

“Scarcity appeals and the influence on Dutch consumers: a study about the effect of limited time scarcity and demand caused scarcity appeals on the decision-making process of Dutch consumers”

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EXECUTIVE SUMMARY

Retailers tend to desire a ‘hot’ product, which consumers decide to purchase, without losing interest over time. Marketeers aim to fulfill this dream, for which there are many strategies they can apply to influence the decision-making process of consumers. Consciously using scarcity as a marketing tool is referred to as scarcity strategy. Companies believe that the use of both demand and supply caused scarcity appeals will increase the popularity of their product, and this assumption is shared by various researchers. However, a lot of factors need to be considered to benefit from emphasizing scarcity. Before consumers decide to purchase a product, they figuratively walk through the decision-making process. This six-stage process is influenced by many internal and external factors. Therefore, the central research question is as follows:

“To what extent does the use of limited time scarcity appeals and demand caused scarcity appeals influence the decision making process of Dutch consumers?”

The effect of emphasizing scarcity at the launch of a new product has been researched in the past with a sample of German consumers. However, this effect has not yet been researched with a sample of Dutch consumers, so this research is relevant to fill this gap for researchers in the field of scarcity strategy. Besides that, the outcome of this research is relevant to marketeers. They can use the outcomes of this research to evaluate which type of scarcity appeals works best on Dutch consumers.

To help answer the central research question, the following sub questions are formulated:

Four theoretical sub-questions:

- i. What is scarcity strategy?
- ii. What is the decision-making process?
- iii. How are the scarcity strategy and the decision-making process related?
- iv. How are scarcity strategy and marketing related?

Four empirical sub-questions:

- a. What is scarcity strategy in the Netherlands?
- b. What is the decision-making process of Dutch consumers?
- c. How are scarcity strategy and the decision-making process of Dutch consumers related?
- d. How are scarcity strategy and marketing related in the Netherlands?

From the literature study it followed that a feeling of competition is created due to demand caused scarcity appeals. This competition decreases the time spent on the information search, and it could also induce aggressive feelings towards other consumers. Besides that, the created time pressure could lead to impulsive purchases, which is expected to decrease the time spent on the information search. Another effect of the time pressure is the chance of regrets because of an impulsive purchase. From the literature it followed that popularity of a product is associated with a high quality and a high perceived value. Since demand caused scarcity appeals address the popularity of products, this type of appeals is expected to increase the perceived quality and the perceived value of the product. However, for scarcity appeals to work at its best, it is important that the product is in the consumers' consideration set. Hence, scarcity appeals are expected to have a greater influence if a product is in the consideration set. These key findings are summarized into the following hypotheses:

H1: The use of demand caused scarcity appeals of a product increases the feeling of competition between consumers.

H2: The use of limited time scarcity appeals decreases the time spent on the information search stage.

H3: The use of demand caused scarcity appeals decreases the time spent on the external information search through perceived competition.

H4a: Limited time scarcity appeals increase the purchase intention to a greater extent if the product is in the consideration set.

H4b: Demand caused scarcity appeals increase the purchase intentions to a greater extent if the product is in the consideration set.

H5: The use of limited time scarcity appeals increases the feeling of post purchase regrets.

H6: The use of demand caused scarcity appeals increases the perceived value of the product.

H7: The use of demand caused scarcity appeals increases the perceived quality of the product.

H8: Perceived competition increases aggressive feelings towards other consumers.

The desk research in the literature study was followed by quantitative field research, for which primary data was collected through a direct survey. The target respondents were Dutch consumers, and the desired sample size n was 220 randomly selected respondents. After conducting the survey, 238 complete responses of Dutch consumers were used in the analysis. The first part of the survey asked respondents to answer statements on a scale from 1 (strongly disagree) to 5 (strongly agree). The survey showed three advertisements: (1) a neutral advertisement (2) a limited time scarcity advertisement and (3) a demand caused scarcity advertisement. The last questions were about the

gender, age and education level to check the representativeness of the sample. The data derived from the survey was analyzed by performing both Wilcoxon Signed Rank tests, and Mann-Whitney U-tests using SPSS.

From the field research about Dutch consumers, it followed that they experience more competition for a purchase, if the product is accompanied by demand caused scarcity appeals. Hypothesis 1 is thus accepted. Furthermore, this competition is found to induce frustration and aggressive or jealous feelings towards other consumers. Hypothesis 8 is thus accepted. The competition was expected to decrease the time spent on the information search. However, this research does not confirm this effect for Dutch consumers: Hypothesis 3 is thus rejected. Related to the evaluation stage, this research showed that Dutch consumers assign both a higher value and a higher quality to a product accompanied by demand caused scarcity appeals. Because of this, Hypothesis 6 and Hypothesis 7 are both accepted. The second relationship examined was the effect of limited time scarcity appeals on the decision-making process of Dutch consumers. It was found that limited time scarcity appeals decrease the time spent on the external information search of Dutch consumers, due to the time pressure experienced. This means that Hypothesis 2 is accepted. The time pressure due to these appeals was expected to increase the feeling of post-purchase regrets. However, this research cannot confirm that relationship. Hypothesis 5 is thus rejected. The third main finding from the field research is that the purchase intentions increased more due to the scarcity appeals for Dutch consumers who indicated that the product was in their consideration set. This led to Hypothesis 5 being accepted.

To conclude, the most important findings from this research are that for Dutch consumers (1) limited time scarcity appeals decrease the time spent on the information search stage, (2) the use of demand caused scarcity appeals induces a feeling of competition between consumers which can lead to aggressive feelings and that (3) the use of demand caused scarcity appeals increases the perceived value and the perceived quality in the evaluation stage. Besides that, it is found that (4) scarcity appeals influence the purchase intentions more if the product is in the consideration set during the generation of alternatives in the decision-making process of a Dutch consumer. If companies thus want to influence the information search and speed up the decision-making process, limited time scarcity appeals are recommended. On the other hand, if they prefer to influence the evaluation stage of Dutch consumers, using demand caused scarcity appeals is recommended. Future research could elaborate on the other types of scarcity that exist or it could further investigate the different influences of scarcity strategy per demographic group, such that marketers have more information for their specific target group.

CHAPTER 1 INTRODUCTION

Retailers tend to desire a ‘hot’ product, which consumers decide to purchase, without losing interest over time, because of the hype around that product. Marketeers aim to fulfill this dream, for which there are many strategies they can apply to influence the decision-making process of consumers. Offering products with limited availability or excess demand is one of the options. consciously using this concept as a marketing tool is referred to as scarcity strategy. This research dives into the use of scarcity strategy and the effect that the use of different types of scarcity appeals on the decision-making process of Dutch consumers. All of these concepts are explained in Chapter 2.

1.1 Scarcity strategy

Scarcity messages are of great importance in marketing. This scarcity effect can be caused by either high demand or low supply (Verhallen T. , 1982). Companies assume that the use of both demand and supply caused scarcity appeals will increase the popularity of their product, and this assumption is shared by various researchers. However, a lot of factors need to be considered to benefit from emphasizing scarcity. Before consumers decide to purchase a product, they figuratively walk through the decision-making process. This six-stage process is influenced by many internal and external factors, which are explained in section 2.2. One of the influences on the decision-making process can be the awareness of consumers. In case of multiple advertisements with limited editions or other scarcity appeals, consumers might realize that these limited editions are used as a marketing tool. This possibly creates an aversion against it, because they start to understand the supplier’s intentions of the messages (Chae, Kim, Lee, & Park, 2019). Another way to use of the scarcity effect, is activation of this effect through high, or even excess, demand. This can be emphasized by adding messages containing the popularity among other consumers, for example “nearly sold out due to high demand”. Both the high demand and the low supply are signals that imply exclusivity of the product to the consumers (Gierl & Huettl, 2010).

Besides the two causes for scarcity, there are two main types of scarcity messages: limited quantity scarcity and limited time scarcity. The limited quantity message announces a predefined quantity at the launch of the product. In that case, the product is only available while stock lasts. On the other hand, limited time scarcity indicates that the product is available for a predefined time frame, which will be mentioned at the launch as well. After this time period, the product becomes unavailable (Aggerwal, Jun, & Huh, 2011). The concept of scarcity and the related strategy is further discussed in section 2.1.

1.2 Scarcity messages in practice

An example of the use of scarcity appeals as a marketing tool can be seen in the market for automobiles. Cars can be used to express status, a feeling that can be enhanced using scarcity messages (Gierl & Huettl, 2010). An example that can be taken from the car industry is the Mercedes CLK320 Convertible. Mercedes announced beforehand that production would be limited, which caused consumers to sign up for a waiting list. Mercedes did not show signs of increasing production, perhaps to enhance the image of the CLK 320 convertible as a hard-to-get car. According to car dealers, that is exactly what the manufacturers goal is when using the scarcity messages (Stock & Balachander, 2005). This strategy can also be seen at Ferrari, who produce a predefined number of cars, even though the waiting time for Ferrari cars is already a two-year list (Amaldoss & Jain, 2005). The use of quantity scarcity messages in the introductory phase of passenger car models in the US has indeed shown to have a positive relationship with the preference for these cars (Balachander, Liu, & Stock, 2009).

Another example can be taken from the market for videogames. In 1989, when the Super Mario Brothers game device was launched, Nintendo advertised this device as having excess demand, which created a fuzz around this product. The effect that this demand caused scarcity message had, is that buyers started making their purchase decision before being fully informed, instead of after informing themselves (DeGraba, 1995). Hence, it was found that the information search in the decision-making process was shorter than it would be without the demand caused scarcity appeals. Later, limited quantity messages have been used at the launch of the PlayStation 2. Sony claimed to lack resources to increase the production, which caused a limited availability in terms of the quantity of PlayStation 2 devices. The actual shortage was doubted, and experts even thought that this claim was merely to create an urge for consumers to buy the PlayStation 2, due to the limited supply (Stock & Balachander, 2005). As consumers got more willing to express themselves through the products they consume, other industries started adapting this type of strategies. Shoes are one of the many product categories, for which scarcity is used as a promotional tactic. In this case, the shoe being limited edition is used as an attribute in the positioning, which means that a supply caused scarcity strategy is used in that case (Chae, Kim, Lee, & Park, 2019).

These types of messages can be referred to as scarcity messages, which is further explained in the next section. However, these scarcity messages do not merely have positive effects. Research has shown that the scarcity messages can increase aggression towards the scarce products. One of the explanations for this behavior lies in the competition between shoppers that is created due to the limited quantity scarcity (Kristofferson, McFerron, Morales, & Dahl, 2017). This is described in section 2.3.2.

1.3 Central research question

This research aims to answer the following central research question:

“To what extent does the use of limited time scarcity appeals and demand caused scarcity appeals influence the decision making process of Dutch consumers?”

