibehenne et al., 2010). This was further confirmed by the same authors, who pointed out that having to make a choice becomes exhausting, as more time and effort are necessary when the consumer has to compare the products. Consequently, this could induce fears of making the wrong choice (Schwartz, 2004). Additionally, having more choices could increase consumers' expectations, which sometimes might not be met (Schwartz, 2000). Consequently, this could result in negative emotions, like regret and disappointment.

Previous research studied the effect of assortment size on choice overload from cheap everyday goods like toothpaste (Chernev, 2005) to expensive luxury goods like vacation packages, and durable goods like mobile phones and laptops (McShane & Böckenholt, 2018). A particularly popular experiment analysed the effect of jam assortments in a real-life scenario, a supermarket (Iyengar & Lepper, 2000). Researchers discovered that even though more consumers were attracted to the extensive selection of jams, and decided to approach the tasting booth with a high assortment size (24 types of jam), more consumers decided to purchase a product from the smaller assortment (6 types of jam). The exact results were striking: nearly 30% of consumers in the small assortment size purchased a jar of jam, while only 3% of the consumers in the large assortment size decided to do so. Additionally, Iyengar & Lepper (2000) performed another study in a non-retail environment, assessing Stanford University students' intrinsic motivation to write an essay. They found that more students who had to select a topic to write on from a limited choice set (6 topics) chose to complete the assignment (74%), while only 60% of students in the extensive choice set (30 topics), chose to do so. Also, the quality of essays written by students decreased, as the number of topics to choose from increased. All of these findings point out the negative effects of large assortments on choice overload, from purchasing in a supermarket, to simply choosing a topic to write on. Distinctly, a large assortment size could lead to choice deferral or the act of not making any choice at all.

H1: Consumers choosing from a large assortment size are more likely to defer their choice than consumers choosing from a small assortment size.

2.2 Choice deferral

Sometimes, making no choice could be a choice in itself. Deferring a choice has multiple reasons, such as procrastination, a predisposition for the status quo, a trade-off between making an effort and enjoying likely benefits, or waiting for better future options (Anderson, 2003). In contrast, non-choice deferral represents making the decision when it's necessary to do so, while not experiencing refusal or time delay (Wei et al., 2021). While most research on choice overload focuses on which option the consumer decides to choose, and on the aspects of choice satisfaction, regret or confidence, choice deferral is often ignored (White et al., 2015). Nevertheless, avoiding choosing could be even more common than making a choice. A study showed that out of people who placed items in an online shopping basket, only 25% actually made a purchase (Cho et al., 2006). Another study showed that only 51% of people who came into an electronics store and wanted to buy a gadget and thought about their options for 5 minutes' minimum, made a final purchase (Heitmannet al., 2007). For marketers, in particular, it's important to understand why consumers decide not to choose, and how to avoid that. Therefore, they have to choose whether to offer smaller assortments or larger assortments (White et al., 2015).

Choice deferral can be linked to absolute evaluations or relative comparisons, where the consumer doesn't choose anything because no option is good enough, or they are unsure which is the best one (White et al., 2015). While the former is based on the reasoning that no option has the minimum level of attractiveness that the consumer is looking for (White et al., 2015), the latter involves a comparison with other present alternatives that are equally attractive (Dhar, 1997).

Absolute evaluations and relative comparisons are performed as processing stages, on a "two-stage, two-threshold" (2S2T) framework, conceptualized by White et al., (2015). The absolute processing stage represents an evaluation of each option, either based on product attributes or other alternatives (White et al., 2015). Each option has a specific perceived utility, which is then compared to the utility threshold, or the minimum desired level of attractiveness. Further, the consumer eliminates each option that doesn't pass the utility threshold. The final decision is taken

based on the options that survived the elimination strategy. If no option is left, and there is not a great need to obtain an option, then the consumer defers their choice. However, if the consumer has the urgency to obtain an option, or has a great need to do so, then at least one option will survive the test. In another case, if more options survived the absolute processing stage, a further elimination has to be done. The next step is the relative processing stage, where the remaining options are compared with each other. In contrast to absolute processing, relative processing involves a comparison between the level of attractiveness of options in the choice set. The final chosen option has to pass the confidence threshold, if not, the choice is deferred. At the same time, if the consumer has a great need to choose an option, the relative processing will be continued (White et al., 2015). Unattractive alternatives are linked to choice difficulty, a factor that further influences choice deferral. Prior research showed that people are more likely not to choose when alternatives are equally attractive, but they are not identical (Dhar, 1997; Tversky & Shafir, 1992). In contrast, it's easy to make a choice when there is a dominant option, an option that has superior qualities. Adding just a single new alternative to the choice set can increase choice deferral, by inducing a high-conflict context.

The relationship between assortment size and choice deferral was also studied as part of an experiment series by White et al., (2015). The results were surprising, even though similar choice sets were used. In one part of an experiment, as assortment size increased, choice deferral also increased, proving the too much choice effect. In another part of an experiment, the opposite was true: choice deferral decreased as assortment size increased. Therefore, it's important to test the hypothesis on whether large assortment sizes lead to choice deferral.

2.3 Choice set complexity

Choice set complexity is an extrinsic factor and an antecedent of choice overload, catalysed by an increase in assortment size (Chernev et al., 2015). In theory, extrinsic factors explain the decision problem and are similar across individuals. On the other hand, intrinsic factors are particular to each individual. Further, extrinsic factors are divided between task and context factors. While task factors reflect structural characteristics of the decision, such as time pressure, context factors describe the decision features linked to specific values of the available options (Chernev et al., 2015). In this case, choice set complexity is a context factor. Next, choice set complexity is not a

unidimensional factor but is based on multiple aspects, such as the presence of a dominant option, the overall attractiveness of choice options, alignability, and feature complementarity. All these factors are thought to affect assortment size and choice overload. Literature has found that a higher choice complexity, rationalized by the four explaining factors, leads to a higher choice overload (Chernev et al., 2015). As choice deferral is a choice overload consequence, specifically a behavioural outcome, this paper will test if a high choice complexity also leads to choice deferral and if it has an effect on assortment size. Based on prior research by the same authors, all choice set complexity factors have similar explanatory power. Therefore, this paper will analyse the first factor, the dominant option, compared to equally attractive options, described below.

2.3.1 Dominant option

A choice set complexity factor is the presence of a dominant option. A dominant option is superior and better than all the other available options in the choice set (Huber et al., 1982). Researchers assumed that a necessary precondition for choice overload was the exclusion of a dominant option (Scheibehenne et al., 2010). It was found that choice overload can only occur if there is a large number of non-dominated options or equally attractive options, and there is no dominant option in the choice set. Prior literature also showed that if a choice set includes a dominant option, consumers are more likely to buy a product from the assortment, and it also reduces choice overload in a large assortment (Chernev et al., 2015). At the same time, if there is an inferior option in the choice set, consumers are also more likely to purchase a product, as it makes another option seem more dominant (Dhar, 1997). In contrast, if a consumer has to choose between similar options, which are equally attractive, there is a high probability that the choice will be deferred (Dhar, 1997; Tversky & Shafir, 1992). A reason for this phenomenon could be that similar or equally attractive options are harder to compare with each other, as more cognitive effort is necessary to undergo the task, which increases decision difficulty, and leads to a “no-choice” option. However, prior research analysed the effect of equally attractive and dominant options in a small assortment size, where adding only an additional option could lead to choice deferral (Dhar, 1997; Tversky & Shafir, 1992). It is necessary to perform additional research on a large assortment size, to see whether the effect stays the same.

H2: Relatively equally attractive options in the choice set increase the likelihood of choice deferral, while a dominant option in the choice set decreases the likelihood of choice deferral.

2.3.2 Attractiveness of the choice options

Attractiveness of the choice options has an impact on the assortment size and choice overload. Assortments which include options that are of better quality are likely to be viewed as more appealing. At the same time, assortments which contain options that are of worse quality are likely to be perceived as less appealing (Chernev et al., 2015). Prior research suggested that attractiveness of options influences how consumers choose among assortments. It was shown that smaller assortments are preferred over larger ones when they include more attractive choice options (Chernev & Hamilton, 2009). One reason could be that if all options have a high degree of attractiveness, they are more similar to each other, which makes it more difficult to compare them. This results in an increased cognitive effort and makes it less likely for a consumer to prefer large assortments. Instead, there is a higher likelihood for consumers to prefer small assortments when they include attractive options from large assortments, reducing cognitive effort.

2.3.3 Alignability

Alignability was also shown to have an effect between assortment size and choice overload. Alignability is a construct related to the attribute levels of the choice set options, and the relationships between them. While alignable attributes signify that choice options have a specific attribute, yet different levels of it, in non-alignable attributes one option possesses a specific attribute, while others don't (Chernev et al., 2015). This makes non-alignable attributes harder to compare with each other, as they have different features, which consequently increases cognitive effort. Prior research has found that the effect of assortment size on choice overload varies based on whether attributes are alignable or non-alignable. In alignable attributes, by increasing the assortment size, there is a higher purchase probability, while in non-alignable attributes the opposite is true (Gourville & Soman, 2005). The same study showed that consumers who have to choose from a non-alignable brand assortment experience an increased cognitive effort, switching to an alignable brand, instead.

2.3.4 Feature complementarity

Feature complementarity is a construct which relates to the degree a product possesses features that complement each other, based on their capacity to meet a certain consumer need (Chernev et al., 2015). Whereas complementary products are used to meet different aspects of a consumer's need, substitute products meet the same need (Chernev, 2005). It was argued that complementary features tend to decrease the purchase likelihood, therefore increasing choice deferral, as it lowers the attractiveness of choice options in the assortment. Meanwhile, increasing the assortment size by additional non-complementary options leads to a higher purchase likelihood and a lower choice deferral. This was shown by an example of a toothpaste, where the original attribute was cavity protection, and the additional complementary feature was tartar control. It was argued that the new complementary feature made the original product seem inferior and that increasing the assortment size with additional features lowers the attractiveness of other alternatives (Chernev, 2005).

2.4 Time pressure

Decision-making in real life involves time constraints. Many times, consumers make decisions, while facing time pressure. From promotion deadlines to possibilities of product stock-out, or even physical store opening hours, consumers are pressured for time (Godinho et al., 2016). Theoretically, time pressure is defined as a "perceived cost of time scarcity" (Godinho et al., 2016). Marketers use tools such as "limited-time-only" or "limited edition", as a measure to combat choice deferral (Dhar, 1997). A popular example is Amazon's "Lightning Deal", where products are offered on promotion on a limited-time basis, usually only up to 12 hours. Another example is Black Friday, one of the biggest shopping days in the United States, created to boost sales.

Prior research showed that when consumers have to decide under time constraints, they spend less time examining the available information while focusing on important attributes and using information filtering tools (Dhar & Nowlis, 1999). Further, consumers change their decision strategy, by switching from a compensatory to a non-compensatory decision strategy, to simplify the decision (Dhar & Nowlis, 1999). In theory, a compensatory decision strategy involves an extensive analysis of information, while a non-compensatory strategy simplifies the task (Godinho

et al., 2016). In line with this, literature has indicated that choosing from large assortments and under time pressure, consumers experience less satisfaction and more regret with the final choice, because of information overload and choice difficulty (Inbar et al., 2008). However, time pressure can also act as a catalyst for taking action. In a study by Tversky & Shafir (1992), students had to complete a questionnaire, and the treatment group had a time limit. It was found that students who were given no time limit, were less likely to complete the survey and that the more time they had to complete a task, the less likely they were to actually do it. In a study of coupon usage, researchers found that consumers were more likely to redeem the coupon when it was near the expiration date (Inman & McAlister, 1994). This shows that time limit drives action, and researchers came up with suggestions for marketers to use deadlines and limited promotions as a measure of reducing choice deferral when there are attractive alternatives (Dhar, 1997).

H3: Under high time pressure, consumers who choose from a large assortment size, are less likely to defer their choice, than consumers who choose under low time pressure.

Previous studies indicated that time pressure has a different effect based on the context (Dhar, 1997). The context assumes whether the decision-maker has to choose between equally attractive options, or there is a dominant option in the choice set. The new condition adds time constraints to the previous experiment. First, it's important to define equally attractive options and dominant options. In a Dhar & Nowlis (1999) study, equally attractive options were constituted of a higher-quality brand and of a lower-quality brand, with different prices and attributes. The decision difficulty was whether to choose a product from a higher-quality brand, with better attributes, but a higher price, or to choose the lower-quality brand, with worse attributes, but a lower price. In contrast, a dominant option in the choice set had the same price and features as the other one but was a higher-quality brand. Consumers are more likely to choose under time pressure between equally attractive choice options, a factor that describes choice complexity. Therefore, which was previously seen as a high-conflict situation, where consumers found it more challenging to decide, was fixed under the condition of time constraints. Using time limits influenced decision-makers to use strategies that avoid making comparisons in trade-off situations. This made a high-conflict decision easier, which led to less choice deferral. However, when the choice was easy from the start, as in having a dominant option in the choice set, there wasn't a significant difference in time pressure effect on choice deferral (Dhar & Nowlis, 1999). It is necessary to mention that previous

research studied the effect of time pressure on choice deferral, without taking into account choice overload. Here, time constraints will be introduced in an overloaded choice environment, which assumes a large assortment size.

H4: Under high time pressure, consumers are less likely to defer their choices, when choosing between equally attractive choice options, while a dominant option in the choice set has no significant difference in the time pressure effect on choice deferral.

Additionally, it was found that when choosing under time pressure, more attention is paid to unique features in the choice set, instead of the commonly shared features (Dhar & Nowlis, 1999). In contrast, when there was no time pressure, shared features had a greater weight in the deferral decision. However, it was not only the uniqueness of the choice options, that had an impact on choice deferral but whether they were positive or negative features. A study showed that when consumers were presented with two options that possess unique and positive features, a "unique-good pair", they were more likely to choose one of them, under time pressure. Contrary, if they had to choose between unique and negative features, a "unique-bad pair", the likelihood of making a choice did not decrease under time pressure (Dhar & Nowlis, 1999).

2.5 Hypotheses Overview

Hypotheses Overview
H1 Consumers choosing from a large assortment size are more likely to defer their choice, than consumers choosing from a small assortment size.
H2 Relatively equally attractive options in the choice set increase the likelihood of choice deferral, while a dominant option in the choice set decreases the likelihood of choice deferral.

H3 Under high time pressure, consumers who choose from a large assortment size, are less likely to defer their choice, than consumers who choose under low time pressure.
H4 Under high time pressure, consumers are less likely to defer their choices, when choosing between equally attractive choice options, while a dominant option in the choice set has no significant difference in the time pressure effect on choice deferral.