The following sub-questions help to answer the central research question:

Four theoretical sub-questions:

- i. What is scarcity strategy?
- ii. What is the decision-making process?
- iii. How are the scarcity strategy and the decision-making process related?
- iv. How are scarcity strategy and marketing related?

Four empirical sub-questions:

- a. What is scarcity strategy in the Netherlands?
- b. What is the decision-making process of Dutch consumers?
- c. How are scarcity strategy and the decision-making process of Dutch consumers related?
- d. How are scarcity strategy and marketing related in the Netherlands?

1.4 Relevance

This research provides a deep understanding of the effects of limited time scarcity and demand caused scarcity appeals on the decision-making process of Dutch consumers. The effect of using quantity scarcity as an attribute at the launch of a new product has been researched in the past with a sample of German consumers (Gierl & Huettl, 2010). However, this effect has not yet been researched with a sample of Dutch consumers, so this research can (partly) fill this gap for researchers in the field of scarcity strategy. Besides that, this research contributes to the practical knowledge for companies and marketers. More specific: for marketers who are in doubt about the right approach for the marketing tactics at the launch of a new product. They can use the outcomes of this research to evaluate which type of scarcity appeals works best on their target group, especially when the target group contains Dutch consumers. The customer journey, also known as the decision-making process, is widely used in marketing, which makes this research relevant for marketers who are planning to use scarcity appeals to influence one or more of the stages of this process. This research provides more

information on the influence that the different types of scarcity appeals have on the different stages in the decision-making process, and thus in the customer journey.

1.5 Research limitations and ethical issues

This research faced ethical issues related to the use of scarcity appeals. Marketing aims to influence the thoughts and behavior of consumers in a way that is favorable for the company. However, for example at the launch of the PlayStation 2, the actual shortage was doubted (Stock & Balachander, 2005). This creates an ethical issue, since the use of scarcity as merely a marketing tool could be dubious. If the product is not actually scarce, companies are essentially lying to their prospects or their consumers. However, this ethical issue lies beyond the scope of this research. To solve this ethical issue, legislation is needed regarding the use of scarcity messages without actual scarcity. Another limitation of this research lies in the types of scarcity appeals examined. This research is limited to the influence of demand caused scarcity appeals and limited time scarcity appeals, while there are many other types and uses of scarcity appeals. This is briefly explained in section 2.1.

1.6 Structure

This research paper is divided into five chapters. The first chapter introduces the topic and gives background information, followed by the central research question, the empirical sub questions and the theoretical sub questions. The second chapter is a literature study on the theoretical sub questions listed in section 1.3. The second chapter consists of the literature study, after which the hypotheses were formed. This is followed by the chosen research methodology for the field research and the method of data collection. The fourth chapter consists of the main findings and the outcomes that were derived from the data analysis. Finally, the fifth chapter summarizes and compares the outcome of the literature study with the field research. The answers to the theoretical and the empirical questions are compared, and the central research question is answered. Besides that, Chapter 5 addresses the limitations and provides recommendations for both companies and for further researchers.

The appendix contains the bibliography (Appendix A), information about the survey (Appendix B): the survey landingpage (B1), the survey items (B2) and the raw survey data (B3) and details about the data analysis (Appendix C).

CHAPTER 2 LITERATURE STUDY

This chapter provides desk research in the form of a literature study for this research, by elaborating on the theoretical sub-questions listed in Chapter 1. In section 2.1, scarcity strategy is introduced and explained. This is followed by an explanation of the decision-making process and its relationship with scarcity strategy in section 2.2. After that, section 2.3 links the concept of scarcity strategy to marketing. The hypotheses that were derived from the literature study are listed and shown in a conceptual research model in section 2.4, accompanied by a summary of the key findings from this chapter.

2.1 Scarcity

One of the strategies that helps companies promote their product at the launch are messages that emphasize the limited availability of products. This strategy uses the scarcity of goods, which translates into a (possibly higher) perceived value of those goods. A relevant theory related to scarcity is the commodity theory, in which the psychological effects of the scarcity concept are examined. A commodity is defined as an object that possesses the following three properties: usefulness, transferability, and potential to be possessed. These thus need to be met to make the product relevant for scarcity strategy. From this research it followed that the valuation of a commodity is strongly related to its (un)availability. The underlying motive is the consumers' wish for uniqueness: people assume that a scarce commodity indicates some sort of distinctiveness from other individuals (Brock, 1968).

Within the concept of scarcity, there are four main causes for scarcity, determined by Verhallen & Robben (1995): unavailability, restricted availability, conditional availability, and limited availability. Unavailability indicates that the product is not available (anymore), either due to nature or due to regulations. In case of restricted availability, the product is only available to certain individuals: it depends on the membership of a certain group. Conditional availability shows some similarities with restricted availability. However, in case of conditional availability, the availability to individuals depends on some condition and/or task that needs to be met or completed before the product becomes available. The last cause for scarcity is limited availability. This relates to the current market situation or other factors that decrease supply or increase demand for that particular product (Verhallen & Robben, 1995).

Besides the causes for scarcity, there are different types of scarcity: supply caused scarcity and demand caused scarcity. On the supply side, there is a division between limited quantity scarcity and limited time scarcity. The first, limited quantity scarcity, means that a product has a limited quantity produced, which causes scarcity on the supply side. In case of the second type, limited time scarcity, a

product is available for a limited time. For example, it's only available in pop-up stores, which also causes scarcity on the supply side. Demand caused scarcity, on the other hand, indicates that the scarcity effect is created due to popularity on the demand side, where demand is defined as consumers that are willing to pay a given price for that product at a given point in time (Verhallen T. , 1982).

The different effects of supply and demand caused scarcity on the perceived value have been researched in the past. Appeals that emphasize scarcity caused by popularity are found to increase the perceived value of the product. Hence, demand caused scarcity is expected to increase the perceived value of the product (Worchel, Lee, & Adewole, 1975). Demand caused scarcity is induced, when demand is greater than supply: competition on the demand side arises. Due to this competition, consumers expect the scarce product to have some sort of intangible feature or property, making it unique (Mittone & Savadori, 2009).

To summarize, scarcity can be categorized based on different criteria. The first categorization is based on the cause of the scarcity: unavailability, limited availability, restricted availability and conditional availability. The second distinction can be made based on the type of scarcity: demand caused scarcity or supply caused scarcity. Within the supply caused scarcity the distinction between limited quantity scarcity and limited time scarcity is made. From the last paragraph, it follows that quantity scarcity due to demand creates a feeling of competition between consumers. This competition might induce the expectation that the product has an intangible feature, which serves as a mediating effect for the valuation of that product. Hence, these findings led to the following hypothesis:

H1: The use of demand caused scarcity appeals of a product increases the feeling of competition between consumers.

2.2 The decision-making process and the relation with scarcity

The process before a purchase has been summarized into the decision-making process. Szmigin & Piacentini (2018) divided the process into six stages: problem recognition, information search, alternative evaluation, evaluation, outcomes of the choice, and disposal of the product. The following sections elaborate on the first five stages.

2.2.1 Problem recognition

In the first stage, problem recognition, the individual identifies a difference between the actual state (e.g. hungry) and the ideal state (e.g. not hungry). Hence, either a problem or an opportunity for improvement is identified (Marriner, 1977). There are two main types of problems to be recognized. In the first type, need recognition, moving from the actual state to the ideal state or vice versa happens

easily after a simple consumption decision. In case of the second type, opportunity recognition, there is a more complex situation: an (external) influence induces the feeling that the actual state is not the ideal state anymore. Hence, the individual was not aware of the possible improvement: the opportunity. Opportunity recognition can thus be influenced by changing the external environment, e.g. through advertisements or other marketing tactics. Using scarcity as a marketing tool can thus be of influence in this stage (Consumer behavior, 2018).

2.2.2 Information search

After recognizing the problem, the process continues with the search for product information, aiming to make better purchase decisions. The two types of information search are internal and an external search. The first type uses information from past experiences, which individuals already possess in their memory. In the second type, the external search, other sources from the individuals' environment need to contribute to the information search. In 1996, Schmidt & Spreng proposed a model in which they researched the influence of, among others, time pressure on the perceived costs of external information search process. This was found to increase the costs of information search, which in turn has a negative influence on the time spent on the external information search. Hence, since limited time scarcity appeals create time pressure, these appeals are expected to decrease the time spent on the information search stage, through the higher perceived costs (Schmidt & Spreng, 1996).

The information search stage within the decision-making process is not only entered when searching for a specific, functional goal. Past research has identified five different types of the need for information, which are possible underlying motives for the information search (Vogt & Fesenmaier, 1998). Two of these types are relevant for this research: hedonic needs and sign needs. Hedonic needs are those needs, that enhance the experience of searching, during the decision-making process. Essentially, these needs indirectly decrease the perceived cost of search, which in turn can increase the motivation to search and thus the time spent on external information search. The use of scarcity strategy intends to accelerate this process. Hence, hedonic needs are not likely to have a positive influence on the effect of scarcity appeals. The second relevant types are sign needs: information search to gain information about the image that a product represents in the individuals' social environment. As mentioned in section 2.1, demand caused scarcity can induce competition, through which consumers expect the product to have an intangible feature, which creates the sign that the product is unique to own (Schmidt & Spreng, 1996). Hence, in case of the external information search for sign needs, demand caused scarcity appeals are expected to decrease the time spent on the external information search. When using scarcity appeals as a marketing tool, it is important to

consider the needs that are intended to be initiated through the marketing strategy application (Szmigin & Piacentini, 2018).

To summarize, scarcity appeals are found to influence the decision-making process. Time pressure is induced through limited time scarcity appeals and we saw that time pressure is considered as a cost in the information search stage. Hence, limited time scarcity appeals are expected to decrease the time spent on the information search stage. This led to the following hypothesis about the relation between scarcity appeals and the decision-making process:

H2: The use of limited time scarcity appeals decreases the time spent on the information search stage.

Another influence that follows from this section is the influence of demand caused scarcity on the external information search. Consumers use this competition as an heuristic, indicating that the product has an intangible and possibly quality related feature. Hence, the time spent on external information search is expected to decrease if a feeling of competition between consumers is experienced. This led to the following hypothesis:

H3: The use of demand caused scarcity appeals decreases the time spent on the external information search through perceived competition.

2.2.3 Evaluation of alternatives

Various possible choices follow from the information search, which marks the start of the next stage: product evaluation or alternative evaluation. Product evaluation applies to the choice between brands or products. Alternative evaluation applies to a broader choice set, for example containing make-or-buy decisions (Szmigin & Piacentini, 2018). To simplify the purchase decision the individual is about to make, the results from the information search are mentally put into different categories: sets (Narayana & Markin, 1975). The first important split is the unawareness set and the awareness set. The awareness set is defined as the set of brands within a certain product class, of which the individual is aware of the existence. On the other hand, the unawareness set contains brands of which the existence is not known by the individual. Within the awareness set, there are several smaller subsets. One of these subsets of the awareness set is the evoked set. This contains all brands of which consumers expect them to actually be able to fulfill their needs. Szmigin & Piacentini (2018) specified a subset of the evoked set, the consideration set, which is defined as the brands from within the evoked set, that the consumer actually considers buying. Hence, for marketing purposes it is important to make sure that brands make it into the evoked set of the target group, and more specific: in the consideration set, such that the individual evaluates the brand positively. Simply increasing the brand awareness is thus not enough to lead to the actual purchase (Narayana & Markin, 1975).