Table 1: Hypotheses Overview

2.6 Conceptual Framework

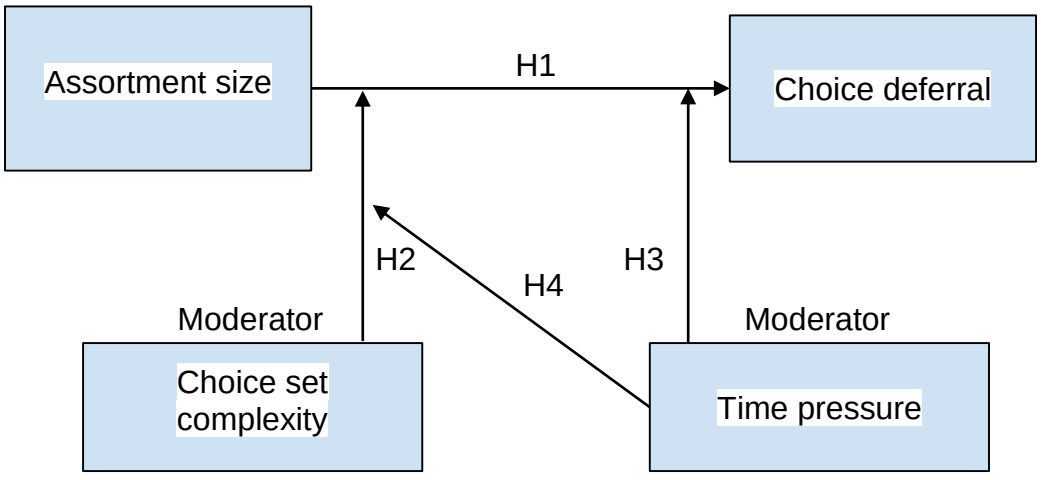

Figure 1: Conceptual Framework

Chapter 3: Methodology

3.1 Research Design

The research design constitutes the plan and procedures that involves several decisions, based on broad assumptions and methods of data collection and analysis (Creswell & Creswell, 2017). It is important to carefully choose the appropriate research design, based on the research problem and objectives, in order to obtain accurate information and minimize experimental error (Malhotra & Birks, 2007). This research investigates the impact of assortment size on choice deferral, with moderating effects of time pressure and choice set complexity. As such, a quantitative research approach was the chosen design, because it best captures the relationship between variables, and tests the proposed hypotheses (Creswell & Creswell, 2017). Consequently, this is causal research, as it analyses a cause, assortment size, and an effect, choice deferral. To test causal structures, an experiment was regarded as one of the best choices, because it provides appropriate results, which made it become increasingly popular in marketing research. However, it has a couple of downsides such as time, costs, and administration (Malhotra & Birks, 2007). The experiment will take place online, as it's an efficient method to reach a higher number of respondents while being cost-effective. A between-subjects design will be used, where each participant will only be exposed to one treatment condition, instead of a within-subjects design, where the same respondent goes through all the conditions. Advantages of a between-subjects design include reducing the potential for carryover effects, where participants could learn procedures during the experiment, leading to transfer of knowledge and a change of behaviour, which ultimately contributes to biased outcomes (Allen, 2017). Another advantage is reduced fatigue in participants, as between-subjects' designs are short and easy to set up. The main downside is the need for additional resources, as more time is used to reach the necessary number of respondents.

In the study, a full factorial 2 x 2 x 2 between-subjects design will be used. In the first four conditions, assortment size and choice set complexity will be tested, without time pressure. The next four conditions (5,6,7,8) will include the duplicated initial conditions, while also manipulating time pressure. Table 2 shows the conditions used in the study.

Table 2: Experimental conditions

Without time pressure	**Choice set complexity**	
Assortment size	Low	High
Low	Condition 1	Condition 3
High	Condition 2	Condition 4
With time pressure	**Choice set complexity**	
Assortment size	Low	High
Low	Condition 5	Condition 7
High	Condition 6	Condition 8

In order to improve the reliability and validity of the experiment results, it's necessary to control for extraneous variables, such as selection bias (Malhotra & Birks, 2007). This helps obtain internal validity, where independent variables actually cause the effects on the dependent variable, and external validity, where the causal effect can be generalized outside the experimental settings. While it's preferable to have both internal and external validity, in an experiment, usually a trade-off has to be made. In this research, due to resource constraints, the experiment will be conducted in an artificial environment, with a carefully selected number of product choices and attributes, which will improve the internal validity, while reducing external validity. To control for extraneous variables, randomization will be performed. By definition, randomization means randomly assigning treatment conditions to participants (Malhotra & Birks, 2007). This ensures that extraneous variables are equally present in each treatment condition, which further improves the reliability of the experiment. For this study, a mix of convenience and voluntary response sampling will be used (Malhotra & Birks, 2007). The convenience sample is easily available to the researcher, where they directly contact the participants, while in the voluntary response sample, participants volunteer themselves. Both sampling methods are easy to access and low-cost, but responses could suffer from non-probability reasons, as there is little way to measure if the sample is a true representation of the population.

3.2 Measures

3.2.1 Independent variable

The independent variable in the experiment is assortment size. It was manipulated by choosing two assortment sizes, small and large. The small assortment size had 4 choices, which is below the

processing capacity of individuals. This is in line with previous research on cognitive overload, which found that individuals can only process up to 6 product alternatives (Bettman, 1979; Malhotra, 1982; Wright, 1975; Chernev, 2006). The large assortment size contained four times more alternatives than the small assortment. Previous researchers used the same rapport in choice overload studies (Iyengar and Lepper, 2000; Chernev, 2006; White & Hoffrage, 2009). Options in the small assortment were also included in the large assortment, similar to Chernev's (2006) prior study. In both the low and the high assortment size, respondents had the option to select "I would like to search later", as the 5th and the 17th option, respectively. To check the perceived assortment size manipulation, participants were asked: "How do you evaluate the options available?" on a 7-point Likert scale (1 = Few chances of finding the best option to 7 = A lot of chances to finding the best option), as used by Godinho et al. (2016) and Iyengar & Lepper (2000) originally in a 9-point Likert scale, and adapted.

3.2.2 Dependent variable

Choice deferral was measured by participants selecting the button "Search later", as the last option in the choice set, present in all conditions. This was previously implemented in research by Godinho et al. (2016).

3.2.3 Moderators

Choice set complexity was measured on the dominant option dimension. A group was presented with relatively equally attractive products, with no dominant option present. This made it a high choice complexity, as it induced a high conflict, which made it harder to commit to a choice. Relatively equally attractive options were not identical, as all of them had certain advantages and disadvantages, which required the participant to make trade-offs (Tversky & Shaffir, 1992). In the choice set, participants had to choose between products with better features, and higher prices or products from with worse features, and lower prices. In this experiment, headphones were the chosen product, a consumer electronic device. This is consistent with prior research, where television, binoculars, telephones, camera, and laptops were the products of choice (Dhar & Nowlis, 1999; Godinho et al.,2016; Tversky & Shaffir, 1992). The available products (headphones) were from the middle and basic class, in the middle and low price range, selected

from current Bol and Amazon product options. The group presented with a dominant option had to choose between products with similar features and price, but where one had a better class. All the selected products were wireless, but had 3 other distinct features: battery life; noise cancellation or none; high-resolution audio, or none. Products were chosen based on 4 attributes: 3 features, and price, in line with Dhar & Nowlis (1999) prior research. Other studies created a similar environment but only tested 2 products in the choice set (Tversky & Shaffir, 1992; Dhar & Nowlis, 1999; Li et al., 2017). Participants were asked to rate the attractiveness of the presented products on a 7-point Likert scale (1= Not at all attractive to 7= Very attractive), as a manipulation check for the product selection. This was adapted from the original 9-point Likert scale in Li et al., (2017) experiment.

Time pressure is often used in online shopping environments. E-commerce websites such as Amazon and Bolt often use promotion deadlines and stock-out threats as a tactic to pressure customers to purchase new items. In order to simulate a realistic online shopping environment, time pressure was manipulated by giving participants a limited time to make their decision and showing a timer that is counting down. This was proven in previous studies on time pressure and choice deferral (Godinho et al.,2016; Dhar & Nowlis, 1999). In one study, participants were given 15 seconds to choose between 2 alternatives in the treatment group, and unlimited time in the control group (Dhar & Nowlis, 1999). In another study, participants had a 3-minute time limit to choose between 32 products, in the large assortment group, or between 8 products, in the small assortment (Godinho et al.,2016). This study had a 1,5-minute time limit for both the small assortment of 4 products and the large assortment, of 16 products. It is expected that time pressure will have a high effect on choice deferral for the selected product (headphones), as it's a high involvement product, which is more difficult for the decision maker to choose, as there are more attributes to consider, inducing cognitive overload (Peng et al., 2019). As a manipulation check, a scale by Dhar & Nowlis (1999) and Godinho et al. (2016) was used. Originally a 9-point Likert scale, it was adapted to a 7-point Likert scale. Participants were asked after completing their responses: "How pressured did you feel when making your choice?" from (1= No pressure to 7= Highly pressured) and "How fast did you need to make your decisions?" from (1= Not at all fast to 7= Very fast).

3.2.4 Control variables

In this study, 6 control variables were studied: age, gender, education, online shopping experience, preference uncertainty, and realism of the experimental scenario. Age is said to affect individuals' choice behaviour, particularly older adults were more likely to defer choices, than young adults (Pethtel & Chen, 2013). Meanwhile, researchers showed different results on the impact of gender on choice behaviour. While some found that it has no influence on choice, (Iyengar and Lepper, 2000), others showed statistically significant results between gender and consumer preference (Pirlympou, 2017). The online shopping experience was linked to consumer choice behaviour. Novice online consumers suffered more from information overload, making them defer choices often (Chen et al., 2009). On the other hand, experts made better decisions in an overloaded choice environment. Preference uncertainty was controlled by measuring participants' knowledge about electronic devices and headphones. In Hao et al., (2010) subjective knowledge scale, the participants read the statement "I am knowledgeable about this product" and rated it on a 7-point Likert scale. A final question was asked to identify if participants felt as if they were making a real decision "How likely would you be to encounter such products in a real-life scenario?", on a 7-point Likert scale, adjusted from Godinho et al. (2016). Lastly, the level of education was controlled by the study.

3.3 Experimental Design

The experiment was conducted using an online survey, administered by Qualtrics. The main distribution platforms were Facebook, Linkedin, and Whatsapp, as it was convenient, and made use of researchers' personal contacts. Additionally, platforms such as SurveySwap were used, because they helped obtain a higher reach in a shorter amount of time. The distribution of the survey took place in August and September 2022. The study had a between-subject design, therefore, each participant was exposed to a single treatment condition. The target group for this study was university students, recent graduates, and young adults, as they were more likely to use online shopping, and had a higher likelihood of showing interest in electronic devices, such as headphones (Comegys & Brennan, 2008). The participants were given a financial incentive by having the chance to win a 25€ voucher. This was thought to motivate users to participate in research studies (Camerer & Hogarth, 1999).

The survey began with an introduction, which had background information about the research, but it was brief and general, to control for participants' expectations so that they weren't made aware of the tested hypotheses (Cozby & Bates, 2014). This helped ensure that participants would answer truthfully, and not try to cooperate with the researcher, by trying to confirm the hypotheses. Further, participants were told that their data would be treated confidentially.

The experiment started by asking the participants to imagine that they were online shopping for a new pair of headphones. They were told that each pair had 5 attributes, class type, 3 features, and price. They were told to carefully assess each product, and make a choice whether to buy one of them or not. The participants were given the option not to choose if they would have liked to, and instead, search later for another product. The instructions mentioned that the decision had to be taken as close to a real-life situation as possible. The participants were randomly selected to one of the 8 treatment conditions: either a small assortment of 4 options or a large assortment of 16 options, with a dominant option present in the choice set, or with relatively equally attractive options, with a time limit, or unlimited time. The headphones available in the small assortment were also available in the large assortment. The order of different headphone sets was randomized in each treatment group. After the participants selected a product or chose not to select anything, either by clicking on the "Search later" button or on the next question, they were asked a series of questions, to check if the manipulation of variables was successful. First, they were asked a question about the perceived assortment size. Next, they were asked two questions about the perceived time pressure. Further, they were asked questions about their online shopping experience, perceived uncertainty, and the realism of the experiment. Lastly, participants had to answer three demographical questions about their age, gender, and education. Choice set complexity was also measured by rating the attractiveness of each displayed product, to assess if there was a perceived difference between relatively equally attractive products and a dominant option. At the end of the study, the participants were thanked for their time and were requested to fill in their email addresses, in order to announce them if they won the 25€ voucher.

3.4 Data Analysis

The data collected from this study was imported into SPSS, a statistical software that allows for analysis of the acquired data. Multiple statistical methods were used to analyse the data.

Independent sample t-tests were conducted to test for significant mean differences between small and large assortments. Binary logistic regressions were used to test the relationship between the dependent variable (choice deferral) which is binary, and the independent variables (assortment size, time pressure and choice set complexity). The data analysis was adjusted based on the quality of the acquired data, which is discussed in the next chapter.

3.5 Pre-test

A pre-test was conducted to make sure that the survey was correctly designed. The goal was to verify whether the manipulations were successful. After the survey was published, 25 respondents participated in the experiment and filled out the survey. These first results were exported into SPSS to analyse the data and measure the reliability and validity of the study. It was decided to choose 25 respondents for the pre-test, based on prior research which recommended an amount between 12 and 50 respondents (Sudman, 1983; Sheatsley, 1983). The pre-test sample consisted of 64% females and 36% males, 44% of them were either 23 or 24 years old. Out of the total sample, 40% resided in the Netherlands and 16% in Romania. The pre-test results can be found in Appendix B, Tables 1-4.

3.5.1 Assortment size

Assortment size was measured by three items: “How do you evaluate the options available?”; “There were too many options in the choice set”; “There were enough options in the choice set”. Cronbach’s alpha showed a good amount of internal consistency (α=.737), therefore these three items were computed into a single average, assortment size. Next, an independent sample t-test was conducted to measure if there was a significant difference in perceived assortment size for respondents in the high and low assortment size conditions. The results showed that there was a significant difference between the two conditions, high size (M=5.33 SD=1.00), and low size (M=3.80 SD=1.21), $t(23)=3.35$ p=.003 (<.05). This means that the manipulation for assortment size was successful.

3.5.2 Choice set complexity

Choice set complexity was measured by three items: “Please rate the attractiveness of the presented products”; “The assortment was attractive”; “There was a relatively more attractive option on the choice set, compared to others”. Cronbach’s alpha was high (α=.969), and therefore the items were combined into a single new variable: complexity. An independent t-test found a significant difference between the high complexity (*M*=3.06 *SD*=0.51) and low complexity (*M*=5.76 *SD*=0.49), *t*(23)=-13,31 *p*<.001 (<.05). These results signify that participants in the low complexity conditions found the options more attractive than the participants in the high complexity conditions, as there was also a dominated option included in the choice set, while in the high complexity, all choices were relatively equally attractive. This manipulation for choice complexity was successful, too.