To summarize these findings, products need to be within the consideration set to be evaluated for the purchase. Hence, marketing tools would work best for products within the consideration set: all products that can fulfill the consumers' needs, which are also being actually considered to buy. Since this research investigates the effect of demand caused scarcity appeals and limited time scarcity appeals, the fourth hypothesis is split up into Hypothesis 4a and Hypothesis 4b:

H4a: Limited time scarcity appeals increase the purchase intention to a greater extent if the product is in the consideration set.

H4b: Demand caused scarcity appeals increase the purchase intentions to a greater extent if the product is in the consideration set.

2.2.4 Evaluation: product choice

After the first three stages, the next stage is the evaluation of the generated alternatives, and thus a product choice. Here, the difference between active or passive decision-making is of great importance. The first type, active decision-making, depends on active learning: extensive information search, in order to acquire knowledge before the purchase. In that case, the decision is important to us and hence, involvement is likely to be high. The second type, passive learning, relates to information gains without active learning. For evaluating the generated alternatives when the decision relates to a problem that requires active decision making, the consumer is likely to use evaluative criteria to compare the generated alternatives and form an attitude against each alternative. However, a positive alternative does not necessarily lead to a purchase. External factors can influence the actual purchase, e.g. a product can be out of stock, which forces the individual to buy for example the second-best alternative (Szmigin & Piacentini, 2018). Previous research attempted to summarize the factors influencing the product choice. Mack & Sharples (2009) investigated the effect that usability has on the product choice when the decision-making process relates to mobile phones. They came down to nine important attributes influencing the product choice for mobile phones: cost, fashion, usability, reviews, brand, size, weight, features, and aesthetics. Hence, these are factors that should be influenced when applying marketing tools, such as scarcity strategy.

2.2.5 Outcomes of choice: post-purchase evaluation

After making the decision to purchase a product, the evaluation after the purchase is important, both for the brand name and for the evaluation of marketing strategies. An important concept in the post-purchase evaluation is the disconfirmation paradigm. This paradigm relates to the difference between the pre-purchase expectations and the actual performance of the product, the post-purchase experience. In case of a positive difference, the satisfaction is high. On the other hand,

a negative difference results in dissatisfaction, which can lead to regrets of the purchase (Szmigin & Piacentini, 2018). From section 2.2.2 it follows that time pressure possibly reduces the time spent on the information search. Hence, limited time scarcity appeals are expected to increase the chance of impulsive purchases. At first, it was assumed that not purchasing a product would create bigger regrets over time than purchasing a product, but Abendroth & Diehl (2006) found the opposite in their own research, related to scarcity messages. Scarcity messages, especially those related to limited time scarcity, might induce these impulsive purchases, which could create regrets about the purchase of this product over time. These regrets could then even influence the perceived value of the product in a negative way (Abendroth & Diehl, 2006).

To summarize, the time pressure experienced due to limited time scarcity appeals could decrease the time spent on the information search, as also seen in section 2.2.3. This possibly induces impulsive purchases, which in turn are followed by regrets of the purchase. These findings led to the following hypothesis:

H5: The use of limited time scarcity appeals increases the feeling of post purchase regrets.

2.3 The relationship between scarcity strategy and marketing

The concept of scarcity, explained in section 2.1, also relates to marketing. It has been researched in the past, that people tend to prefer scarce products. Because of this relationship between the consumers' preferences and the perceived scarcity, marketers use this as a promotional tactic, by placing emphasis on the limited availability of products, and thus emphasizing the scarcity of that product (Lindsay-Mullikin & Petty, 2011).

2.3.1 The foundation for scarcity strategy as a marketing tool

These scarcity-based marketing tactics relate, among others, to the previously researched scarcity bias. Mittone & Savadori (2009) concluded that a product is considered more attractive when it is presented as a scarce product, compared to non-scarce products. Hence, the subjective value of scarce products is evaluated higher in the evaluation stage of the decision-making process, than the subjective value of non-scarce products. Based on their first experiment Mittoni & Savadori concluded that this attractiveness depends on the bundle of products. This showed the existence of relative attractiveness based on the scarcity bias in the context of their experiment. Additionally, in their second experiment they showed that the participants' willingness to sell the product, the willingness to accept, increases if the product is presented as a scarce product. This conclusion also adds to their previous finding: scarcity creates attractiveness and thus increases the subjective value of consumers (Mittone & Savadori, 2009).

Another underlying motive for the use of scarcity in marketing lies in the commodity theory, introduced in section 2.1. Lynn (1991) build on this research, showing a significant scarcity effect for commodities. Lynn showed that perceived scarcity increases the perceived value of that commodity. Regarding people's underlying motive related to the need for uniqueness, Lynn found that there is a significant positive relationship between the need for uniqueness and the preference for scarce commodities (Lynn, 1991). Hence, scarcity appeals can be used to increase the perceived value of the product, when placing emphasis on the uniqueness that can be achieved by owning or consuming that product.

In several articles, further explanation for this preference for scarce products is given. Verhallen & Robben (1995) noted two reasons behind the attractiveness of scarce products. They called the first explanation "forbidden fruit is sweet". This means that unreachable products are preferred, simply because they are outside the capability of the individual. On the contrary, they also found that there is a phenomenon called "the sour grape", by which they actually mean the opposite: as a product becomes less available, the individual's preference for it is reduced. Hence, this implies frustration. Verhallen & Robben thus did not define a clear direction of the relationship, but they did show that there is a relationship between the availability of products and individual's preferences. After Verhallen & Robben, there has been more research dedicated to this subject. The first psychological explanation that John et. al (2018) gave was the "desire for uniqueness", which aligns with Brock (1968), Lynn (1991), Wu & Lee (2016) and Gierl & Huetll (2010). Individuals tend to prefer products that make them feel like they stand out from the general image. Their second explanation was the so called "fear of missing out". If the product is scarce, people will assign a higher subjective value to the product, because they do not want to miss out on the perceived exclusiveness of the product (Wu & Lee, 2016). Because of the research about the relationship between promotional tactics and scarcity, marketers use scarcity in their promotional messages. Scarcity appeals in advertising can thus lead to a higher perceived value, and hence have a positive effect on the individuals' intentions to purchase (Eisend, 2008).

Besides a higher perceived value, scarcity messages based on high demand can increase the individual's perception on the quality, without having to use the quality indicator function of the price. According to Stock & Balachander (2005) demand caused scarcity is more effective as a quality indicator is than simply increasing the price or the supply, because quality indicated by popularity is harder to copy for competitors than quality indicated by a high price. If a company were to increase the price as a quality signal, competitors with lower quality products could easily do the same, thus the quality indicator effect would be diminished.

To summarize, as mentioned in section 2.2, consumers tend to use evaluative criteria to compare the generated alternatives in the evaluation stage of the decision-making process. In this section, it was found that scarcity appeals are expected to influence the perceived value of individuals, which might thus influence the evaluation criterion of the value of the product. This led to the following hypothesis:

H6: The use of demand caused scarcity appeals increases the perceived value of the product.

Besides that, demand caused scarcity is expected to indicate a high quality, which is also used as an evaluative criterion. This quality indicator function of scarcity is desired, because its effect is greater than the quality indicator function of the price. This can be explained by the fact that quality indication due to scarcity is harder to copy for competitors than the price as an indicator for quality. Hence, the following hypothesis is formulated:

H7: The use of demand caused scarcity appeals increases the perceived quality of the product.

2.3.2 Risks and disadvantages

The use of quantity scarcity appeals does not merely have positive effects. A risk of using scarcity messages as a promotional tactic was briefly mentioned in section 2.3.1. Verhallen & Robben (1995) explained that unavailability, and thus scarcity, can create the 'sour grape' effect. This essentially means that individuals experience frustration related to the unavailable product, which causes a negative attitude towards it. This theory implies that scarcity appeals will decrease the attractiveness of the product, because of the frustration related to it (Verhallen & Robben, 1995). A reason for reversal of the scarcity effect has been looked for in previous research. Scarcity strategy could, when used various times, make consumers aware of the fact that they are being persuaded to decide, which is naturally not liked by humans. They want to feel like they are their own decisionmakers. In that case, the use of scarcity strategy, or more specific: Limited Editions, could have negative effects on the purchase intention of possible consumers (Friestad & Wright, 1994).

Kristofferson et. al. (2017) found that aggressive feelings among consumers can result from scarcity messages. This relationship between scarcity promotions and aggressive feelings mostly applied to non-necessity products (e.g. iPhones). In a follow-up study, they even found that scarcity appeals can increase physical aggressive behavior. The third study of this research concluded that one of the explanations for this (physically) aggressive behavior can be found in the increased testosterone levels, due to the quantity scarcity appeals. Other individuals are perceived as competitors in the buying process, so by increasing the testosterone levels in our body it prepares itself to face this competition. In essence, consumers start seeing other individuals as a threat to obtaining the quantity scarce product. An exception to the findings in this research is that the aggressive behavior and the

aggressive feelings do not apply to limited time scarcity messages (Kristofferson, McFerron, Morales, & Dahl, 2017).

To summarize, we see that the perceived competition between consumers, due to quantity scarcity appeals can create aggressive behavior and frustration, which could decrease the valuation of the product. These findings led to the following hypothesis:

H8: Perceived competition increases aggressive feelings towards other consumers.

2.4 Research hypotheses and conceptual research model

The findings from the previous sections show that there are many variables that affect the decision-making process of consumers. These variables have shown to be related to scarcity messages. This section summarizes the key findings from the previous sections with the corresponding formulated hypotheses.

One of the findings from the literature study is that a feeling of competition is expected when demand caused scarcity appeals are used. This competition is expected to influence the information search negatively, in terms of the time spent on the information search stage. The competition could also induce aggressive feelings or jealousy towards other consumers, as follows from section 2.3.2. Besides that, time pressure is created through limited time scarcity messages. This time pressure in turn could lead to impulsive purchases, which is expected to influence the time spent on the information search stage negatively. Another effect of the time pressure is the chance of post purchase regrets, because of the possible impulsive purchase due to time pressure.

Within the evaluation stage, perceived quality and perceived value tend to be important evaluation criteria. From the literature it follows that popularity of a product is associated with a high quality and a high perceived value. Since demand caused scarcity appeals address the popularity of products, this type of appeals is expected to have a positive influence on the perceived quality and the perceived value of the product. However, for any scarcity appeal to work well, it is important that the product is in the consumers' consideration set. Hence, scarcity appeals are expected to have a greater influence if a product is in the consideration set. These key findings are summarized into the following hypotheses:

H1: The use of demand caused scarcity appeals of a product increases the feeling of competition between consumers.