3.5.3 Time pressure

The three items measuring time pressure were “How pressured did you feel when making your choice?”; “How fast did you need to make your decisions?”; “I had enough time to make my decision”. The last item was recoded into a different variable with opposite values, as there is an inverse relationship between the third item and the previous two, which means that a respondent who was pressured for time and had to make their decision fast, would usually say that they did not have enough time to make the decision and think it thoroughly. Cronbach’s alpha was high (α=.918), and thus the items were combined into one variable, time pressure. However, the independent t-test did not find a significant difference between the respondents in time pressured conditions (*M*=3.08 *SD*=1.75), and those with no time pressure (*M*=2.69 *SD*=1.15), *t*(23)=0.663, *p*=.514(>.05). This shows that users in actual time pressure conditions only found the time pressure slightly higher, than those in no time pressure, yet the result is still not significant. In the pre-test, the conditions with time pressure had a 1.30-minute limit. This proved to be too much time for users to feel the time pressure. Therefore, the timed conditions were modified, and a new 45 seconds time limit was introduced. As this is half the time of the initial conditions, it is expected to obtain different results, with a significant difference between the means of the tested groups.

Chapter 4: Results

The research design described in the previous chapter served as the basis for the final experiment and survey created via Qualtrics. The survey was launched on the 18th of August, and it was distributed online, through social media, particularly Facebook, Instagram, Whatsapp, Linkedin, as well as through survey platforms, such as SurveySwap. Responses have been collected up until the 7th of September. During this period, the survey was completed by 265 respondents, but only 225 of them have finished the whole survey, by responding to all the questions. The first 25 respondents were used for the pre-test analysis, meant to verify the accuracy of the experimental design. After running the pre-test analysis, the survey has been adjusted, particularly the conditions with the time limit (conditions 5,6,7,8), therefore the first 25 responses were not included in the final dataset. In the end, a total of 200 responses have been recorded and used in the final dataset. In order to make sure that the data is accurate, the dataset had to be cleaned. Next, a set of manipulation checks were used, to verify whether the survey was successfully designed and the variables were correctly manipulated. Lastly, it was necessary to use descriptive statistics, to obtain a full picture of the sample.

The experiment kicked off with a brief summary of the research topic and provided general instructions. After reading the instructions, the participants had to tick off "I agree to participate", to proceed to the next page. Only one respondent chose the second option "I disagree to participate", and they were sent to the end of the survey. This respondent has been deleted from the final dataset. Additionally, 39 respondents did not finish the entire survey. They were also deleted from the dataset. In total, 40 responses were removed.

The survey included a scale which measured the realism of the experiment, based on prior research by Godinho et al. (2016). The goal was to measure whether the respondents thought that the experiment was realistic, so that it could actually happen in real life. This was verified by calculating the mean of the answers that measured experimental realism. Both questions had a mean above 5 points on the Likert scale, (5.04 and 5.10). The standard deviation was 1.631 and 1.510, respectively. Therefore, this proves that the scenario portrayed a realistic situation of a potential buyer in an e-commerce store. Additionally, each manipulated variable was studied on at least two items or questions. Using more than one item per selected variable helps obtain a

higher degree of reliability and consistency, while single-item questions and more prone to user error and biases (Bowling, 2005). To perform manipulation checks, the multiple items had to be recoded into single factors. They could only become a single factor if the internal reliability was high, which is over 0.65 (Goforth, 2015).

4.1.1 Manipulation checks

In this experiment, assortment size, choice set complexity and time pressure were the manipulated variables. For assortment size, Cronbach's alpha (α =.697) (N=200)), which is high enough. For choice set complexity, Cronbach's alpha was (α =.719 (N=200)), which shows a good reliability. Lastly, the Cronbach's alpha for time pressure was (α =.676 (N=200)), which is an acceptable result. Therefore, all these items were computed into three single factors. Next, to check whether the manipulations were successful, three manipulation checks were performed, for every new single factor. For assortment size, there has been a significant difference between the high (M=5.21 SD=1.13) and the low (M=3.88 SD=1.21) assortment conditions $t(198) = 7.97$ p=.00 (<.05). Thus, the assortment size manipulation had proved to be successful. Further, the manipulation for choice set complexity has been successful, too. The results showed a significant difference between the perceived complexity, measured with the existence of a dominated option or not, in the high (M=3.91 SD=1.06) and low (M=4.96 SD=1.01) conditions $t(198) = 7.14$ p=.00 (<.05). This means that the respondents in the high complexity conditions, where all the options were relatively equally attractive, found the assortment less attractive and with no dominant option, than the respondents in the low complexity conditions, where there was a better option in the choice set. Finally, a manipulation check for time pressure was performed. There was a significant difference between the conditions with time pressure (M=4.70 SD=1.34) and those without time pressure (M=2.95 SD=1.05) $t(198) = 10.27$ p=.00 (<.05). All three manipulations have been successful.

4.1.2 Descriptive statistics and randomization checks

The final sample consisted of 200 respondents. These respondents were randomly and equally distributed over various conditions, in a between-subjects study design. Every condition had approximately 50 respondents, as previous research performed by Simmons et al (2013) acknowledged that this is the optimal number of observations per condition, as to ensure a

successful experiment. In this study, the number of respondents per condition varied from 46 to 54. For the complete SPSS output, see Appendix E.

The general sample of this experiment consisted of 123 females (61.5%), 72 males (36%) and 5 respondents (2.5%) who identified as other genders. Therefore, females were overrepresented in the experiment. However, across the conditions, the gender of the participants had an equal distribution, based on the Pearson's chi-squared test ($X^2(6)=7.115$, $p=.310 >0.05$). Most participants were between 22 and 26 years old. The age with the highest frequency was 24, which is 17% of the total sample. This makes sense, as the preferred method of survey distribution was convenience sampling, where people from researcher's network agreed to participate, which entailed other Master's students or graduates. Similar to the gender distribution, the age of the participants was equally distributed, as seen by the results of the Kruskal-Wallis test ($H(3)= 3.456$, $p=.326 >.05$). Based on the current residence, most participants lived in Romania (15.5%), United States (13.5%), United Kingdom (13.5%), Moldova (11.5%), The Netherlands (8.5%), and Ireland (5%). The participants were equally distributed across the conditions in the experiment ($X^2(108)=113.385$, $p=.342>.05$). In terms of education level, most respondents had a Bachelor's degree (41%), followed by a Master's degree (34.5%), Post-secondary education/college (14.5%), Secondary school (9.5%), and PhD (0,5%). Respondents' levels of education were equally distributed across the experimental conditions ($X^2(12)=10.359$, $p=.585>.05$).

4.2 Hypothesis Testing

The previous subchapter finalised the dataset and analysed the sample of 200 observations. After performing the manipulation checks, alongside with the descriptive statistics and randomization checks, the hypotheses have to be tested. In the following subsection, relevant data to perform hypotheses testing will be selected, and the outcome will be shown. To check the complete data output related to hypotheses testing, look into Appendix F.

4.2.1 Assortment size and choice deferral

This subchapter analyses whether assortment size is a valid predictor for choice deferral. This is meant to be the main effect (H1). Next, the moderating effect of choice complexity and time pressure are tested (H2, H3). These are meant to be two-way interaction effects. Finally, a three-

way interaction effect between time pressure, choice complexity and assortment size on deferral is tested (H4). First, data related to the independent variables is explored, to find out if there is a relationship between them and the dependent variable, deferral. Graphs and bar charts provide a visual representation of the dataset, which helps gain some insight into the results. Next, a binary logistic regression is performed to test all the hypotheses (H1, H2, H3, H4). The choice for selecting this particular statistical method is explained further, in the Assumptions testing subsection.

The bar chart in figure 2 shows how deferral is made based on two assortment size, low and high. There is little difference between the amount of deferral in low and high assortment sizes. In the high size condition, deferral was only slightly more frequent, than in the low condition (6.1% and 2%, respectively). Therefore, it can be implied that assortment size is not a significant predictor for choice deferral. This is further tested in the binary logistic regression.

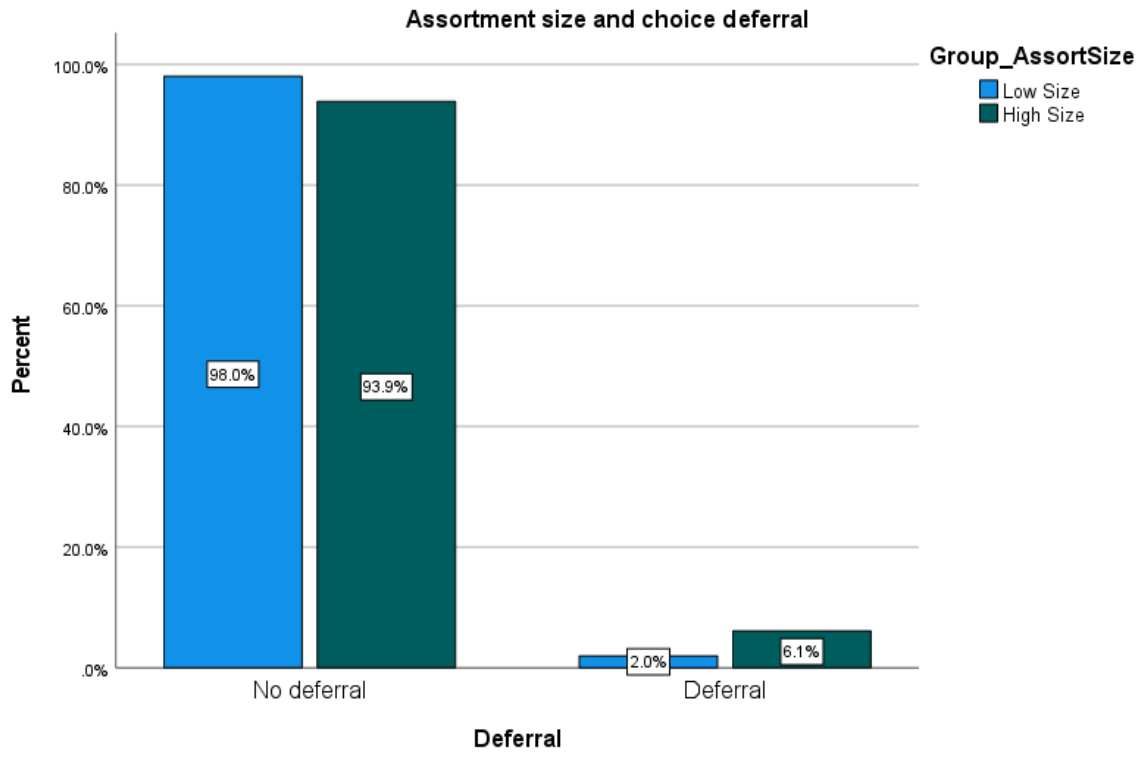

Figure 2: Bar chart assortment size and choice deferral

Next, the relationship between choice set complexity and deferral was examined. Similar to the previous results, the bar chart in figure 3 shows that there is not much difference between deferral rates in conditions with low and high complexity. A slightly higher deferral rate in the high complexity conditions, (6% compared to 2%) could signify that choice complexity is not a significant predictor for deferral.

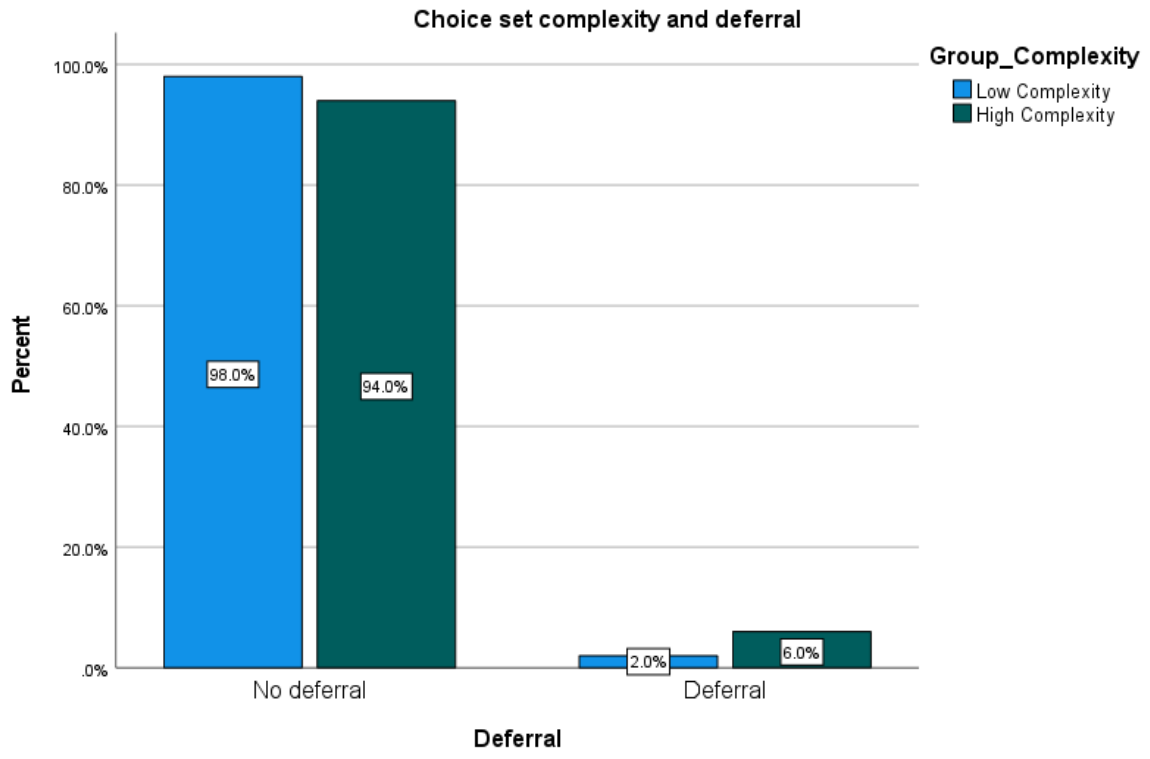

Figure 3: Bar chart choice set complexity and deferral

Finally, based on the third bar chart from this subsection, time pressure does not seem to be a significant predictor for choice deferral. In fact, the results are opposite from the H3, when there was no time pressure, no deferral was registered. In contrast, in the time pressure condition, deferral was registered (8.4%). This could be due to a highly pressured experiment condition, where participants only had 45 seconds to make their choice. This is further discussed in the last chapter.