H2: The use of limited time scarcity appeals decreases the time spent on the information search stage.

H3: The use of demand caused scarcity appeals decreases the time spent on the external information search through perceived competition.

H4a: Limited time scarcity appeals increase the purchase intention to a greater extent if the product is in the consideration set.

H4b: Demand caused scarcity appeals increase the purchase intentions to a greater extent if the product is in the consideration set.

H5: The use of limited time scarcity appeals increases the feeling of post purchase regrets.

H6: The use of demand caused scarcity appeals increases the perceived value of the product.

H7: The use of demand caused scarcity appeals increases the perceived quality of the product.

H8: Perceived competition increases aggressive feelings towards other consumers.

The conceptual research model shown in Figure 1 gives an overview of the relationship between the different variables in the hypotheses.

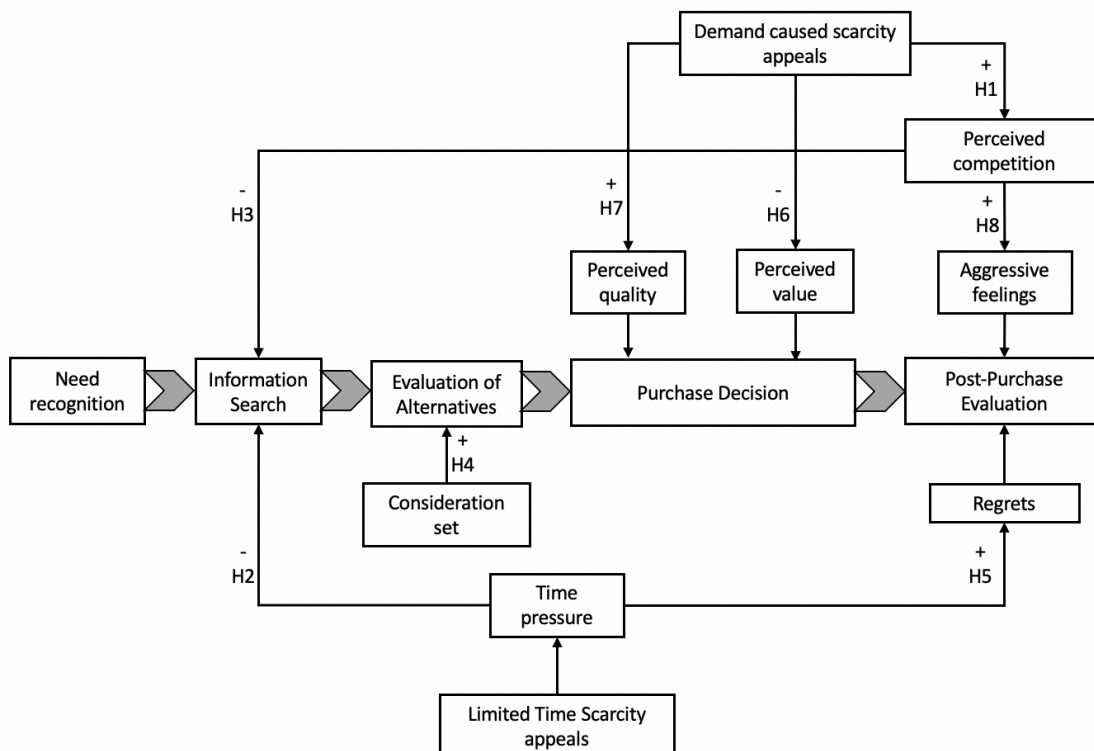


Figure 1. Conceptual research model

CHAPTER 3 RESEARCH METHODOLOGY

From the literature study in Chapter 2, eight hypotheses were generated. To answer the sub questions and the central research question, these hypotheses were investigated. This chapter elaborates on the methodology of this research. In the first section, the chosen research approach is explained. The second section elaborates on the data collection method. This is followed by the survey design. Section 3.4 describes the population and the corresponding sample, followed by section 3.5 in which the chosen type of statistical analysis per hypothesis is explained. The sixth and last section states the measures taken to prevent the researcher bias.

3.1 Research approach

One important choice in the research approach relates to the differences between qualitative and quantitative research. Steckler et. al. (1992) summarized the difference between quantitative and qualitative research into four main factors: deductive vs. inductive, objective vs. subjective measurement, reliable vs. valid, and generalizable vs. ungeneralizable. The deductive approach of quantitative research means that it focuses on verification and on the outcome, whereas qualitative, inductive, research focuses on the process and is meant for discovery (Steckler, McCormick, McLeroy, Goodman, & Bird, 1992). For this research a deductive research approach is most suitable compared to a qualitative, inductive approach, since the aim of this research is to investigate a possible relationship between scarcity appeals and the decision-making process of Dutch consumers. Another difference relevant for this research lies in the generalizability of the two approaches. In quantitative research, the outcome is based on the perspective of an outsider. The main goal is to verify in relation to a population, whereas qualitative research is focused on a more specific case or small group, where the outcome is created by the perspective of an insider (Steckler, McCormick, McLeroy, Goodman, & Bird, 1992). In other words, qualitative research is more suitable for in-depth understanding of a specific sample, whereas quantitative research applies statistical analysis to either reject or not reject a (null) hypothesis applicable to a larger population (Malhorta & Nunan, 2019). Since this research aims to provide answers which should be useful for a broader population than just the sample consumers, quantitative research suits this research more than qualitative research.

In this research, both desk research and field research are used. Desk research has been performed in Chapter 2, where a literature study helped to answer the theoretical sub questions listed in Chapter 1. In order to answer the empirical sub questions listed in section 1.3, field research is needed to verify the relationships shown in the conceptual research model in section 2.4. As explained in the last paragraph, quantitative research is used to do so, more specific: a survey has been chosen to perform the research. The survey design is further explained in section 3.3.

3.2 Data collection

To perform research, two main types of data can be used: primary and secondary data. The first, primary data, is data collected for the research. Hence, the data fits the research problem and did not necessarily exist beforehand. The second type, secondary data, reuses existing data. Hence, if primary data is collected for a specific research, this data adds to the existing data, which can be used as secondary data (Hox & Boeije, 2005). For this research, secondary data is used to perform the desk research in Chapter 2. However, to answer the empirical sub questions, primary data is collected through a survey, since primary data has a higher likelihood of fitting the research problem. Besides that, a survey is a convenient way to collect data, since the items are designed by the researcher and thus the data that results from it has a high probability to be relevant to the research problem.

To spread the survey fast and efficiently, an electronic survey is chosen, made with Qualtrics. This electronic survey was shared in the third week of January 2021, through various social media channels (Facebook, LinkedIn, WhatsApp), to reach a large enough sample to draw conclusions for the population. The target sample consists of a minimum of $n = 220$ respondents. To gain a representative sample in terms of both age, gender and educational level, the survey was sent to different groups. The first group was a student group of 100 students from the Erasmus School of Economics and one student group of 60 of the Leiden University, as well as to three high school groups: one from each level on January 23th of 2021. Besides that, the survey was spread on LinkedIn on 3 channels: one of a 22-year-old University student, one of a 52-year-old working male and one account of a 66-year-old, retired, female on the 27th of January 2021. A random sampling method is thus used, since the survey was sent to these different groups, without actually choosing the respondents. The survey was sent to approximately 1100 people. Since the desired response number was 220, the desired response rate was 20%. After conducting the survey, the actual number of complete responses suitable for the analysis was 238.

Because of the way the survey is spread, snowball sampling might be induced, even though this is not the desired sampling method. In a snowball sampling procedure with s stages and k individuals, the individuals in the sample are asked to give the researcher k other individuals who can join the sample. This is repeated until stage s is reached (Goodman, 1961). To prevent the sample from being a snowball sample, different starting points of spreading were used. For example, the survey was be posted in different WhatsApp groups accounts from various social groups, instead of just the researchers own WhatsApp groups and asking the people from one social group to share it on their own social media channels. Besides that, the survey was shared on three different starting accounts on LinkedIn.

3.3 Survey design

The landing page of the electronic survey shows a short explanation of the purpose of this research and a 'thank you in advance' note to the respondent, see Figure B1 in Appendix B. This short explanation does not contain specific information about the aim of the research. This information is kept from the respondents, to take away the influence that the detailed information might have on the response. This short explanation is in Dutch, because part of the sample from the target population of Dutch consumers might not speak English fluently. Hence, providing the survey in Dutch increases the response rate and creates a more accurate sample of the population. Besides that, providing the survey merely in English could cause misinterpretation of the questions for the target group of Dutch respondents. Within the choice for a survey, indirect or direct surveys can be used. A possible flaw of direct surveys is the risk of respondents not revealing their true answer. However, indirect surveys require various questions per subject, which increases the number of questions and thus the risk of fatigue effects (Hahsler & Reutterer, 2006). Hence, for this research a direct survey is used, to keep the number of questions low.

The actual survey was divided into two main parts: statements about various advertisements and questions about the respondent. The first part of the electronic survey directly addresses the two main influences on the decision-making process that we are trying to verify: limited time scarcity appeals, and demand caused scarcity appeals. Respondents are asked to rate the answer on a 5-point scale (strongly disagree, disagree, neutral, agree, strongly agree). A 7-point scale could increase the accuracy of the individual answers. However, a 5-point scale is expected to decrease the chance of fatigue effects towards the end of the survey (Rasmussen, 1989). The exact design of the survey is as follows. First, an advertisement is shown without any scarcity appeals: the neutral advertisement. Below this picture, the survey items are shown in the form of statements. The answers to the statements regarding the neutral advertisement are used to compare the effects of scarcity appeals with. The next page shows statements while showing the second advertisement, containing demand caused scarcity appeals. However, only the items related to H1, H3, H4, H6, H7 and H8 are asked. The third advertisement contains limited time scarcity appeals. The respondent is asked to answer the items related to the hypotheses regarding limited time scarcity messages: H2, H4 and H5. The items are placed in a different order per advertisement, to prevent respondents from consciously comparing their answers to their previous answers. However, the questions which are directly related to seeing the advertisement are placed on top, to make it easier for the respondent to look back at the advertisement.

The last page of the survey contains questions about the demographics of the respondent. In these questions, information about the gender, the age and the highest level of education and the

nationality of the respondent is gained. This is used to check the representativeness of the sample. These questions are placed at the end of the survey, to decrease the chance of people quitting the survey beforehand. Besides that, fatigue effects are unlikely to have a big effect on answering demographic questions about themselves, compared to answering items about the advertisements. More detailed information about the survey items can be found in Appendix B.