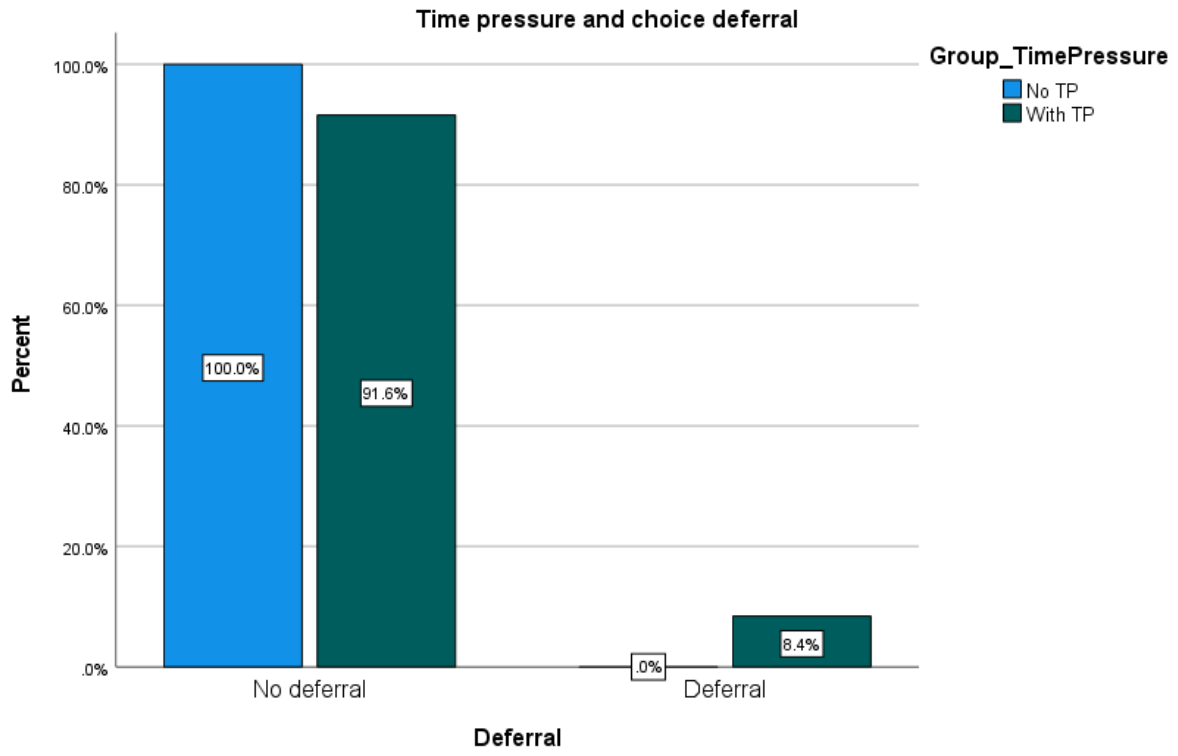

Figure 4: Bar chart time pressure and choice deferral

All these bar charts results point out towards the fact that there is no significant predictor for choice deferral, at least based on this experiment. This is further explored in the next part of the subchapter.

4.2.2.1 Assumptions testing

Choice deferral is the dependent variable, and it is measured binary. A binary variable can only take two values, 0 or 1, in this case, the decision can be either not deferred (0), or deferred (1). As this is a dichotomous variable, it is seen as a nominal and a categorical variable. This automatically excludes the possibility of performing ANOVA or linear regression tests. The only available statistical analysis method is binary logistic regression. A binary or binomial logistic regression is used to determine the impact of the independent variables, on the dependent dichotomous variable (Amstat, 2022). Although similar to linear regression, the logistic regression can only determine the probability of being set in one of the categories of the dependent variable (no deferral or deferral). Before performing a logistic regression, it has to be checked whether the dataset follows

the basic assumptions of the chosen statistical method. The first assumption is that the dependent variable is dichotomous. This is the case, as choice deferral is a nominal variable, with only two outcomes: the choice can be deferred or not deferred. The second assumption is that there is at least one independent variable, continuous or categorical. This condition is also met, in the dataset there are three main categorical variables (assortment size, complexity and time pressure), and six control variables, either categorical (preference uncertainty, gender, education, online shopping experience, place of residence), or continuous (age). The third assumption is that the observations are independent. This is the case, as the study is based on a between-subjects design. The forth assumption is that there are at least 15 cases per independent variables, however a number closer to 50 is recommended. This condition is met, as there are at least 45 cases per independent variable, and the sample size consists of 200 participants. The fifth assumption is that there is linearity of the continuous independent variables and their log-odds transformations. For every one-unit increase in age, the log-odds of deferral increases by a constant amount. To test this, the Box-Tidwell approach is used, where the interaction term between the continuous independent variable is added in the regression, in this case, age, to its natural log. To meet the linearity assumptions, the interaction term has to be insignificant ($p>0.05$). This is the case, $p=.689>.05$. See Appendix F, Table 1 for the output of this test. The sixth assumption is that there is no multicollinearity in the data. Multicollinearity is present when there is a high correlation between two or more independent variables (Amstat, 2022). This leads to issues when understanding which predictor is responsible for variance is the dependent variable. As it is not possible to check for multicollinearity in a logistic regression, a linear regression can be performed on the independent variables in the sample, alongside with a random continuous dependent variable. The rule of thumb used to confirm that there is no multicollinearity in the data is by obtaining a variance inflation factor (VIF) for the independent variables, lower than 10 (O'Brien, 2007). Based on the results, no variables are highly correlated with each other. Therefore, there is no multicollinearity. It is important to note than the place of residence as a control variable was not used in this test, as SPSS returns no output, suggesting that there are no valid cases found. Therefore, this control variable was also not used in the further logistic regression. The results of this test, where product knowledge was used as a random control variable, is available in Appendix F, Table 2. All the conditions to perform a binary logistic regression are met, therefore, it is possible to run the analysis.

First, the independent variables are added. These are assortment size, complexity, and time pressure. Next, the interactions between them are added: assortment size and complexity, assortment size and time pressure, and the three-way interaction: size, complexity and time pressure. Further, the control variables are added to the test: preference uncertainty, age, gender, education, online shopping experience. As two of the control variables are categorical (gender and education), they were recoded as dummy variables before running the logistic regression. It is important to note that while preference uncertainty and online shopping experience are ordinal variables, measured on a Likert scale, they were treated as continuous variables in the SPSS, for the ease of reading the output. The recoding of the variables can be found in Appendix F, Table 4. Finally, deferral has been added as the dependent variable. In the options tab, the Hosmer and Lemeshow tab has been checked off, to obtain more results regarding the goodness of fit, alongside with the 95% confidence interval.

4.2.2.2 Binary logistic regression results

After running the first binary logistic regression, the results can be interpreted. The complete output can be found in the Annex F, Table 5. Based on the "Omnibus test of model coefficients" which analyses the goodness-of-fit on a chi-square result, the result is not significant p=.068>.05. This means that Model 1 does not have a good fit. However, based on the Hosmer and Lemeshow test, the model shows a good fit, as in this case, the significance value had to be p>0.05, which was the case: p=.845> .05. Nevertheless, this test has been criticized by some statisticians, as high p-values are not always equal to a good model fit, rather that there is not enough evidence to imply that the model displays a poor fit (Glen, 2020). Based on the pseudo R-square results, found in the model summary, the Nagelkerke R-square is 0.393 This is an adjusted version of the Cox & Snell R-square, used to determine the variance of the dependent variable, in this case choice deferral, explained by the independent variables. In this case, 39.3% of the change in the choice deferral, can be accounted to the independent or predictor variables used in the model.

In the model 1, none of the independent variables have been statistically significantly supported. This is seen in the Variables in the Equation table, where all of the independent variables exceeded the significance level of p=0.05. This was a complete model, as it included all independent variables, with three interactions, and five control variables. There could be a possibility that a

simpler model, with no control variables, or interactions, would show a significant value. By using a model reduction technique, which deletes variables that are not statistically significant, the power of the test could be increased. Therefore, Model 1 will undergo a model reduction, first by deleting the control variables, then by deleting the interactions, while keeping the control variables, and finally, by performing a backward stepwise likelihood ratio selection.

4.2.2.3 Model reduction

In the previous subchapter, it was discussed that a simple model could increase the power of the test. In SPSS there are specific models of selection or elimination, where only the important variables are kept, to obtain a model that is easy to interpret. Two of these models are forward and backward stepwise selection. The forward selection starts with a null model, and adds a new significant variable step by step (Choueiry, 2022). It stops when there are no more significant variables in the dataset, in this case, when $p<.05$. The backward selection works in the opposite way, it starts with the complete model, and removes the least significant variable at each step. In this study, the backward selection method was chosen, because in this study there is a small amount of independent variables. The forward selection is advisable only when the number of variables is large, sometimes larger than the sample size. When the backward elimination was used on the 1st model, the interaction effect of assortment size and time pressure was removed in the 1st step. In the 2nd step, the three-way interaction between size, time pressure and complexity was removed. Next, control variables such as online shopping experience were removed. Therefore, the next models will test the effect of assortment size on deferral, by deleting the control variables in the 2nd model, and then by deleting the interaction effects.

Model 2 includes the main effect of assortment size on deferral, alongside with interaction effects (Appendix F, Table 6). Here, control variables were deleted, to help increase the preciseness of the test. The Chi-square test showed a significant result, $p=.005<.05$, and the Hosmer and Lemeshow test an insignificant result $p=1>.05$, which improved the goodness-of-fit, compared to Model 1. The pseudo R-square was 0.308. However, none of the variables had a significant effect on the dependent variable. Therefore, a new model has to be tested.

Model 3 contains only the main effect of size on deferral (Appendix F, Table 7). The three interaction effects (size on complexity, size on time pressure, and size on time pressure and on complexity) have been deleted. Instead, control variables were added again. This is in line with the results of the backward elimination, where interaction effects were the first deleted variables. While the results of the goodness-of-fit were acceptable, the Chi-square test showed a significant result where $p=.031<.05$, and the Hosmer and Lemeshow had an opposite insignificant result $p=.808>.05$, none of the variables were statistically significant. Finally, Model 3 had to be simplified. As none of the variables proved to be significant predictors for choice deferral, the SPSS method of backward elimination could be implemented. It helps eliminate the weakest contributors of the model, and leaves only the significant variables. After running the backward elimination tool on the model 3, all variables were removed up until de 12^{th} step. This further proves the results of the bar charts, that the alternative hypotheses cannot be supported.

4.2.3 Effect of time spent on products page and deferral

To test if there is a significant difference on deferral rates based on the time users spent on the products page, a Kruskal-Wallis H test was conducted. This statistical procedure tests if there is significant difference between the two groups of users who deferred or did not defer the choice based on the amount of time spent. As this is a nonparametric test, also known as "one-way ANOVA on ranks", it doesn't need to respect the original ANOVA assumption of normality of data (Laerd Statistics, 2022). This is also the reason why ANOVA was not a suitable method, because the collected data on time spent in the experiment was not normally distributed. To check the histogram of time spent on products page, see the Appendix G, Figure 1. Before conducting the analysis, the assumptions of Kruskal-Wallis H test have to be met. Fist, the dependent variables has to be either ordinal or continuous. This is the case, as the time spent is a continuous/scale variable. Second, the dependent variable consists of at least two categorical groups. This is also true; deferral is a nominal variable which has two groups (no deferral; deferral). Third, observations should be independent (Laerd Statistics, 2022). This is also the case, as this was a between-subjects research design. Therefore, all the conditions for the Kruskal-Wallis H test are confirmed. The results, however, were not statistically significant, $H(1)= 0.002$ $p=.963>.05$, which means that there is not a significant difference on deferral rates based on the time spent on the products page.

Table 3: Binary logistic regression models

	Mod 1		**Mod 2**		**Mod 3**	
	B	***S.E***	***B***	***S.E***	***B***	***S.E***
AssortSize	34.592	18432.664	34.451	18730.895	1.224	.938
Complexity	34.757	9543.717	35.300	10027.055	1.511	.937
TimePressure	15.322	15607.947	15.355	15991.954	19.020	3646.015
Int1	-19.686	14504.143	-19.446	14695.317		
Int2	-.060	7884.791	.474	7910.507		
Int3	1.421	6848.349	1.046	6906.819		
Age	-.085	.078			-.089	.078
Gender						
Gender 1	-.454	.829			-.421	.834
Gender 2	-.457	16916.683			.180	16665.137
Education						
Education 1	19.225	7598.855			19.613	7617.337
Education 2	17.980	7598.855			18.224	7617.337
Education 3	18.796	7598.855			19.021	7617.337
Education 4	21.302	42700.552			19.607	41070.574
Online shopping experience	.130	.327			.111	.320
Preference uncertainty	-.370	.329			-.395	.336
Constant	-117.965	37369.863	-104.354	37750.960	-59.566	10545.023
N	200		200		200	
Nagelkerke	39.3%		30.8%		37.5%	
Hosmer & L	0.845		1.000		0.808	

Int1: Assortment Size x Complexity
Int2: Assortment Size x Time Pressure
Int3: Assortment Size x Complexity x Time Pressure

4.2.4 Hypotheses analyses

Hypothesis 1 predicted that assortment size is positively related to choice deferral, and that a higher assortment size could lead to more deferral, than a lower assortment size. Because the model 1 does not fit the data well, the final result from model 4 was chosen for interpretation. Nevertheless, the result shows no significant relationship between assortment size and deferral (*B*=1.224, *SE*=.938 *p*=.192>.05). This means that the hypothesis is rejected.

Hypothesis 2 predicted that a high complexity increases the relationship between assortment size and deferral, while a low complexity weakens the effect. As the model 1 does not fit the data, and the interaction effects are not present in the model 3, and model 4, the results from the model 2 were chosen for interpretation. The tested effect was assortment size x complexity. The result was not significant (*B*=-19.446 *SE*=14695.317 *p*=.999>.05). Therefore, this hypothesis is rejected.

Hypothesis 3 predicted that time pressure weakens the relationship between assortment size and deferral. Just like the hypothesis 2, the model 2 was chosen to analyse the results. The two-way interaction between assortment size and time pressure is not significant (*B*=.474 *SE*=7910.507 *p*=1>.05). This hypothesis is rejected.

Hypothesis 4 predicted that time pressure weakens the relationship between size and deferral when complexity is high, while it has no significant difference when there is low complexity. The model 2 was chosen for the analysis of the hypothesis, just like the previous two cases. This three-way interaction was not significant (*B*=1.046 *SE*=6906.819 *p*=1>.05). This hypothesis is rejected.

4.2.5 Overview of the results

Based on the previous analyses, none of the hypotheses have been supported. Table 5 shows an overview of the results.

Table 4: Overview of the results

Hypotheses	**Supported/Not supported**
H1 Consumers choosing from a large assortment size are more likely to defer their choice, than consumers choosing from a small assortment size.	Not supported
H2 Relatively equally attractive options in the choice set increase the likelihood of choice deferral, while a dominant option in the choice set decreases the likelihood of choice deferral.	Not supported
H3 Under high time pressure, consumers who choose from a large assortment size, are less likely to defer their choice, than consumers who choose under low time pressure.	Not supported
H4 Under high time pressure, consumers are less likely to defer their choices, when choosing between equally attractive choice options, while a dominant option in the choice set has no significant difference in the time pressure effect on choice deferral.	Not supported

Chapter 5: Discussion

This research investigated the relationship between assortment size and choice deferral. Additionally, it focused on the effect of choice set complexity and time pressure, which were found by prior research to have an impact on choice overload (Chernev et al., 2015; Dhar & Nowlis, 1999). In the experiment, three main variables discussed above were manipulated, alongside with their interactions, and other control variables. This section analyses the results, with a special focus on academic and managerial implications, research limitations and directions for future studies.