3.4 Research sample

This section lists information about the research sample and the relation to the target population. The target population of this research is Dutch consumers. This population is represented by the sample that follows from the data collection method explained in section 3.2. To collect a representative sample of this population, the desired sample size n was set to a minimum of 220 examples through random sampling. The questions about the demographics of the respondent were used to make sure the sample is representative for the population, based on these demographics. Since this research aims to investigate Dutch consumers, all other nationalities were removed from the sample. Besides that, missing values are noted if the response was incomplete.

As mentioned in section 3.3, the survey was made in Qualtrics and distributed through various social media channels and other electronic channels. The survey was conducted between January 22th and January 29th of 2021. After this period, the total amount of responses was 346. However, 101 responses were not completed, and these were therefore excluded from the analysis. The number of completed responses was 245. Missing values were noted as -99, so values of -99 were transformed into missing values. After reporting missing values and responses from non-Dutch consumers, the actual sample size n was 238. Hence, 238 examples are used to analyze the data in IBM SPSS Statistics 27.

Table 1

Demographics of the sample

Variable	Value	Label	Frequency	Percentage
Male	1	Male	89	37,4
	2	Female	149	62,6
Education	1	Elementary school	2	0,8
	2	VMBO/MAVO/HAVO	28	11,8
	3	VWO	13	5,5
	4	MBO	50	21,0
	5	HBO	92	38,7
	6	University Bachelor	35	14,7
	7	University Master	17	7,1
Age	1	<20 years old	19	8,0
	2	20-39 years old	105	44,1
	3	40-59 years old	84	35,3
	4	60-79 years old	29	12,2
	5	Older than 79 years	1	0,4

Table 1 gives an overview of the demographics of the sample. 89 of the 238 respondents (37,4%) answered the question about their gender with male. This means that 149 (62,6%) were female, since none of the respondents chose 'other' as their answer regarding the gender. In the Dutch population, the gender is uniformly distributed. Hence, the probability of a respondent being male should be close to 0.5 (CBS, 2021). However, Dutch consumers might to have a larger probability of being female, since females can be more likely to be interested in consuming. This is further discussed in the limitations of this research. The age group that was largest in the sample is the group of 20-39 years old (105 respondents, 44,1%) and the smallest age group in the sample is the group of >80 years old (1 respondent, 0.4%). Two of the respondents answered their highest education to be elementary school (0.8%). With 92 respondents (38,7%) choosing an HBO Bachelor, this was the largest group in the sample with regards to the highest level of education. An overview of all other descriptive statistics and frequencies of the questions about the demographics of the respondents are provided in Appendix C.

3.5 Analysis

As stated in section 3.1, this research is performed using quantitative methods. Therefore, the outcome of the survey is analyzed using a statistical computer program: SPSS. In this section, the data analysis methods are explained. For the analysis of the data, a within-subject comparison is made. This means that the samples are paired. Each item corresponds to one hypothesis. About the neutral advertisement, all questions are asked. The answers to these questions represent the control data. The questions are answered on a 5-point scale, making the dependent variable discrete and ordinal. On the other hand, the independent variable is a nominal value: either the treatment (one of the scarcity appeals), or no treatment (the neutral advertisement). To use a t-test, the data is assumed to have a normal distribution. Since this assumption for the t-test is violated (see Appendix C3), performing a t-test is not suitable to analyze this data. To perform statistical tests on ordinal data, the Mann-Whitney test could be a suitable test. This test is thus used to test hypothesis 4, which is explained in section 3.5.4. However, the largest part of the data consists of one sample, violating the assumption of independent samples.

The Kruskal-Wallis test is suitable for a nominal independent variable and an ordinal dependent variable. Hence, the data does not need to be normally distributed, nor do the samples have to be independent (Moore, McCabe, Alwan, & Craig, 2020). However, since this research compares only two groups, a Wilcoxon Matches Pairs test such as the Wilcoxon Signed Rank test is most suitable for most of the hypotheses, except for hypothesis 4. This test uses the smallest sum of the ranks as its test statistic, which is then normalized to a Z-statistic. Hence, if the sum of positive ranks is smaller than the sum of negative ranks, then the sum of positive ranks, W^+ , is used as the test statistic. In case of a smaller sum of negative ranks, W^- is used as the test statistic. All hypotheses are tested based on two (or more) of the variables that result from the data collection. A required significance level of 5% is used in all statistical tests in this research. The variables and their corresponding names are explained in Appendix C1 and the frequency histograms of all variables can be found in Appendix C3.

3.5.1 Hypothesis 1

The first hypothesis is tested based on the ConcST and ConcDCS variables. These are both ordinal variables with 5 values, representing the answers to the statement on the 5-point scale. The value 1 means strongly disagreeing with the statement and a value of 5 means that the respondent strongly agrees with the statement about the feeling of competition due to the advertisement. ConcSt captures the answer about the standard advertisement and ConcDCS captures the answer about the same statement, but when an advertisement with demand caused scarcity appeals is shown. As can

be taken from Figure C1 and Figure C2 in Appendix C, the data is not normally distributed over the 5 values of the ordinal variable. Hence, to test the first hypothesis which states that “the use of demand caused scarcity appeals of a product increases the feeling of competition between consumers”, a Wilcoxon Signed Rank test is performed. A Wilcoxon Signed Rank test tests whether the distribution of the data of the one group is systematically different than the data from the other group. Hence, the null hypothesis of this test is H_0 : the median of group 1 is the same as the median of group 2.

3.5.2 Hypothesis 2

The second hypothesis, which states that “the use of limited time scarcity appeals decreases the time spent on the information search”, is tested based on the InfoSt and InfoLTS. These are the same type of variables as ConcSt and ConcDCS: ordinal variables with values from 1 (strongly disagree) to 5 (strongly agree). The Info variables capture the answer to the statement saying that seeing the advertisement gives more information about the product. InfoSt captures the answer to this statement when a neutral advertisement is shown and InfoLTS captures the answer to the statement when the limited time scarcity appeals are shown. Figure C3 and Figure C4 in Appendix C do not show a normal distribution of the data. Therefore, the same test is performed as for testing the first hypothesis: a Wilcoxon Signed Rank test using SPSS.

3.5.3 Hypothesis 3

Testing the third hypothesis, which states that “demand caused scarcity appeals decrease the time spent on the information search through the perceived competition”, is based on the variables ConcInfoSt and ConcInfoDCS. The ConcInfo variables captures the answer to the statement saying that when other consumers feel like competitors for the purchase, they would spend less time searching for information. ConcInfoSt captures the answer to this statement about the neutral advertisement and ConcInfoDCS captures the answer when the demand caused scarcity appeals are shown. The data of these variables consists of five values, reaching from 1 (strongly disagree) to 5 (strongly agree). The answers of the respondents are not normally distributed over these values either, as can be taken from Figure C15 and Figure C16 in Appendix C3. Therefore, to test this hypothesis, a Wilcoxon Signed Rank test is performed.

3.5.4 Hypothesis 4

The fourth hypothesis, which states that “limited time scarcity appeals, and demand caused scarcity appeals influence the purchase intentions to a larger extent if the product is in the consideration set”, is tested performing a Mann-Whitney-U test using SPSS. Hypothesis 4 aims to verify

a relationship between the effect of the scarcity appeals and whether or not the product is within the consideration set. This hypothesis is split into two parts: H4a tests this relationship for limited time scarcity appeals. The goal is to verify whether the EffectLTS variable is significantly larger for people who answered the product to be in the consideration set (ConsiderationLTS = 'Yes'), than for those who answered 'no' (ConsiderationLTS = 'No') to the question related to the consideration set. In order to do so, the data is first split on ConsiderationLTS to compare the EffectLTS among the groups according to whether or not the product shown in the LTS advertisement is in the consideration set or not. As can be taken from the Tables C5-C7 in Appendix C, the distribution of EffectLTS seems to differ once the data is split on the ConsiderationLTS variable. Since an ordinal variable between two independent samples is compared (grouped by ConsiderationLTS), a Mann-Whitney-U test is performed to test the fourth hypothesis. The exact same procedure is followed to test hypothesis 4b, which examines the relationship between demand caused scarcity appeals and the product being in the consideration set. Hence, to group the data, ConsiderationDCS is used, and to examine the differences in the effect on the purchase intentions, EffectDCS is used for the Mann Whitney U-test. The distribution of the EffectDCS variable is shown in Table C8 (Appendix C) and the distribution after grouping on the ConsiderationDCS variable is shown in Table C9 and Table C10 (Appendix C).

3.5.5 Hypothesis 5

The fifth hypothesis, which states that “the use of limited time scarcity appeals increases the feeling of post-purchase regrets”, is tested based on RegretSt and RegretLTS. RegretSt captures the answer about post-purchase regrets when the neutral advertisement is shown and RegretLTS captures the answer to this statement when the limited time scarcity appeals are shown. These are both ordinal variables with unequal intervals and the variables are based on data from the same sample. As shown in Figure C11 and Figure C12 in Appendix C, the data of these two variables is not normally distributed. Hence, the statistical test performed to test the fifth hypothesis is the Wilcoxon Signed Rank test as well. If this statistical test shows a significant result, the null hypothesis of equal regret scores for both groups (neutral and limited time scarcity) cannot be accepted. Therefore, that would mean that feelings of regret are indeed larger in case of limited time scarcity appeals.

3.5.6 Hypothesis 6

The sixth hypothesis states that “the use of demand caused scarcity appeals increases the perceived value of the product”. This is tested based on the ValueSt and ValueDCS variables. Figure C13 and Figure C14 (Appendix C3) show that the data is not normally distributed over the five values and both variables are ordinal. ValueSt is a variable that captures the opinion about the perceived

value of the product in case of the standard advertisement, whereas ValueDCS captures the answer to this statement when demand caused scarcity appeals are shown. Both these variables consist of values between 1 (strongly disagree) and 5 (strongly agree). Since these variables are ordinal variables and the data is not normally distributed, a Wilcoxon Signed Rank test is performed to test the sixth hypothesis. In case of a statistically significant result, it cannot be concluded that the median of both variables is the same.

3.5.7 Hypothesis 7

To test hypothesis 7, which states that “the use of demand caused scarcity appeals increases the perceived quality of the product”, the same procedure as for hypothesis 6 is used, but based on the QualSt and the QualDCS variables. The QualDCS variable captures the perceived quality in case of a standard (neutral) advertisement and QualDCS captures the answer to this statement when the product is accompanied by demand caused scarcity appeals. As can be taken from Figure C17 and Figure C18 (Appendix C), the data is not normally distributed. Since, as mentioned earlier, the variables are ordinal, the Wilcoxon Signed Rank test is best suitable to test the seventh hypothesis.