5.1 Main findings and results

Many academics suggested that assortment size is linked to choice deferral. Specifically, a high assortment and a lot of choice could lead to a lower purchase rate, as consumers prefer to defer their choice to a later time, or make no decision at all. This idea was made popular by authors like Schwartz (2004), who developed the concept of "paradox of choice". Business owners of consumer goods were advised to keep a lower product assortment, as to avoid the phenomenon of choice deferral. While there are similarities between this research and prior research, in regards to focusing on a product, instead of services, most studies carried over experiments in physical stores. A famous study that comes to mind is an experiment with various jams, where even though more participants were attracted to the variety provided by the large assortment, three times more of them chose to buy from the small assortment (Iyengar & Lepper, 2000). However, other experiments could not find evidence of choice overload. Surprisingly, an experiment in a German restaurant in Berlin, found that participants were equally likely to choose a coupon from a small or a large choice set (Scheibehenne et al., 2009). This could have been due to cultural differences between American and German participants. In contrast, the experiment in this study was carried in an online environment. The goal was to find out whether choice deferral was registered on a similar rate, compared to physical stores. The results from the binary logistic regression found no significant effects for assortment size on deferral. On a similar note, no significant effects were found for any of the manipulated variables. Therefore, the proposed hypotheses did not receive sufficient support, and the null hypotheses were not rejected.

An interesting finding was that the manipulation check for assortment size was successful, as the t-test indicated a significant difference between the means. Respondents in the high assortment condition, perceived the choice set as much higher than those in the low assortment condition. This means that the choice of 4 products for the low assortment, and 16 for the high assortment was acceptable. However, this did not mean that participants preferred to defer, when faced with the large assortment. In contrast, the size of the assortment could have not been seen as an impediment. This idea only remains on the theoretical ground, as the statistical result proved to be insignificant. Therefore, it cannot be inferred that the opposite is true.

Choice complexity was previously studied in academic literature, as shown in previous chapters. As an extrinsic and context factor, a high degree of complexity was linked to deferral. This factor is complex in itself. It has multiple facets, such as the presence of a dominant option, the attractiveness of options, alignability, and feature complementarity. Previously, researchers focused on a single factor of complexity. This paper was similar in this regard, as it compared conditions with a dominant option, defined as a relatively better option, with conditions where no option is dominant. The novelty in this experiment was a larger set of options, as in the past dominated or relatively equally options were compared in a set of two products (Dhar, 1997; Tversky & Shafir, 1992). This was a necessary step, because complexity served as a moderator between size and deferral, instead of an independent variable with a main effect. In this research, complexity was measured through an interaction effect between assortment size and complexity. The results were not statistically significant, and it cannot be supported that high complexity leads to more deferral, than less complexity. Similar to the main effect, in the manipulation check respondents perceived the conditions they were in as intended by the study. However, most of them still chose a product, even though the condition was perceived as high in complexity. As previous research studied dominated and non-dominated conditions in a small set of two, it is possible that this complexity factor is not significant for larger assortments, with more than two options. It is harder to compare between multiple products, and the differences might not be as visible as compared to only one additional alternative, especially in the condition with 16 options. It is suggested to continue studying this complexity factor in future research.

Time pressure was extensively studied in the past. It was said to have an effect on deferral. The findings are diverse: while some researchers found it reduce deferral, others pointed out that it

leads to more deferral, or a negative reaction to risk-taking behaviour, specifically in interaction with the emotional state of the respondent (Hu et al., 2014). Nowadays, consumers have to make decisions quickly. This factor is especially present in the online environment, like e-commerce stores. Companies know that limited edition products, and seasonal sales could boost conversion rates (Abraham & Lodish, 2014). This is one of the ways time pressure is applied. However, while limited time could serve as an incentive to purchase a product, when there too much time pressure, it could have an opposite effect. In this experiment, this moderator was measured through an interaction effect between time pressure and assortment size. As a result, no significance was found. Nevertheless, in conditions with no time pressure, all respondents chose a pair of headphones. In conditions where time pressure was applied, some consumers deferred their choice, particularly in the large assortment sets. While this is still an insignificant result, it could be seen that a high degree of time pressure could actually lead to more deferral. In future research, it would be helpful to add conditions with different degrees of time pressure, as to see if there is a difference between a medium time pressure and high time pressure.

The last hypothesis studied a three-way interaction between assortment size, complexity and time pressure. The idea was that time pressure weakens the effect of high complexity conditions, but it makes no difference on the low complexity conditions. This was inspired by previous research in choice sets with dominated products, under the effect of time pressure (Dhar, 1997). Still, no significant effect was found. This means that the null hypothesis, that there is no difference between conditions with high and low complexity under the effect of time pressure, cannot be rejected. Similar to the complexity condition, this effect was studied in a very low number of academic papers. Moreover, assortment size was not included as an independent variable, as the research was focused solely on the complexity and deferral between two products, with the addition of time pressure. Therefore, it could be possible that the effect does not apply to larger assortment sizes. More research should investigate this phenomenon.

The experimental design could have also affected the results and the deferral rates. It is believed that true and valid experiments composed out of four factors: manipulation, control, random assignment and random selection (HHS, 2022). In this experiment, three variables were manipulated: assortment size, complexity and time pressure. It remains a possibility that conducting a new experiment with a higher difference in assortment sizes, at least 24 or 32 options

for the large assortment, for example, could have led to a different outcome. Similarly, for complexity, using fictional products, where one item is a clearly better choice from all standpoints (best qualities, best aesthetic design, low price) in the low complexity, and equally average to low-quality items in the high complexity. In regards to time pressure, using multiple time limits, from no limit, to low, medium and high, could have shown different deferral rates. While there were 5 control variables, more factors such as current user emotion could have influenced the deferral proportions. Lastly, while an option for random assignment of conditions was used in the Qualtrics software, there was no random selection of participants, due to low resources to use random sampling. It is important to note that this was a fictitious scenario, where users did not feel like they were actually making a real purchase from an actual website, which could have had an effect on the low deferral rates.

5.2 Academic implications

This paper contributes to research in consumer marketing in an online environment, particularly e-commerce. The product of choice was headphones, an electronics product, of increased popularity within the current generation, as it was shown to be the most purchased tech good during the lockdown (Mathivanan, 2021). While previous research in the choice overload literature also focused on some electronic goods, alongside with other FMCG such as toothpaste, jam, and chocolate, none of the available research focused on headphones. In contrast to other studies, the chosen products were all real, as they were picked from current available headphones sets on popular e-commerce websites like Bol and Amazon. Additionally, the experimental environment was online, as opposed to previous studies, where physical stores were the chosen arena. Regarding the variables manipulations, choice complexity was analysed in a small and large assortment, which previously was limited to maximum two products. It is important to note that choice complexity through the dominated option factor is seldom encountered in literature. Most researchers focused on other choice overload factors, such as preference uncertainty. The other moderator, time pressure, was increased to a higher level, while previous research had an average of 1.30-minute time limit for a comparatively similar choice set, in this experiment respondents had only 45 seconds to make their decision. Still, none of the hypotheses were significant. These results mean that they are insufficient to deliver clear findings about the relationship between assortment size and deferral, and the previously discussed moderators. This might be due to the

limitations of the current research. It is necessary that more research focuses on studying these effects.

5.3 Managerial implications

Choice deferral is currently a hot topic for e-commerce owners and marketing managers. In the sales funnel, only an average of 3% of leads end up purchasing the product, which is a quite low rate (Chappal, 2021). In the consumer electronics goods, the conversion rate is only 1.4%, the lowest out of other 10 product types. Headphones are also a tech product, which are known for their complexity and high involvement rate, compared to other simpler products, such as a box of chocolates or a bag of rice. It takes more cognitive effort to choose a pair of headphones, as it comes along with complex technical attributes. At the same time, these products are not exactly cheap, compared to the aforementioned FMCG. Though, deferral, or the choice not to choose, is a difficult factor. There could be tens of other moderators and mediators influencing it. The key is to figure which factors influence deferral rate, and minimize it, while improving conversion rates. Based on this research, no hypotheses were supported, therefore, it is challenging to provide clear managerial advice. Nevertheless, an interesting factor remains time pressure. While in the pre-test it was limited to 1.30-minute, and the manipulation check proved to be insignificant, which means that respondents did not perceive the high pressured conditions as such, in the final analysis it was reduced to half the time, 45 seconds. Even though the main result was insignificant, the fact that no participants deferred in the conditions with no time limit, while some deferred in the high time pressure conditions, this could mean than offering too little time also results in deferral. Marketers should address this factor when setting up promotional campaigns and limited-time offers.

5.4 Research limitations

The results of this research have to be considered while taking into account its limitations. There were several limitations, which could have had a great impact on the outcome of the experiment. First, it is useful to look into the chosen method and experimental environment. The online environment was not realistic enough, as it did not look like a usual e-commerce store. Even though the products were real, with their actual attributes and pictures, the general look of the experiment lacked realism. The Qualtrics software, while useful for market research and academic

experiments, has limited tools to build an actual shopping experience in an online environment. Building a realistic e-commerce prototype, similar to Amazon or Bol would have been a very challenging task, given the lack of web development skills and time. Next, it would have been a good idea to carry one more similar experiment, but in an actual physical store. This would have helped to compare the results. However, a physical experiment would have taken too many resources, and this is primarily the reason an online experiment was preferred. The questionnaire method, while appreciated for its efficiency and budget-friendly status, has its own issues. When completing a survey, respondents might not be honest, choosing the answers they think are in line with the research topic, might not fully understand the questions, especially if the survey is written in a foreign language. Additionally, if the survey is too long, which would be useful for the researcher, as it increases the power of the test, respondents could suffer from survey fatigue. Many of them might not even complete the whole survey.

Choice deferral is a complex topic. When a decision is deferred, it could lead to postponing the choice, or refusing to make a choice in general. The study would have provided more results, if the experiment was carried out on a longer-time frame. This means that the same respondent agrees to partake in an experiment with at least one more step, where they get to make their choice between different headphone sets a month later, for example. This would have offered a new perspective on whether choosing at a later time might come with different results. This method was not chosen because of the limited time resources and finding enough respondents to be willing to participate in such a study. As deferral is not an easy decision, it comes to mind what truly influences it. This study only took into account assortment size, choice complexity and time pressure, to help build a simple experiment, with a sample size of around 200 participants. There are countless other factors which could be influencing the decision not to choose. Personality type, current emotions and desires, choice difficulty, product involvement and lack of knowledge related to product type, are only a few of possible antecedents to choice deferral.

The manipulated variables also encountered a set of issues. In regards to choice complexity, it would have been easier to help participants distinguish between a dominant and a non-dominant product, by showing the brand name. However, brand names were changed to fictional names, as not to participate in a bias. In this study, branding was also not a manipulated variable, so it was decided to make a compromise between realism of the experiment and participant bias. Also, it is

not known whether participants made their choices by taking into account all of the attributes. It could have been possible that some of them made the decision solely by the visual representation of said products, instead of carefully examining their technical aspects. At the same time, not including the picture of the product would not have been a good idea, as it does not resemble a real shopping experience. Probably that it would have been necessary to include additional questions to control for main attribute selection technique, to get some insight into what helped participants make their choice. Time pressure was the second manipulated moderator. Here, the issue stems to whether time pressure was too high, which led some participants defer their choice, even though in an insignificant effect. A higher time pressure was meant to counteract the effect of the pre-test results, where participants in the limited time conditions did not perceive them as such. Here, it would have been helpful to include an additional condition, with a moderate time pressure, to see whether there are differences in the outcomes. This was not included in the current research, because it would have complicated the study too much, where an increased number of participants would have been needed.

Based on the sample size distribution, most respondents were students or recent graduates under 26 years old. This does not represent the whole population. These respondents were raised in a digital era, and they were most probably used to online shopping. This could have led them to quickly look through the products and attributes, and make their choice. In contrast, online shopping novices could have had a harder time to grasp the product differences and select a favorite item. This was also shown in prior research (Chen et al., 2009). Many respondents found out about the survey via Facebook survey groups. There, students share their surveys, and in exchange, they complete other people's surveys. While this is a fast and reliable method to collect responses in a timely manner, here students are used to answering questionnaires. Many of them might have similar research topics themselves, which could lead to biased answers. The good result was that the sample size was diverse, in regards to the place of residence. Many respondents were from different countries, which made a good addition to the variety of distribution in the descriptive statistics.

5.5 Ideas for future research

Limitations always provide more opportunities. This is also the case with the current limitations in this paper, which could bring new ideas to develop in future studies. First, new research could take the time and resources to build a website similar to other popular e-commerce stores. This would improve the realism of the experiment, and possibly the outcomes of the study. Additionally, it would be interesting to set up two experiments, one in a simulated online store, and another in a physical store. Afterwards, the results could be compared to see if there is a difference in deferral rates. The questionnaire could be swapped to a different data collection method, such as observation or social media monitoring (Cote, 2021). Here, the researcher observes how the user interacts with the website, for example how the user goes through the sales funnel, and what stops them to reach conversion. In the later method, it tracks social media channels to find out how the audience interacts with the page. Here, it could provide new insights into what leads the user to spend time on the shopping page. In contrast to questionnaires and other self-report methods, these methods are immune to subject bias, as users are not afraid to make the choice based on their own desires.

New research could carry a more complex experiment, on a long-term duration. They could do so by selecting a sample, and making the participants engage in an experiment divided in multiple steps. The same products would be shown to those who initially deferred, a month or year later. The results would be then compared. It would be also useful to analyse other deferral factors, such as the influence of personality types and emotions, in relation to not making a choice. More research is necessary to develop a powerful statistical test, where variables like complexity and time pressure are successfully manipulated. Other studies could examine how the user makes their decision in regards to attributes. Additional questions related to the main attributes which influence the final choice are needed, as a control variable. Time pressure could be manipulated in a set of multiple conditions, such as no time pressure, low time pressure, moderate time pressure and high time pressure. It would help figure out if the degree of limited time influences the outcome. Finally, a more representative sample is necessary to build correct conclusions about what leads or doesn’t lead to choice deferral. A diverse sample, with people of different ages, could help researchers generalize their findings to a population level. At the same time, a replication of the study to multiple generations would help analyse if similar results of deferral are found.

References

Abraham, M., & Lodish, L. M. (2014). Getting the most out of advertising and promotion. Harvard Business Review. Retrieved September 28, 2022, from https://hbr.org/1990/05/getting-the-most-out-of-advertising-and-promotion

Allen, M. (2017). The SAGE Encyclopedia of Communication Research Methods. Sage Inc.

Amstat, A. (2022) Binomial logistic regression - statistical consulting: AMSTAT consulting. Binomial Logistic Regression. Retrieved September 26, 2022, from https://www.amstatisticalconsulting.com/binomial-logistic-regression/

Anderson, Chris. (2006). The Long Tail: Why the Future of Business Is Selling Less of More, New York: Hyperion.

Anderson, Christopher J. (2003). The Psychology of Doing Nothing: Forms of Decision Avoidance Result from Reason and Emotion. *Psychological Bulletin*, 129 (1), 139–66.

Anderson, Lee K., James T. Taylor, & Robert J. Holloway. (1966). The Consumer and His Alternatives: An Experimental Approach. *Journal of Marketing Research*, 3 (1), 62–67.

Bell, David E. (1982). Regret in Decision Making under Uncertainty. *Operations Research*, 30 (5), 961–81.

Berger, Jonah, Michaela Draganska, & Itamar Simonson. (2007). The Influence of Product Variety on Brand Perception and Choice. *Marketing Science*, 26 (4), 460–72.

Bowling, A. (2005). Just one question: If one question works, why ask several? *Journal of Epidemiology & Community Health*. Retrieved September 26, 2022, from https://jech.bmj.com/content/59/5/342

Camerer, C. F., & Hogarth, R. M. (1999). The Effects of Financial Incentives in Experiments: A Review and Capital-Labor-Production Framework. *Journal of Risk and Uncertainty*, 19, 7–42. https://link.springer.com/article/10.1023/A:1007850605129

Chappal, M. S. (2021). What's a good funnel conversion rate?. Databox. Retrieved September 28, 2022, from https://databox.com/improve-your-funnel-conversion-rate

Chen, Y.-C., Shang, R.-A., & Kao, C.-Y. (2009). The effects of information overload on consumers' subjective state towards buying decision in the internet shopping environment. *Electronic Commerce Research and Applications*, 8(1), 48–58. https://doi.org/10.1016/j.elerap.2008.09.001

Chernev, A. (2005). Feature Complementarity and Assortment in Choice. *Journal of Consumer Research*, 31 (4), 748–59

Chernev, A., Böckenholt, U., & Goodman, J. (2015). Choice overload: A conceptual review and meta-analysis. *Journal of Consumer Psychology*, 25(2), 333-358 https://doi.org/10.1016/j.jcps.2014.08.002.

Chernev, Alexander, & Hamilton, Ryan (2009). Assortment size and option attractiveness in consumer choice among retailers. *Journal of Marketing Research*, 46 (June), 410 –420

Cho, C.-H., Kang, J., & Cheon, H. J. (2006). Online shopping hesitation. *CyberPsychology & Behavior*, 9,261–274.http://dx.doi.org/10.1089/cpb.2006.9.261

Choueiry, G. (2022). Understand Forward and Backward Stepwise Regression. Quantifying Health. Retrieved September 26, 2022, from https://quantifyinghealth.com/stepwise-selection/

Comegys, C., & Brennan, M. L. (2003). Students' Online Shopping Behavior: A Dual-Country Perspective. *Journal of Internet Commerce*, 2(2). https://doi-org.eur.idm.oclc.org/10.1300/J179v02n02_05

Cote, C. (2021). 7 data collection methods in Business Analytics. Business Insights. Retrieved September 28, 2022, from https://online.hbs.edu/blog/post/data-collection-methods

Cozby, P. C., & Bates, S. C. (2014). Methods in Behavioral Research, 12th edition. McGraw Hill: New York, NY

Creswell, J. W., & Creswell, J. D. (2017). Research Design. Qualitative, Quantitative, and Mixed Methods Approaches (5th ed.). Sage Inc.

Dhar, Ravi & Nowlis, Stephen, M. (1999). The Effect of Time Pressure on Consumer Choice Deferral. *Journal of Consumer Research*, Volume 25, Issue 4, 369–384, https://doi.org/10.1086/209545

Dhar, Ravi. (1997). Consumer Preference for a No-Choice Option. *Journal of Consumer Research*, 24 (September), 215-231.

Dhar, Ravi. (1997). Context and Task Effects on Choice Deferral. *Marketing Letters*, 8(1), 119–130. http://www.jstor.org/stable/40216436

Glen, S. (2020, December). Hosmer-Lemeshow test: Definition. Statistics How To. Retrieved September 26, 2022, from https://www.statisticshowto.com/hosmer-lemeshow-test/

Godinho, S., Prada, M., & Garrido, M. V. (2016). Under Pressure: An Integrative Perspective of Time Pressure Impact on Consumer Decision-Making. *Journal of International Consumer Marketing*, 28(4), 251–273. doi: 10.1080/08961530.2016.1148654

Goforth, C. (2015). Using and Interpreting Cronbach's Alpha. Research Data Services + Sciences. Retrieved September 26, 2022, from https://data.library.virginia.edu/using-and-interpreting-cronbachs-alpha/

Gourville, John T., & Soman, Dilip. (2005). Overchoice and assortment type: When and why variety backfires. *Marketing Science*, 24(Summer), 382–395.

Hao, Y. Y., Ye, Q., Li, Y. J., and Cheng, Z. (2010). How does the valence of online consumer reviews matter in consumer decision-making? Differences between search goods and experience goods. Proceedings of the 2010 43rd Hawaii International Conference on System sciences, 1–10.

Heitmann, M., Herrmann, A., & Kaiser, C. (2007). The effect of product variety on purchase probability. *Review of Managerial Science*, 1, 111–131. http://dx.doi.org/10.1007/s11846-007-0006-6

HHS. (2022). Module 2: Research Design - Section 2: Experimental Studies. The office of research integrity. Retrieved October 4, 2022, from https://ori.hhs.gov/module-2-research-design-section-2

Hu, Y., Wang, D., Pang, K., Xu, G., & Guo, J. (2014). The effect of emotion and time pressure on risk decision-making. *Journal of Risk Research*, *18*(5), 637–650. https://doi.org/10.1080/13669877.2014.910688

Huber, Joel, Payne, John W., & Puto, Christopher (1982). Adding asymmetrically dominated alternatives: Violations of regularity and the similarity hypothesis. *Journal of Consumer Research*, 9 (June), 90–98.

Hutchinson, John M. C. (2005). Is More Choice Always Desirable? Evidence and Arguments from Leks, Food Selection, and Environmental Enrichment," *Biological Reviews,* 80 (1), 73–92.

Inbar, Yoel, Karlene Hanko, Simona Botti, & Tom Gilovich. (2008). When Is Too Much Choice Too Much to Handle?. Annual meeting of the Society for Personality and Social Psychology, Albuquerque, NM.

Iyengar, Sheena S. & Mark R. Lepper. (2000). When Choice Is Demotivating: Can One Desire Too Much of a Good Thing? *Journal of Personality and Social Psychology*, 79 (6), 995–1006.

Laerd Statistics, L. (2022). Kruskal-Wallis H test using SPSS statistics. Kruskal-Wallis H Test in SPSS Statistics. Retrieved October 4, 2022, from https://statistics.laerd.com/spss-tutorials/kruskal-wallis-h-test-using-spss-statistics.php

Malhotra, N.K. & Birks, D.F. (2007). Marketing Research: An Applied Approach. Pearson Education Limited, London, UK

Mathivanan, S. (2021). Headphones were the most purchased Tech product during lockdown. Market research, data, reports, marketing insights and analytics, forecasts and intelligence covering a range of technology industries. Also consumers' surveys, custom consulting and events. Retrieved September 28, 2022, from https://www.futuresource-

consulting.com/insights/headphones-were-the-most-purchased-tech-product-during-lockdown/?locale=en

McShane, B. B., & Böckenholt, U. (2018). Multilevel multivariate meta-analysis with application to choice overload. *Psychometrika*, 83(1), 255–271. https://doi.org/10.1007/s11336-017-9571-z

Mogilner, Cassie, Tamar Rudnick, & Sheena S. Iyengar. (2008). The Mere Categorization Effect: How the Presence of Categories Increases Choosers' Perceptions of Assortment Variety and Outcome Satisfaction. *Journal of Consumer Research*, 35 (2), 202–15.

Nagar, Komal & Gandotra, Payal. (2016). Exploring Choice Overload, Internet Shopping Anxiety, Variety Seeking and Online Shopping Adoption Relationship: Evidence from Online Fashion Stores. *Global Business Review*. 17. 10.1177/0972150916645682.

O'Brien, R. M. (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity, 41*, 673–690. https://doi.org/10.1007/s11135-006-9018-6

Payne, John W., James R. Bettman, & Eric J. Johnson. (1993). The Adaptive Decision Maker: Effort and Accuracy in Choice, Cambridge: Cambridge University Press

Pethtel, O. L., & Chen, Y. (2013). Age Differences in Choice Deferrals as Functions of Interattribute Conflict and Decision Domain. *Educational Gerontology*, 39(10), 772–782. https://doi.org/10.1080/03601277.2013.798215

Pirlympou, Z. (2017). A critical study: How gender determines consumer preferences. *Journal of Economics and Business*, XX (2). https://www.u-picardie.fr/eastwest/fichiers/art214.pdf

Scheibehenne, B., Greifeneder, R., & Todd, P. M. (2009). What moderates the too-much-choice effect? *Psychology and Marketing*, *26*(3), 229–253. https://doi.org/10.1002/mar.20271

Scheibehenne, B., Greifeneder, R., & Todd, P. M. (2010). Can there ever be too many options? A meta-analytic review of choice overload. *Journal of Consumer Research*, 37(3), 409–425.

Schwartz, B. (2000). Self-Determination: The Tyranny of Freedom. American Psychologist, 55 (1), 79–88.

Schwartz, B. (2004). The paradox of choice: Why more is less. New York: Ecco

Sheatsley, P.B., (1983). "Questionnaire Construction and Item Writing." In Rossi, P.H., Wright, J.D., Anderson, A.B. (eds.) Handbook of Survey Research, chapter 6. Academic Press, Inc.: San Diego, CA.

Simmons, J. P., Nelson, L. D., Simonsohn, Uri, (2013). Life after P-Hacking Meeting of the Society for Personality and Social Psychology, New Orleans, LA.

Sudman, S., (1983). "Applied Sampling." In Rossi, P.H., Wright, J.D., Anderson, A.B. (eds.) Handbook of Survey Research, chapter 5. Academic Press, Inc.: San Diego, CA.

Tversky, Amos, & Shafir, Eldar. (1992). Choice under conflict: The dynamics of deferred decision. *Psychological Science*, 3(6), 358–361.

Wei HL, Hai CY, Zhu SY, & Lyu B. (2021). The Impact of Consumers' Choice Deferral Behavior on Their Intertemporal Choice Preference. *Front Psychol.* doi: 10.3389/fpsyg.2021.555150

White, C. M., Hoffrage, U., & Reisen, N. (2015). Choice deferral can arise from absolute evaluations or relative comparisons. *Journal of experimental psychology*: Applied, 21(2), 140–157. https://doi.org/10.1037/xap0000043

Zeelenberg, Marcel, Wilco W. van Dijk, Antony S. R. Manstead, & Joop van der Pligt. (2000). On Bad Decisions and Disconfirmed Expectancies: The Psychology of Regret and Disappointment. *Cognition and Emotion*, 14 (4), 521–41.

Appendices

Appendix A: Measurement variables

Appendix B: Pre-test results

Appendix C: Survey design

Appendix D: Manipulation and reliability analyses

Appendix E: Descriptive statistics

Appendix A: Measurement variables

Table 1: Measurement variables

Variable	Item	Source
Assortment size	1.How do you evaluate the options available? 2.There were too many options in the choice set 3.There were enough options in the choice set	Godinho et al. (2016) Iyengar & Lepper (2000)
Choice set complexity	1.Please rate the attractiveness of the presented products 2.The assortment was attractive 3.There was a relatively more attractive option in the choice set, compared to others	Li et al. (2017)
Time pressure	1.How pressured did you feel when making your choice? 2.How fast did you need to make your decision? 3.I had enough time to make my decision	Dhar & Nowlis (1999) Godinho et al. (2016)
Online shopping experience	1.I am experienced in online shopping	Chen et al. (2009)
Preference uncertainty	1.I am knowledgeable about this product 2.Some headphones features were more important for me, than others 3.I was trying to find the best deal	Hao et al. (2010)
Realism of the experimental scenario	1.How likely would you be to encounter such products in a real-life scenario? 2.How likely would you be to do the things described in the scenario?	Godinho et al. (2016)

Appendix B: Pre-test results

Table 1: Independent samples T-test for assortment size

Group Statistics

	Group_Assort Size	N	Mean	Std. Deviation	Std. Error Mean
Size	High Size	11	5.3333	1.00000	.30151
	Low Size	14	3.8095	1.21750	.32539

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Assortment_Size	Equal variances assumed	.435	.516	3.353	23	.001	.003	1.52381	.45452	.58356	2.46406
	Equal variances not assumed			3.435	22.931	.001	.002	1.52381	.44361	.60599	2.44163

Table 2: Independent samples T-test for choice set complexity

Group Statistics

	Group_Complex	N	Mean	Std. Deviation	Std. Error Mean
Complex	High	11	3.0606	.51247	.15452
	Low	14	5.7619	.49663	.13273

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Complexity	Equal variances assumed	.007	.934	-13.314	23	<.001	<.001	-2.70130	.20290	-3.12102	-2.28157
	Equal variances not assumed			-13.261	21.287	<.001	<.001	-2.70130	.20370	-3.12456	-2.27804

Table 3: Independent samples T-test for time pressure

Group Statistics

	Group_TimePressure	N	Mean	Std. Deviation	Std. Error Mean
Time_Pressure	With time pressure	12	3.0833	1.75882	.50773
	No time pressure	13	2.6923	1.15037	.31906

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Time_Pressure	Equal variances assumed	8.145	.009	.663	23	.257	.514	.39103	.58970	-.82886	1.61091
	Equal variances not assumed			.652	18.726	.261	.522	.39103	.59965	-.86531	1.64736

Table 4: Pre-test reliability analyses

Variable	**Cronbach alpha**	**N**
Assortment size	0.737	25
Choice set complexity	0.969	25
Time pressure	0.918	25

Appendix C: Survey design

Dear participant,

Thank you for your interest in taking part in this experiment.

The study you are participating in was designed by a Master's student from the Erasmus University of Rotterdam, as part of the thesis for the Marketing specialization of the MSc in Economics and Business.

The purpose of this experiment is to analyze the decision-making process and the act of choosing in a simulated online environment.

The survey will take about 5 minutes to perform. After completing the survey, you can fill in your e-mail address, for a chance to win a **25€ gift voucher**.

All answers are anonymous, the data will remain confidential and will be used for research purposes only.

Please answer all the questions as truthfully as possible, and keep in mind that there are no right or wrong answers.