3.5.8 Hypothesis 8

The last and eighth hypothesis states that “perceived competition increases aggressive feelings towards other consumers”. To test this hypothesis, two ordinal variables are used: AggrSt and AggrDCS, which capture the aggressive feelings experienced in case of a neutral advertisement and in case of a demand caused scarcity advertisement, respectively. As can be taken from Figure C19 and Figure C20, both these variables are not normally distributed. Hence, a t-test is not suitable for testing this hypothesis. Therefore, a Wilcoxon Signed Rank test is used to test the eighth hypothesis. In case of a statistically significant result, the null hypothesis of equal medians in both groups cannot be confirmed, which would mean that aggressive feelings indeed increase in case of demand caused scarcity appeals.

3.6 Researcher bias

Researcher bias occurs when the researcher adapts the data or information, in order to fit a desired outcome of the research. If this bias occurs, the outcome of the research can lose (part of) its value. Hence, to prevent the researcher bias from occurring in this research, various measures have been taken. As mentioned in section 3.1, quantitative research tends to use more objective measures than a qualitative research approach. Qualitative research requires more interpretation by the

Section 4

researcher, making the measurement more subjective. Hence, the choice for quantitative research is the first measure taken to prevent the researcher bias.

The survey distribution is another influence on the risk for a researcher bias. If the sample were not randomly selected, the researcher could select the sample based on the desired outcome. However, in this research the survey is widely spread and all complete responses from Dutch respondents are considered in the analysis. Besides that, the researcher chose to keep detailed information about the research objective and the central research question from the respondents. Only practical and general information is given at the start of the survey (see Appendix B1). This is a measure taken to prevent respondents from suffering from a response bias. A response bias occurs when respondents choose the answer they expect to be the most favorable answer for the research, instead of their own real answer.

CHAPTER 4 RESEARCH OUTCOME

This section elaborates on the research outcome, which follows from the research performed based on the methodology explained in Chapter 3. The first section addresses the findings from the raw survey data. The second section explains the outcomes from the statistical tests to verify the eight hypotheses formulated in Chapter 2. The last and third section summarizes the key findings and briefly compares this to the findings from the literature study in Chapter 2.

4.1 Raw survey data

From the frequency tables in Appendix C3, the frequencies that stand out the most are discussed in this section. The first comparison can be made for the ConcSt and ConcDCS variables. These variables captured the question about the experienced competition between consumers for the standard advertisement (ConcSt) and for the advertisement with demand caused scarcity appeals (ConcDCS). The competition experienced in case of a demand caused scarcity advertisement shows a high frequency in the value 4, whereas value 2 is the value with the highest frequency in the ConcSt variable, see Figure C2 and C3 (Appendix C). This means that for the competition experienced when an advertisement with demand caused scarcity appeals, most respondents answered 'agree' on feeling competition, whereas most respondents answered 'disagree' when the neutral advertisement was shown. Another noticeable high frequency is found in the value 2 ('disagree') in both the InfoSt and the InfoLTS variables. This means that both for the standard advertisement and for the advertisement with limited time scarcity appeals, respondents answered to 'disagree' with the statement about the level of information given through the advertisement. This is further discussed in the limitations of this research. For the remaining frequency histograms shown in Appendix C3 it can be noticed that the distribution of the standard advertisement and the advertisement with either demand caused scarcity appeals or limited time scarcity appeals do not seem to be normally distributed.

4.2 Hypothesis testing

The data was analyzed in SPSS, where all of the eight hypotheses were tested. This section describes the key findings and the statistical significance from the hypotheses testing. All statistics and SPSS output are shown in Appendix C4, and an overview of the most important statistical output is given in Table 2, Table 3 and Table 4 in this section.

Table 2

Test statistics of the Wilcoxon Signed Rank Test for H1, H2, H3

Hypothesis	Variables	Z-statistic	p-value (2-tailed)
H1	ConcDCS – ConcSt	-6.960 ^a	<.001 [*]
H2	InfoLTS - InfoSt	-4.847 ^a	<.001 [*]
H3	ConcInfo - ConcInfoSt	-0.580 ^a	0.562

* significant ($\alpha = 0.05$)

a. Based on the negative ranks

b. Based on the positive ranks

4.2.1 Hypothesis 1

To test the first hypothesis, which stated that the use of demand caused scarcity appeals increases the feeling of competition between consumers, SPSS was used to perform a Wilcoxon Signed Rank test. If the test shows that ConcDCS is significantly higher than ConcSt, the feeling of competition in case of advertisements with demand caused scarcity appeals is higher than in case of neutral advertisements. The Wilcoxon Signed Rank test comes with the null hypothesis of equal medians in both groups. As can be taken from Table 2, the Z-statistic based on the negative ranks is -6.960 and the p-value of the test is smaller than <0.001. Since the p-value of the test is two-tailed, it is divided by 2, to get the one-tailed p-value. This is smaller than our α of 5%, so there is not enough statistical evidence to infer that the null hypothesis is accepted. This means that the median of the feeling of competition in case of demand caused scarcity appeals is likely to be higher than in case of neutral advertisements. Therefore, it is found that Dutch consumers experience more competition in the decision-making process of a product, when the product is accompanied by demand caused scarcity appeals. The significant result of this statistical test means that the first hypothesis of this research, “the use of demand caused scarcity appeals of a product increases the feeling of competition between consumers”, is accepted.

4.2.2 Hypothesis 2

To test the second hypothesis, which stated that the use of limited time scarcity appeals decreases the time spent on the information search, SPSS was used to perform a Wilcoxon Signed Rank test on the InfoSt and the InfoLTS variables. If this test shows a significant result, the hypothesis of limited time scarcity appeals decreasing the time spent on the information search is accepted. The Wilcoxon Signed Rank test on the InfoSt and InfoLTS variables resulted in a Z-statistic of -4.847 based on the negative ranks, resulting in a two-tailed p-value < 0.001 (Table 2). Since our hypothesis requires a one-tailed test, this p-value is divided by two. This one-tailed p-value is smaller than our significance

level ($p\text{-value} < .001 < 0.05 < \alpha$), which means that there is not enough statistical evidence to infer that the null hypothesis of equal medians is accepted.

Hence, it is found that if a product is accompanied by limited time scarcity appeals, consumers spend less time on searching for information about this product. Section 2.2.2 showed that this decrease in the time spent on the information search can be traced back to the time pressure felt because of limited time scarcity appeals. This significant result means that the second hypothesis, “the use of limited time scarcity appeals decreases the time spent on the information search stage of Dutch consumers”, is accepted.

4.2.3 Hypothesis 3

To test the third hypothesis, which stated that perceived competition due to demand caused scarcity appeals decreases the time spent on the information search stage, a Wilcoxon Signed Rank test was performed using SPSS on the ConclInfoSt and the ConclInfoDCS variables. In case of a significant result of this test, demand caused scarcity appeals are likely to decrease the time spent on the information search stage through the perceived competition. The Wilcoxon Signed Rank test based on the data of ConclInfoSt and ConclInfoDCS results in a Z-statistic of 0.580 based on the negative ranks and a corresponding two-tailed p-value of 0.562 (see Table 2). Hence, there is not enough statistical evidence to reject the null hypothesis ($\text{one-tailed } p\text{-value} = 0.562/2 > 0.05 = \alpha$). This means that there is not enough statistical evidence to infer that perceived competition between consumers decreases the time spent on the information search stage. Hence, it cannot be confirmed that Dutch consumers spend less time on the information search stage if they experience competition due to demand caused scarcity appeals. Since the test does not show a significant difference, the third hypothesis of this research, “The use of demand caused scarcity appeals decreases the time spent on the external information search through perceived competition”, is rejected.

4.2.4 Hypothesis 4

To test the fourth hypothesis, which stated that scarcity appeals have a bigger influence on products within the consideration set, compared to products outside of the consideration set, a Mann-Whitney-U test is performed on the EffectLTS and the EffectDCS variables, which are respectively grouped by the ConsiderationLTS and the ConsiderationDCS variables.

Table 3

Test statistics of the Mann-Whitney-U test of H4

Variables	Z-statistic	p-value (2-tailed)
EffectLTS ^a	-7.356	<.001*
EffectDCS ^b	-8.197	<.001*

* significant ($\alpha = 0.05$)

a. Grouping variable: ConsiderationLTS

b. Grouping variable: ConsiderationDCS

The first part of the fourth hypothesis, Hypothesis 4a, stated that limited time scarcity appeals increase the purchase intentions to a greater extent if the product is in the consideration set. Hence, to test this hypothesis, it is tested whether the median of EffectLTS in the group where ConsiderationLTS = 'Yes' is higher than the median of EffectLTS in the group where ConsiderationLTS = 'No'. As can be taken from Table 3, this test results in a Z-value of -7.356 and a corresponding two-tailed p-value <.001. This means that there is not enough statistical evidence to infer that the null hypothesis of equal medians is accepted (one-tailed p-value $<.001/2 < 0.05 = \alpha$). Hence, the EffectLTS is likely to be higher in the group where ConsiderationLTS = 'Yes'. In terms of this research, this means that the effect of limited time scarcity appeals on the purchase intentions is higher if the product is in the consideration set. Therefore, hypothesis 4a is accepted.

The second part of the fourth hypothesis, Hypothesis 4b, stated that the effect of demand caused scarcity appeals on the purchase intentions is higher for products in the consideration set. This is tested by performing a Mann-Whitney-U test on the EffectDCS variable, grouped by the ConsiderationDCS variable. This test results in a Z-statistic of -8.197 and a corresponding two-tailed p-value <.001. Since the one-tailed p-value $<.001/2 < 0.05 = \alpha$, there is not enough statistical evidence to infer that the medians of the two groups are equal (see Table 3). Therefore, the median of EffectDCS is indeed higher in the group where ConsiderationDCS = 'Yes'. In terms of this research, this means that the effect of demand caused scarcity appeals is indeed higher if the product is within the consideration set of the consumer. Therefore, hypothesis 4b is also accepted.

This means that a product accompanied by scarcity appeals has a higher likelihood of being purchased by a Dutch consumer, if the product is in the consideration set: the set of brands that the consumer would actually consider buying. If the product is not in the consideration set, the scarcity appeals influence the purchase intentions less. The significant results of the statistical tests on Hypothesis 4a and Hypothesis 4b mean that the fourth hypothesis, which states that "scarcity appeals increase the purchase intentions to a greater extent if the product is in the consideration set", is accepted.