Thank you for your participation!

P.S.: This survey contains credits to get free survey responses at SurveySwap.io

I understood the above, and agree to participate in the experiment.

Yes

No

Please read the instructions below before going to the next section.

Imagine that you are online shopping for a new pair of headphones. Each pair of headphones has 5 attributes: the brand name and class type, 3 features, and the price. The features to consider are battery life, noise cancellation, and audio quality. Your budget is between 40€ - 120€.

Please imagine that this is a real scenario and that you are browsing an online store.

Your task is to carefully assess each product, and choose whether to buy one or not. If you don't want to choose any pair of headphones, you can do so by selecting the option: "Search later".

→

Which pair of headphones would you choose, if any?

Search later

Zvany (Middle class) Medium-high battery life Noise-canceling - no High-resolution audio - no **68,95€**

Foriox (Middle class) Medium-high battery Noise-canceling - yes High-resolution audio - no **100,50€**

Mengary (Basic class) High-battery life Noise-canceling - yes High-resolution audio - yes **84,99€**

Hemoly (Basic class) Low-medium battery life Noise-canceling - no High-resolution audio - no **56€**

Wosofy (Basic class) Medium battery-life Noise-canceling - no High-resolution audio - no **44€**

Wengty (Middle class) Medium battery-life Noise-canceling - no High-resolution audio - no **101,98€**

Lonicy (Basic class) Medium-high battery life Noise-canceling - no High-resolution audio - no **43,26€**

Foniry (Middle class) Medium battery life Noise-canceling - yes High-resolution audio - yes **115€**

Hoones (Middle class) High battery life Noise-canceling - yes High-resolution audio - yes **119€**

Yonota (Middle class) Medium-high battery life Noise-canceling - yes High-resolution audio - yes **119,95€**

Ermofy (Middle class) High battery life Noise-canceling - yes High-resolution audio - yes **78,87€**

Yomith (Basic class) High battery life Noise-canceling - no High-resolution audio - no **42,95€**

Yesofy (Middle class) Medium battery life Noise canceling - yes High-resolution audio - yes
60,83€

Waniry (Basic class) Medium battery life Noise-canceling - no High-resolution audio - yes **54,99€**

Hynaty (Basic class) Medium-high battery life Noise-canceling - yes High-resolution audio - yes **54,99€**

Tozti (Basic class) Medium-high battery Noise-canceling - yes High-resolution audio - no **43,99€**

How do you evaluate the options available?

	Few chances to find the best option (1)	(2)	(3)	Average chances to find the best option (4)	(5)	(6)	A lot of chances to find the best option (7)
How do you evaluate the options available?	○	○	○	○	○	○	○

Please fill in the following questions

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
There were too many options in the choice set	○	○	○	○	○	○	○
There were enough options in the choice set	○	○	○	○	○	○	○

Please rate the attractiveness of the presented products

	Not at all attractive (1)	(2)	(3)	Average attractiveness (4)	(5)	(6)	Very attractive (7)
Please rate the attractiveness of the presented products	○	○	○	○	○	○	○

Please fill in the following questions

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The assortment was attractive	○	○	○	○	○	○	○
There was a relatively more attractive option in the choice set, compared to others	○	○	○	○	○	○	○

How pressured did you feel when making your choice?

	Not at all pressured (1)	(2)	(3)	Average pressure (4)	(5)	(6)	Very pressured (7)
How pressured did you feel when making your choice?	○	○	○	○	○	○	○

How fast did you need to make your decisions?

	Not at all fast (1)	(2)	(3)	Neither fast nor slow (4)	(5)	(6)	Very fast (7)
How fast did you need to make your decisions?	○	○	○	○	○	○	○

Please fill in the following question

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I had enough time to make my decision	○	○	○	○	○	○	○

→

Please fill in the following questions

	Not at all likely (1)	(2)	(3)	Neither likely nor unlikely (4)	(5)	(6)	Very likely (7)
How likely would you be to encounter such products in a real-life scenario?	○	○	○	○	○	○	○
How likely would you be to do the things described in the scenario?	○	○	○	○	○	○	○

Please indicate the degree to which you agree with the following statements

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I am knowledgeable about this product	○	○	○	○	○	○	○
Some headphones features were more important for me, than others (e.g. a high battery life is more important than noise canceling)	○	○	○	○	○	○	○
I was trying to find the best deal (e.g. a pair of headphones with all the good features, and at a good price)	○	○	○	○	○	○	○

→

What is your age?

What is your gender?

- Male
- Female
- Other

Where do you currently live? (country)

What is the highest level of education you have completed?

- Secondary school
- Some post-secondary / college
- Bachelor degree
- Master degree
- PhD

Please indicate the degree to which you agree with the following statement

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
I am experienced in online shopping	○	○	○	○	○	○	○

If you want to have a chance to win a 25€ gift voucher, insert your e-mail address below

Appendix D: Manipulation and reliability analyses

Table 1: Reliability analyses for the final sample

Variable	Cronbach alpha	N
Assortment size	0.697	200
Choice set complexity	0.719	200
Time pressure	0.676	200

Table 2: Manipulation check assortment size

Group Statistics

	Group_Assort Size	N	Mean	Std. Deviation	Std. Error Mean
Size	High Size	98	5.2143	1.13494	.11465
	Low Size	102	3.8889	1.21263	.12007

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
						Significance				95% Confidence Interval of the Difference
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Assortment_Size	Equal variances assumed	.016	.901	7.973	198	<.001	<.001	1.32540	.16623	.99758	1.65321
	Equal variances not assumed			7.984	197.866	<.001	<.001	1.32540	.16601	.99802	1.65278

Table 3: Manipulation check choice set complexity

Group Statistics

	Group_Complexity	N	Mean	Std. Deviation	Std. Error Mean
Complexity	Low Complexity	100	4.9633	1.01492	.10149
	High Complexity	100	3.9133	1.06323	.10632

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Complexity	Equal variances assumed	.046	.830	7.143	198	<.001	<.001	1.05000	.14699	.76014	1.33986
	Equal variances not assumed			7.143	197.573	<.001	<.001	1.05000	.14699	.76013	1.33987

Table 4: Manipulation check time pressure

Group Statistics

	Group_TimePressure	N	Mean	Std. Deviation	Std. Error Mean
Time_Pressure	With TP	95	4.7053	1.34469	.13796
	No TP	105	2.9556	1.05922	.10337

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
						Significance				95% Confidence Interval of the Difference
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Time_Pressure	Equal variances assumed	8.268	.004	10.270	198	<.001	<.001	1.74971	.17037	1.41373	2.08569
	Equal variances not assumed			10.150	178.359	<.001	<.001	1.74971	.17239	1.40952	2.08990

Appendix E: Descriptive statistics

Table 1: Distribution of survey respondents across conditions

Conditions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Condition 1 and 5	54	27.0	27.0	27.0
	Condition 2 and 6	46	23.0	23.0	50.0
	Condition 3 and 7	48	24.0	24.0	74.0
	Condition 4 and 8	52	26.0	26.0	100.0
	Total	200	100.0	100.0	

Gender

Table 2: Gender frequencies

Conditions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Condition 1 and 5	54	27.0	27.0	27.0
	Condition 2 and 6	46	23.0	23.0	50.0
	Condition 3 and 7	48	24.0	24.0	74.0
	Condition 4 and 8	52	26.0	26.0	100.0
	Total	200	100.0	100.0	

Table 3: Gender crosstabs

*Conditions * What is your gender? Crosstabulation*

Count

		What is your gender?			
		Male	Female	Other	Total
Conditions	Condition 1 and 5	24	29	1	54
	Condition 2 and 6	13	30	3	46
	Condition 3 and 7	16	32	0	48
	Condition 4 and 8	19	32	1	52
Total		72	123	5	200

Table 4: Gender Chi-square test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	7.115[a]	6	.310
Likelihood Ratio	7.413	6	.284
Linear-by-Linear Association	.204	1	.651
N of Valid Cases	200		

a. 4 cells (33.3%) have expected count less than 5. The minimum expected count is 1.15.

Age

Table 5: Age frequencies

What is your age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15	1	.5	.5	.5
	16	3	1.5	1.5	2.0
	18	6	3.0	3.0	5.0
	19	2	1.0	1.0	6.0
	20	11	5.5	5.5	11.5
	21	10	5.0	5.0	16.5
	22	18	9.0	9.0	25.5
	23	21	10.5	10.5	36.0
	24	34	17.0	17.0	53.0
	25	19	9.5	9.5	62.5
	26	15	7.5	7.5	70.0
	27	9	4.5	4.5	74.5
	28	6	3.0	3.0	77.5
	29	3	1.5	1.5	79.0
	30	7	3.5	3.5	82.5
	31	3	1.5	1.5	84.0
	32	1	.5	.5	84.5
	33	5	2.5	2.5	87.0
	34	1	.5	.5	87.5
	35	3	1.5	1.5	89.0
	36	2	1.0	1.0	90.0
	37	2	1.0	1.0	91.0
	39	2	1.0	1.0	92.0
	40	3	1.5	1.5	93.5
	41	1	.5	.5	94.0
	44	1	.5	.5	94.5
	45	1	.5	.5	95.0
	46	2	1.0	1.0	96.0
	48	1	.5	.5	96.5
	49	1	.5	.5	97.0
	50	3	1.5	1.5	98.5

	57	1	.5	.5	99.0
	62	2	1.0	1.0	100.0
	Total	200	100.0	100.0	

Table 6: Age Kruskal-Wallis test

Ranks

	Conditions	N	Mean Rank
What is your age?	Condition 1 and 5	54	92.16
	Condition 2 and 6	46	108.11
	Condition 3 and 7	48	94.18
	Condition 4 and 8	52	108.27
	Total	200	

Test Statistics[a,b]

	What is your age?
Kruskal-Wallis H	3.456
df	3
Asymp. Sig.	.326

a. Kruskal Wallis Test

b. Grouping Variable: Conditions

Place of residence

Table 7: Place of residence frequencies

Where do you currently live?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Australia	7	3.5	3.5	3.5
	Azerbaijan	1	.5	.5	4.0
	Bangladesh	1	.5	.5	4.5
	Belarus	1	.5	.5	5.0
	Belgium	1	.5	.5	5.5
	Bosnia and Herzegovina	1	.5	.5	6.0
	Brazil	1	.5	.5	6.5
	Canada	6	3.0	3.0	9.5
	Denmark	1	.5	.5	10.0
	Finland	2	1.0	1.0	11.0
	France	1	.5	.5	11.5
	Germany	6	3.0	3.0	14.5
	India	3	1.5	1.5	16.0
	Ireland	10	5.0	5.0	21.0
	Italy	3	1.5	1.5	22.5
	Kenya	4	2.0	2.0	24.5
	Latvia	1	.5	.5	25.0
	Lebanon	1	.5	.5	25.5
	Macedonia	1	.5	.5	26.0
	Malaysia	3	1.5	1.5	27.5
	Malta	1	.5	.5	28.0
	Moldova	23	11.5	11.5	39.5
	Morocco	1	.5	.5	40.0
	Philippines	2	1.0	1.0	41.0
	Poland	3	1.5	1.5	42.5
	Portugal	2	1.0	1.0	43.5
	Romania	31	15.5	15.5	59.0
	Serbia	1	.5	.5	59.5
	Singapore	1	.5	.5	60.0
	South Africa	4	2.0	2.0	62.0

	Spain	1	.5	.5	62.5
	Sweden	1	.5	.5	63.0
	Switzerland	2	1.0	1.0	64.0
	The Czech Republic	1	.5	.5	64.5
	The Netherlands	17	8.5	8.5	73.0
	United Kingdom	27	13.5	13.5	86.5
	United States	27	13.5	13.5	100.0
	Total	200	100.0	100.0	

Table 8: Place of residence crosstabs

*Where do you currently live? * Conditions Crosstabulation*

Count

		Conditions				
		Condition 1 and 5	Condition 2 and 6	Condition 3 and 7	Condition 4 and 8	Total
Where do you currently live?	Australia	3	2	1	1	7
	Azerbaijan	0	1	0	0	1
	Bangladesh	1	0	0	0	1
	Belarus	0	1	0	0	1
	Belgium	0	0	0	1	1
	Bosnia and Herzegovina	1	0	0	0	1
	Brazil	0	0	0	1	1
	Canada	3	1	1	1	6
	Denmark	1	0	0	0	1
	Finland	0	1	0	1	2
	France	0	0	0	1	1
	Germany	1	0	1	4	6
	India	0	2	1	0	3
	Ireland	0	5	1	4	10
	Italy	1	1	1	0	3
	Kenya	3	1	0	0	4
	Latvia	0	1	0	0	1
	Lebanon	0	0	1	0	1

	Macedonia	0	0	0	1	1
	Malaysia	2	0	0	1	3
	Malta	0	0	1	0	1
	Moldova	4	5	7	7	23
	Morocco	1	0	0	0	1
	Philippines	0	0	1	1	2
	Poland	1	1	0	1	3
	Portugal	1	1	0	0	2
	Romania	12	6	6	7	31
	Serbia	0	0	0	1	1
	Singapore	0	0	0	1	1
	South Africa	2	0	2	0	4
	Spain	1	0	0	0	1
	Sweden	1	0	0	0	1
	Switzerland	1	0	1	0	2
	The Czech Republic	0	0	1	0	1
	The Netherlands	7	3	3	4	17
	United Kingdom	4	9	6	8	27
	United States	3	5	13	6	27
Total		54	46	48	52	200

Table 9: Place of residence Chi-square test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	113.385[a]	108	.342
Likelihood Ratio	119.634	108	.209
N of Valid Cases	200		

a. 132 cells (89.2%) have expected count less than 5. The minimum expected count is .23.

Education

Table 10: Education frequencies

What is the highest level of education you have completed?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Secondary school	19	9.5	9.5	9.5
	Some post-secondary / college	29	14.5	14.5	24.0
	Bachelor degree	82	41.0	41.0	65.0
	Master degree	69	34.5	34.5	99.5
	PhD	1	.5	.5	100.0
	Total	200	100.0	100.0	

Table 11: Education crosstabs

*Conditions * What is the highest level of education you have completed? Crosstabulation*

Count

		What is the highest level of education you have completed?					
		Secondary school	Some post-secondary / college	Bachelor degree	Master degree	PhD	Total
Conditions	Condition 1 and 5	8	5	21	20	0	54
	Condition 2 and 6	2	8	19	17	0	46
	Condition 3 and 7	5	10	17	16	0	48
	Condition 4 and 8	4	6	25	16	1	52
Total		19	29	82	69	1	200

Table 12: Education Chi-square test

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.359[a]	12	.585
Likelihood Ratio	10.299	12	.590
Linear-by-Linear Association	.039	1	.843
N of Valid Cases	200		

a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is .23.