Table 4

Test statistics of the Wilcoxon Signed Rank Test for H5, H6, H7 and H8

Hypothesis	Variables	Z-statistic	p-value (2-tailed)
H5	RegretLTS - RegretSt	-.104 ^b	0.917
H6	ValueDCS - ValueSt	-6.601 ^a	<.001*
H7	QualDCS - QualSt	-4.699 ^a	<.001*
H8	AggrDCS - AggrSt	-4.680 ^a	<.001*

* significant ($\alpha = 0.05$)

a. Based on the negative ranks

b. Based on the positive ranks

4.2.5 Hypothesis 5

To test the fifth hypothesis, which states that the use of limited time scarcity appeals increases the feeling of post-purchase regrets, a Wilcoxon Signed Rank test was performed on the variables RegretSt and RegretLTS, using SPSS. If the test shows significant results, limited time scarcity appeals do indeed increase post-purchase regrets. The Wilcoxon Signed rank test resulted in a Z-statistic of -0.104 and a corresponding two-tailed p-value of 0.917 (see Table 4). This is the only Wilcoxon Signed Rank test in this research that is based on the positive ranks, which means that this is the only test for which the sum of the positive ranks was lower than the sum of the negative ranks. Since this test does not show a significant result (one-tailed p-value = $0.917/2 > 0.05 = \alpha$), there is not enough statistical evidence to reject the null hypothesis. Hence, a significant difference in the feeling of post-purchase regrets due to limited time scarcity appeals cannot be concluded. This means that for Dutch consumers, limited time scarcity appeals do not create regrets after purchasing the product. Based on the insignificant result of this statistical test, it is found that the fifth hypothesis, “the use of limited time scarcity appeals increases the feeling of post purchase regrets”, is rejected.

4.2.6 Hypothesis 6

To test the sixth hypothesis, which stated that the use of demand caused scarcity appeals increases the perceived value of the product, a Wilcoxon Signed Rank test was performed on the variables ValueSt and ValueDCS. A significant result of this test would mean that the perceived value indeed increases with the use of demand caused scarcity appeals. As can be taken from Table 4, the test gave a Z-statistic of -6.601 and a corresponding two-tailed p-value <.001. Hence, the test does not provide enough statistical evidence to infer that the null hypothesis of equal medians is accepted (one-tailed p-value < $0.001/2 < 0.05 = \alpha$). This means that the perceived value increases with the use of demand caused scarcity. Hence, if a product is accompanied by demand caused scarcity appeals, Dutch

consumers assign a higher value to the product than the value they give the product if demand caused scarcity appeals are not used. The result of this statistical test is significant. Therefore, it is concluded that the sixth hypothesis, “the use of demand caused scarcity appeals increases the perceived value of the product”, is accepted.

4.2.7 Hypothesis 7

To test the seventh hypothesis, stating that the use of demand caused scarcity appeals increases the perceived value of the product, a Wilcoxon Signed Rank test was performed on the QualSt and QualDCS variables. In case of a significant result of this test, it is likely that the perceived quality of a product for which demand caused scarcity appeals are used is higher than for a product with neutral advertisements. The Wilcoxon Signed Rank test resulted in a Z-statistic of -4.699, with a corresponding two-tailed p-value $<.001$, as can be taken from Table 2. Since the one-tailed p-value $<.001/2$ is smaller than the required significance level of 5% ($\alpha = 0.05$), there is not enough statistical evidence to state that the null hypothesis of equal medians in the two groups is accepted. It is thus found that Dutch consumers assign a higher quality to the product, if it is accompanied by demand caused scarcity appeals. Hence, demand caused scarcity appeals create a higher perceived quality for Dutch consumers than promotion without demand caused scarcity aspects. This significant result means that hypothesis 7, “the use of demand caused scarcity appeals increases the perceived quality of the product”, is accepted.

4.2.8 Hypothesis 8

To test the last and eighth hypothesis, which stated that perceived competition increases aggressive feelings towards other consumers, a Wilcoxon Signed Rank test was performed based on the AggrSt and the AggrDCS variables. A significant result would mean that aggressive feelings are likely to be higher in case of advertisements using demand caused scarcity appeals, compared to neutral advertisements. The test statistics resulting from this test are shown in Table 2. The Z-statistic is -4.680 and the corresponding two-tailed p-value $<.001$. Hence, since the one-tailed p-value is smaller than the required significance level, there is not enough statistical evidence to state that the medians of the two groups are equal ($p\text{-value } <.001/2 < 0.05 = \alpha$). Therefore, it is found that Dutch consumers experience more aggressive feelings, if they consider other consumers as competition for the purchase. This statistically significant result means that hypothesis 8, “Perceived competition increases aggressive feelings towards other consumers”, is accepted.

4.3 Key findings

The hypotheses that followed from the literature study have been analyzed in section 4.2, in order to answer the empirical research questions related to Dutch consumers. It followed that there are various influences on the decision-making process, which in turn seem to be activated and/or influenced through the use of scarcity appeals. An overview of the hypotheses and the corresponding result in terms of the hypothesis being accepted or rejected is shown in Table 5.

Table 5

Overview of the outcome of the hypothesis testing

	Hypothesis	Result
H1	The use of demand caused scarcity appeals of a product increases the feeling of competition between consumers.	Accepted
H2	The use of limited time scarcity appeals decreases the time spent on the information search stage.	Accepted
H3	The use of demand caused scarcity appeals decreases the time spent on the external information search through perceived competition.	Rejected
H4	Scarcity appeals increase the purchase intention to a greater extent if the product is in the consideration set.	Accepted
H5	The use of limited time scarcity appeals increases the feeling of post purchase regrets.	Rejected
H6	The use of demand caused scarcity appeals increases the perceived value of the product.	Accepted
H7	The use of demand caused scarcity appeals increases the perceived quality of the product.	Accepted
H8	Perceived competition increases aggressive feelings towards other consumers.	Accepted

Demand caused scarcity appeals are expected to induce a feeling of competition between consumers (H1). The analysis of Hypothesis 1 showed that for the target population of Dutch consumers, this hypothesis is accepted. Hence, it showed that Dutch consumers experience more competition towards other consumers, when the product is accompanied by demand caused scarcity appeals. Further investigating this led to the hypotheses that this competition induces two other effects: a decrease of the time spent on the information search (H3) and an increase in aggressive feelings towards other consumers (H8). There is no significant effect found of this competition on the time spent in the information search stage of Dutch consumers, since hypothesis 3 is rejected, based

on the analysis in section 4.3.3. The competition experienced due to demand caused scarcity appeals thus does not influence the time spent on the information search stage of Dutch consumers. The second effect of the competition: aggressive feelings towards other Dutch consumers, was examined by analyzing Hypothesis 8. This hypothesis is accepted for Dutch consumers, which means that individuals from the target population experience more aggressive feelings towards other consumers in case of demand caused scarcity appeals, compared to neutral advertisements. Another interesting influence that followed from the literature study was the positive effect that demand caused scarcity appeals had on the perceived value (H6) and the perceived quality (H7) of a product. The analysis of Hypothesis 6 showed that this hypothesis is accepted. This means that for Dutch consumers, demand caused scarcity appeals have a positive influence on the perceived value of a product. Besides that, Hypothesis 7 is also accepted. Hence, Dutch consumers consider the product to be of higher quality, when demand caused scarcity appeals are used to advertise this product.

Another type of scarcity was also found to influence the decision-making process: limited time scarcity appeals. These appeals create time pressure, which is expected to decrease the time spent on the information search (H2). Analyzing this relationship for the target population of Dutch consumers showed that this hypothesis is accepted. Therefore, it can be concluded that limited time scarcity appeals do indeed decrease the time spent on the information search stage of Dutch consumers. Besides this, limited time scarcity appeals are found to increase the chance of impulsive purchases and hence inducing post-purchase regrets. However, in this research regarding Dutch consumers, this hypothesis was rejected. Limited time scarcity appeals thus do not create post-purchase feeling of regret for Dutch consumers.

Hypothesis 4 examined a broader effect: the effect of scarcity appeals was expected to be higher for products within the consideration set. This hypothesis was split up into the two types of scarcity appeals: limited time scarcity appeals (H4a) and demand caused scarcity appeals (H4b). The first part of this hypothesis (H4a) was accepted, which means that limited time scarcity appeals have a greater influence on the purchase intentions of Dutch consumers for products that are in the consideration set, than for products outside of the consideration set. Hypothesis 4b examined the difference in the effect of demand caused scarcity appeals, between consumers who put the product in the consideration set and consumers who do not have it in their consideration set. This hypothesis was also accepted, which means that demand caused scarcity appeals do have a greater effect on the purchase intentions of Dutch consumers, for products that are in the considerations set, than for products outside of the consideration set. Hence, hypothesis 4 is accepted: scarcity appeals have a greater influence if the product is in the consideration set.

CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS

This section answers the central research question by summarizing and combining all findings from both the literature study and the field research. The first section states the key findings from the literature study and the field research and compares these to each other. Section 5.2 looks back at the hypotheses and answers the central research question formulated in Chapter 1. After that, both the marketing implications and the recommendations are given in section 5.3. This is followed by the limitations of this research, explained in section 5.4. The last section of this chapter, section 5.5, reflects on the process and states the lessons learned from performing this research.

5.1 Key findings

5.1.1 Literature study

The literature study showed that scarcity can be used as a marketing tool to influence the decision-making process. A study of Mittoni & Savadori (2009) showed that demand caused scarcity appeals could increase the perceived value of the product accompanied by those appeals. A product is scarce when the demand is greater than the supply, which is emphasized using demand caused scarcity appeals. Hence, their explanation for this effect was the feeling of competition between consumers for purchasing that product, possibly due to the expectation that the product has an intangible feature. The second stage of the decision-making process, the information search, is also found to be influenced by scarcity appeals. Especially in terms of the time spent on this information search, both limited time scarcity appeals, and demand caused scarcity appeals are found to decrease the time spent on the external information search. On the one hand, the aforementioned competition induces the feeling that the product has an intangible feature. This serves as a piece of information, decreasing the time spent on the external information search (Mittone & Savadori, 2009). On the other hand, limited time scarcity appeals create time pressure, which is also found to decrease the time spent on the external information search (Schmidt & Spreng, 1996). Hence, both limited time scarcity appeals, and demand caused scarcity appeals are found to decrease the time spent on the external information search stage.

Moving on to the next stage of the decision-making process, the evaluation of alternatives, it was found that this stage is highly influenced by the different (mental) sets a brand/product can be in. For marketing, it is relevant that the product moves into the evoked set: all brands of which the consumer expects it to actually fulfill their needs. However, within this set, there is a more specific set of products/brands: all brands/products that the consumer would actually consider buying. Marketing tools are thus expected to have a greater influence on the products within the consideration set.

Applying this to the current research: scarcity appeals are found to influence the purchase intentions more, if the product is in the consideration set.

To work well as a marketing tool, the tool should enhance the evaluative criteria of the product it promotes. Eisend (2008) found that scarcity appeals influence the perceived value, and Wu & Lee (2016) added to this, with the finding that people do not want to miss out on the perceived exclusiveness of the product, which can be traced back to the intangible feature expected due to demand caused scarcity appeals (Mittone & Savadori, 2009). Hence, demand caused scarcity appeals are found to increase the perceived value of a product. Another important evaluative criterium in the alternative evaluation is the quality of a product. Stock & Balachander (2005) found that consumers assign a higher quality to the product if demand caused scarcity appeals are used. To summarize, both the perceived value and the perceived quality of a product increase if a product is accompanied by demand caused scarcity appeals.