Appendix F: Hypotheses testing

Table 1: Box-Tidwell test

Variables in the Equation

							95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	What is your age? by Log_Age	-.011	.028	.160	1	.689	.989	.936	1.045
	Constant	-2.758	1.084	6.468	1	.011	.063		

Table 2: Multicollinearity test

Coefficients[a]

		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
Model		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	1.774	.824		2.153	.033		
	Group_AssortSize	.239	.193	.084	1.243	.216	.941	1.062
	Group_Complexity	.306	.189	.107	1.623	.106	.982	1.018
	Group_TimePressure	-.065	.188	-.023	-.346	.729	.993	1.007
	Please indicate the degree to which you agree with the following statements - Some headphones features were more important for me, than others (e.g. a high battery life is more important than noise canceling)	.135	.072	.129	1.871	.063	.900	1.111
	What is your age?	-.014	.012	-.076	-1.131	.260	.943	1.060
	What is your gender?	-.476	.181	-.174	-2.638	.009	.983	1.018
	What is the highest level of education you have completed?	.324	.101	.213	3.198	.002	.959	1.043
	Please indicate the degree to which you agree with the following statement - I am experienced in online shopping	.257	.074	.241	3.473	<.001	.887	1.128

Binary logistic regressions

Table 3: Descriptive statistics logistic regressions

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	200	100.0
	Missing Cases	0	.0
	Total	200	100.0
Unselected Cases		0	.0
Total		200	100.0

a. If weight is in effect, see classification table for the total number of cases.

Dependent Variable Encoding

Original Value	Internal Value
No deferral	0
Deferral	1

Table 4: Dummy variables coding

Categorical Variables Codings

			Parameter coding			
		Frequency	(1)	(2)	(3)	(4)
What is the highest level of education you have completed?	Secondary school	19	.000	.000	.000	.000
	Some post-secondary / college	29	1.000	.000	.000	.000
	Bachelor degree	82	.000	1.000	.000	.000
	Master degree	69	.000	.000	1.000	.000
	PhD	1	.000	.000	.000	1.000
What is your gender?	Male	72	.000	.000		
	Female	123	1.000	.000		
	Other	5	.000	1.000		

Table 5: Binary logistic regression model 1

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Group_AssortSize	34.592	18432.664	.000	1	.999	1054792062212348.100	.000	.
	Group_Complexity	34.757	9543.717	.000	1	.997	1243905749415679.200	.000	.
	Group_TimePressure	15.322	15607.947	.000	1	.999	4510989.825	.000	.
	Group_AssortSize by Group_Complexity	-19.686	14504.143	.000	1	.999	.000	.000	.
	Group_AssortSize by Group_TimePressure	-.060	7884.791	.000	1	1.000	.942	.000	.
	Group_AssortSize by Group_Complexity by Group_TimePressure	1.421	6848.349	.000	1	1.000	4.143	.000	.
	What is your age?	-.085	.078	1.206	1	.272	.918	.789	1.069
	What is your gender?			.301	2	.860			
	What is your gender?(1)	-.454	.829	.301	1	.584	.635	.125	3.223
	What is your gender?(2)	-.457	16916.683	.000	1	1.000	.633	.000	.
	What is the highest level of education you have completed?			1.275	4	.866			
	What is the highest level of education you have completed?(1)	19.225	7598.855	.000	1	.998	223552278.443	.000	.
	What is the highest level of education you have completed?(2)	17.980	7598.855	.000	1	.998	64334924.530	.000	.
	What is the highest level of education you have completed?(3)	18.796	7598.855	.000	1	.998	145511083.884	.000	.
	What is the highest level of education you have completed?(4)	21.302	42700.552	.000	1	1.000	1782986971.818	.000	.
	Online shopping experience	.130	.327	.157	1	.692	1.139	.599	2.163
	Preference uncertainty	-.370	.329	1.269	1	.260	.691	.363	1.315
	Constant	-117.965	37369.863	.000	1	.997	.000		

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	23.815	15	.068
	Block	23.815	15	.068
	Model	23.815	15	.068

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	43.363[a]	.112	.393

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	4.135	8	.845

Table 6: Binary logistic regression model 2

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Group_AssortSize	34.451	18730.895	.000	1	.999	916310510594281.800	.000	.
	Group_Complexity	35.300	10027.055	.000	1	.997	2140817077252207.800	.000	.
	Group_TimePressure	15.355	15991.954	.000	1	.999	4662260.493	.000	.
	Group_AssortSize by Group_Complexity	-19.446	14695.317	.000	1	.999	.000	.000	.
	Group_AssortSize by Group_TimePressure	.474	7910.507	.000	1	1.000	1.607	.000	.
	Group_AssortSize by Group_Complexity by Group_TimePressure	1.046	6906.819	.000	1	1.000	2.847	.000	.
	Constant	-104.354	37750.960	.000	1	.998	.000		

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	18.395	6	.005
	Block	18.395	6	.005
	Model	18.395	6	.005

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	48.782[a]	.088	.308

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	.000	6	1.000

Table 7: Binary logistic regression model 3

Variables in the Equation

							95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Group_AssortSize	1.224	.938	1.705	1	.192	3.401	.541	21.363
	Group_Complexity	1.511	.937	2.602	1	.107	4.531	.723	28.411
	Group_TimePressure	19.020	3646.015	.000	1	.996	182097434.856	.000	.
	What is your age?	-.089	.078	1.294	1	.255	.915	.785	1.066
	What is your gender?			.254	2	.881			
	What is your gender?(1)	-.421	.834	.254	1	.614	.657	.128	3.367
	What is your gender?(2)	.180	16665.137	.000	1	1.000	1.197	.000	.
	What is the highest level of education you have completed?			1.475	4	.831			
	What is the highest level of education you have completed?(1)	19.613	7617.337	.000	1	.998	329323209.095	.000	.
	What is the highest level of education you have completed?(2)	18.224	7617.337	.000	1	.998	82167503.239	.000	.
	What is the highest level of education you have completed?(3)	19.021	7617.337	.000	1	.998	182322305.554	.000	.
	What is the highest level of education you have completed?(4)	19.607	41070.574	.000	1	1.000	327619916.123	.000	.
	Online shopping experience	.111	.320	.121	1	.728	1.118	.597	2.094
	Preference uncertainty	-.395	.336	1.379	1	.240	.674	.349	1.302
	Constant	-59.566	10545.023	.000	1	.995	.000		

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	22.650	12	.031
	Block	22.650	12	.031
	Model	22.650	12	.031

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	44.528[a]	.107	.375

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	4.518	8	.808

Table 8: Backward stepwise (LR) model 4

Variables in the Equation

								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Group_AssortSize	1.224	.938	1.705	1	.192	3.401	.541	21.363
	Group_Complexity	1.511	.937	2.602	1	.107	4.531	.723	28.411
	Group_TimePressure	19.020	3646.015	.000	1	.996	182097434.856	.000	.
	What is your age?	-.089	.078	1.294	1	.255	.915	.785	1.066
	What is your gender?			.254	2	.881			
	What is your gender?(1)	-.421	.834	.254	1	.614	.657	.128	3.367
	What is your gender?(2)	.180	16665.137	.000	1	1.000	1.197	.000	.
	What is the highest level of education you have completed?			1.475	4	.831			
	What is the highest level of education you have completed?(1)	19.613	7617.337	.000	1	.998	329323209.095	.000	.
	What is the highest level of education you have completed?(2)	18.224	7617.337	.000	1	.998	82167503.239	.000	.
	What is the highest level of education you have completed?(3)	19.021	7617.337	.000	1	.998	182322305.554	.000	.
	What is the highest level of education you have completed?(4)	19.607	41070.574	.000	1	1.000	327619916.123	.000	.
	Online shopping experience	.111	.320	.121	1	.728	1.118	.597	2.094
	Preference uncertainty	-.395	.336	1.379	1	.240	.674	.349	1.302
	Constant	-59.566	10545.023	.000	1	.995	.000		
Step 2[a]	Group_AssortSize	1.230	.940	1.709	1	.191	3.420	.541	21.598
	Group_Complexity	1.500	.935	2.573	1	.109	4.480	.717	27.991
	Group_TimePressure	19.010	3556.125	.000	1	.996	180193812.312	.000	.
	What is your age?	-.092	.075	1.495	1	.221	.912	.787	1.057

	What is the highest level of education you have completed?			1.790	4	.774			
	What is the highest level of education you have completed?(1)	19.682	7619.954	.000	1	.998	353140593.027	.000	.
	What is the highest level of education you have completed?(2)	18.156	7619.953	.000	1	.998	76766519.139	.000	.
	What is the highest level of education you have completed?(3)	18.943	7619.954	.000	1	.998	168562854.177	.000	.
	What is the highest level of education you have completed?(4)	19.460	41063.178	.000	1	1.000	282732772.860	.000	.
	Online shopping experience	.113	.314	.129	1	.720	1.119	.604	2.073
	Preference uncertainty	-.422	.331	1.617	1	.203	.656	.343	1.256
	Constant	-59.527	10423.424	.000	1	.995	.000		
Step	Group_AssortSize	1.339	.896	2.235	1	.135	3.816	.659	22.093
3[a]	Group_Complexity	1.462	.925	2.500	1	.114	4.314	.704	26.421
	Group_TimePressure	19.005	3560.424	.000	1	.996	179439624.976	.000	.
	What is your age?	-.089	.075	1.415	1	.234	.915	.791	1.059
	What is the highest level of education you have completed?			1.713	4	.788			
	What is the highest level of education you have completed?(1)	19.577	7664.032	.000	1	.998	317769023.224	.000	.
	What is the highest level of education you have completed?(2)	18.105	7664.032	.000	1	.998	72922289.303	.000	.
	What is the highest level of education you have completed?(3)	18.853	7664.032	.000	1	.998	154130542.441	.000	.
	What is the highest level of education you have completed?(4)	19.178	41071.753	.000	1	1.000	213350639.657	.000	.
	Preference uncertainty	-.379	.307	1.522	1	.217	.685	.375	1.250

	Constant	-59.234	10461.543	.000	1	.995	.000		
Step	Group_AssortSize	1.205	.857	1.976	1	.160	3.338	.622	17.913
4[a]	Group_Complexity	1.226	.874	1.967	1	.161	3.409	.614	18.921
	Group_TimePressure	18.809	3736.275	.000	1	.996	147484940.330	.000	.
	What is your age?	-.044	.058	.572	1	.449	.957	.854	1.072
	Preference uncertainty	-.226	.269	.706	1	.401	.798	.471	1.351
	Constant	-41.649	7472.550	.000	1	.996	.000		
Step	Group_AssortSize	1.166	.855	1.860	1	.173	3.208	.601	17.131
5[a]	Group_Complexity	1.128	.858	1.730	1	.188	3.089	.575	16.588
	Group_TimePressure	18.806	3758.879	.000	1	.996	147075358.607	.000	.
	Preference uncertainty	-.190	.272	.489	1	.484	.827	.485	1.410
	Constant	-42.744	7517.758	.000	1	.995	.000		
Step	Group_AssortSize	1.206	.851	2.008	1	.156	3.341	.630	17.722
6[a]	Group_Complexity	1.109	.852	1.693	1	.193	3.031	.570	16.116
	Group_TimePressure	18.795	3785.142	.000	1	.996	145423943.778	.000	.
	Constant	-43.721	7570.285	.000	1	.995	.000		
Step	Group_AssortSize	1.260	.844	2.226	1	.136	3.525	.674	18.445
7[a]	Group_TimePressure	18.816	3842.870	.000	1	.996	148493391.364	.000	.
	Constant	-42.049	7685.740	.000	1	.996	.000		
Step	Group_TimePressure	18.816	3922.430	.000	1	.996	148549462.658	.000	.
8[a]	Constant	-40.019	7844.860	.000	1	.996	.000		

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	44.528[a]	.107	.375
2	44.780[a]	.106	.371
3	44.913[a]	.105	.369
4	49.293[a]	.086	.300
5	49.945[a]	.083	.289
6	50.422[a]	.080	.282
7	52.335[a]	.072	.251
8	54.898[a]	.060	.209

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	4.518	8	.808
2	3.994	8	.858
3	4.986	8	.759
4	1.801	8	.987
5	.429	8	1.000
6	1.124	6	.980
7	.000	2	1.000
8	.000	0	.

Appendix G: Time spent on products page

Figure 1: Assumptions ANOVA

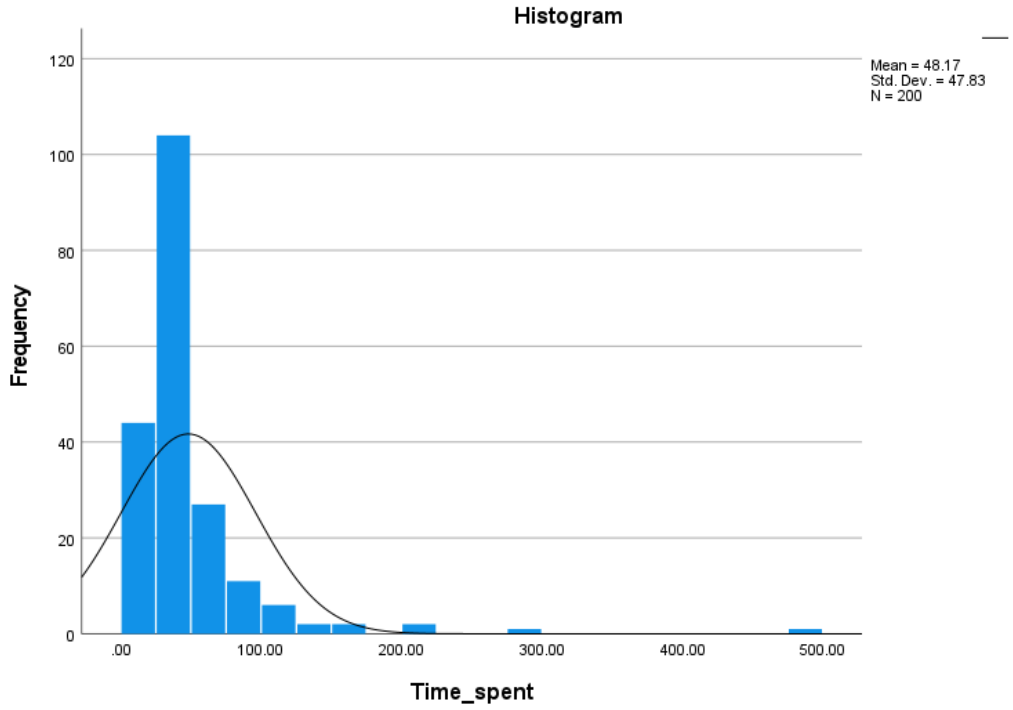

Table 1: Kruskal-Wallis H test

Ranks

	Deferral	N	Mean Rank
Time_spent	No deferral	192	100.54
	Deferral	8	99.56
	Total	200	

Test Statistics

	Time_spent
Kruskal-Wallis H	.002
df	1
Asymp. Sig.	.963