The evaluation leads to an actual choice, which is followed by the outcome of the choice: the post-purchase evaluation. This assesses the extent to which the purchase fulfills the pre-purchase expectations. In case of a disconfirmation paradigm, the actual performance of the product (the post-purchase experience) differs from the pre-purchase expectations. A negative difference could lead to regrets of the purchase. Abendroth & Diehl (2006) found that scarcity messages increase the chance of impulsive purchases. This is in line with the aforementioned effect of less time being spent on external information search if a product is accompanied by limited time scarcity appeals (Schmidt & Spreng, 1996). Hence, limited time scarcity appeals are found to increase the chance of post-purchase regrets, because of the time pressure.

Scarcity appeals do not merely have positive effects. Verhallen & Robben (1995) found that unavailability, a type of scarcity, could induce a so-called 'sour grape' effect: frustration due to the unavailability or even aggressive feelings towards other consumers, since they are seen as competition for the purchase. Hence, the aforementioned competition due to demand caused scarcity is found to induce aggressive feelings towards other consumers.

5.1.2 Field research

The field research tested the eight hypotheses generated from the literature study, applied to Dutch consumers. The first type of scarcity appeals researched was the effect of demand caused scarcity appeals on the different stages in the decision-making process of Dutch consumers. From the field research it followed that Dutch consumers do indeed experience more competition for a purchase, if the product is accompanied by demand caused scarcity appeals. Furthermore, this competition is found to induce frustration and aggressive or jealous feelings towards other consumers.

The feeling of competition and aggression is not the only effect that demand caused scarcity appeals turned out to have on the decision-making process of Dutch consumers. In the evaluation stage, two of the evaluative criteria are the perceived value and the perceived quality. The field research showed that both of these criteria are evaluated higher, if the product is promoted by demand caused scarcity appeals. Therefore, it is found that Dutch consumers assign both a higher value and a higher quality to a product accompanied by demand caused scarcity appeals.

The second relationship researched was the effect of limited time scarcity appeals on the decision-making process of Dutch consumers. With regards to this type, it was found that limited time scarcity appeals decrease the time spent on the external information search of Dutch consumers, due to the time pressure experienced. The time pressure due to these appeals was expected to increase the feeling of post-purchase regrets. However, this research cannot confirm that relationship: Dutch consumers do not show more post-purchase regrets for a product if it is accompanied by limited time scarcity appeals.

Investigating whether the influence of scarcity appeals was dependent on the product being in the consideration set or not led to the finding that both demand caused scarcity appeals and limited time scarcity appeals increase the purchase intention to a larger extent if the product is in the consideration set. The sample was split into two groups: respondents who actually considers buying the displayed product and respondents who indicated that the product is not in the consideration set. It turned out that the purchase intentions increased more due to the scarcity appeals for Dutch consumers who indicated that the product was in their consideration set.

5.1.3 Differences and similarities

The literature study led to the eight hypotheses that were applied to and verified for Dutch consumers in the field research. As mentioned in the sections above, six of these hypotheses were accepted for Dutch consumers: Hypotheses 1, 2, 4, 6, 7 and 8 are accepted. As stated in section 4.2 and 4.3, hypothesis 3 and hypothesis 5 were rejected. These were not confirmed for the target population of Dutch consumers. In the literature study it was found that competition is a feeling that can be induced due to demand caused scarcity appeals. This was formulated in Hypothesis 1, which was confirmed for Dutch consumers. The theory and previous research showed that this competition would induce the feeling that the product has an intangible feature, which would provide the consumer with some information. Literature showed that this would decrease the time spent on the information search, which led to Hypothesis 3. However, applied to Dutch consumers, it cannot be confirmed that competition serves as a mediating variable for demand caused scarcity appeals decreasing the time spent on the external information search. The time a Dutch consumer spent in the

information stage did not show significant differences between the product accompanied by a neutral advertisement and the product accompanied by demand caused scarcity appeals.

Another important difference between the literature study and the field research can be seen when looking at the post purchase regrets (H5). As followed from the literature study, limited time scarcity appeals create time pressure, which is considered as a 'cost' in the information search stage. Hence, it was confirmed that the information search stage was shortened in case of limited time scarcity appeals (H2). Previous research showed that this time pressure would lead to impulsive purchases. This was expected to enlarge post-purchase regrets, which led to Hypothesis 5. However, the research performed on Dutch consumers does not confirm this relationship. Dutch consumers do not show more post-purchase regrets for the product accompanied by limited time scarcity appeals, compared to the product accompanied by a neutral advertisement.

5.2 Central research question and hypotheses

The central research question, as formulated in Chapter 1, was as follows:

“To what extent does the use of limited time scarcity appeals, and demand caused scarcity appeals influence the decision-making process of Dutch consumers?”

In this research, secondary data was used to perform a literature study and primary data was collected to verify the findings from the literature study and apply them to the target population of Dutch consumers, through a survey. The literature study showed that the main direct effects of demand caused scarcity appeals were: a feeling of competition between consumers (H1), a higher perceived value (H6) and a higher perceived quality of the product (H7). The perceived competition due to demand caused scarcity appeals in turn served as a mediating effect for aggressive feelings towards other consumers (H8) and a decrease in the time spent on the external information search (H3). The second type, limited time scarcity appeals, was found to influence the decision-making process through the created time pressure in the following ways: a decrease in the time spent on the information search stage (H2) and an increase in post purchase regrets (H5). Besides that, it was found that the mental position of the product was important for the extent to which these two scarcity appeals influence the purchase intentions. If the product was mentally positioned in the consideration set of a consumer, marketing tools such as scarcity appeals were expected to have a greater influence (H4).

Applied to Dutch consumers, this research showed that the information search stage of the decision-making process of Dutch consumers is influenced by limited time scarcity appeals, through

the created time pressure (H2). Demand caused scarcity appeals induce a feeling of competition between consumers (H1). However, this does not lead to a decrease of the time spent on the information search for Dutch consumers (H3). In the stage where alternatives are evaluated, both types of scarcity appeals are found to influence the purchase intentions to a greater extent if the product is mentally positioned in the consideration set (H4). After generating alternatives, the evaluation stage and hence the product choice is also influenced by scarcity appeals. In this stage evaluative criteria, such as the perceived value and the quality are used. A higher score is assigned to both of these evaluative criteria in case of demand caused scarcity appeals. Hence, demand caused scarcity appeals influence the evaluation stage by leading to an increase in the perceived value of the product (H6) as well as a higher perceived quality of the product accompanied by the appeals (H7). However, the valuation of the product does not merely increase due to the use of scarcity appeals. This research showed that aggressive feelings can be induced through the experienced competition (H8). Another expected effect in the post-purchase evaluation stage was an increase in post-purchase regrets if the product was accompanied by limited time scarcity appeals (H5), because these appeals might cause impulsive purchases. However, this effect was not confirmed for Dutch consumers.

To summarize, the most important findings are that for Dutch consumers (1) limited time scarcity appeals decrease the time spent on the information search stage, (2) the use of demand caused scarcity appeals induces a feeling of competition between consumers which can lead to aggressive feelings and that (3) the use of demand caused scarcity appeals increases the perceived value and the perceived quality in the evaluation stage. Besides that, it is found that (4) scarcity appeals influence the purchase intentions more if the product is in the consideration set during the generation of alternatives in the decision-making process of a Dutch consumer.

5.3 Recommendations

5.3.1 Recommendations to companies

Previous research already stressed the importance of the consideration set. From this research, it follows as well, that for scarcity appeals to work best, marketers need to spend time figuring out how to move the product they want to promote into the consideration set of the target group. Since scarcity appeals have a greater influence on products in the consideration set, it would be a waste of resources to spend time on developing marketing campaigns with scarcity appeals, if the brand is not yet in the consideration set of the target group. This research provides marketers with information about the use of limited time scarcity appeals. It was found that limited time scarcity appeals are of great influence on the information search stage. The use of LTS appeals decreases the time spent on the information stage. Therefore, if marketers aim to influence the information search

stage and speed up the decision-making process through this, they should use limited time scarcity appeals. Impulsive purchases are found not to create post-purchase regrets, so based on this research there is no reason to take measures to prevent post-purchase regrets, as the risk of a bad attitude against the brand is not increased due to these possible regrets.

Besides that, this research provides marketers with information about the effects of demand caused scarcity appeals. This type of scarcity appeals is, as followed from the field research, best applicable to Dutch consumers in the evaluation stage. In the evaluation stage, demand caused scarcity appeals help to increase the perceived value and the perceived quality that Dutch consumers assign to the product. Hence, emphasizing the popularity, possibly due to an intangible feature, will help promote a product and influence the behavior of Dutch consumers in the evaluation stage. However, when using demand caused scarcity appeals to promote a product, it is important to keep in mind that competition between the Dutch consumers might arise, which is found to induce jealousy and aggressive feelings towards other consumers.

5.3.2 Recommendations to future researchers

This research focused on the use of demand caused scarcity appeals and limited time scarcity appeals and the effect that these types of scarcity appeals have on the decision-making process of Dutch consumers. However, as listed in section 2, there are a lot more types that should be researched in order to create the perfect combination of scarcity appeals throughout the whole decision-making process. This research, as mentioned in section 5.3.1, came to the marketing implications for influencing the information search stage and the evaluation stage. Future research should investigate the effect of using other types of scarcity appeals, to give a complete guideline for which type should be used to influence the different other stages of the decision-making process. Besides that, this research did not distinguish in demographics. Future research should be performed to distinguish and clarify the effects that scarcity appeals have in different demographic groups. For example, younger people could be more sensitive to demand caused scarcity appeals than adults, due to the 'Fear of Missing Out' (see section 2.3) being larger in this age group. Hence, this type of demographics and the difference in the effect that scarcity appeals have on the decision-making process of different age groups should be further investigated, in order to apply this to the different demographic groups that marketers tend to target.

5.4 Research limitations

This research performed both a literature study and field research. However, the field research and its statistical tests are based on a sample with size $n = 238$. This is a limitation of this research,

since the target population of Dutch consumers is very large compared to this sample. Performing the research with a larger sample would increase both the validity and the reliability of this research. Another limitation related to the sample is the overrepresentation of females: 62%. In the Dutch population, the division of male/female is approximately 50/50, while this sample consists of 2/3 females and 1/3 males. Furthermore, the field research collected data through a survey. Because the survey had a within-subject design, the number of questions was already large, even though only one question was asked per hypothesis. The outcome of the hypothesis testing was thus based on the answers of only one question, with two variables, making the outcome of the hypothesis overly dependent on these variables. The validity of the research would thus have been improved if several similar questions per hypothesis would have been asked, and then using and combining the answers to these questions to test the hypothesis. In order to maintain a low enough number of questions to prevent fatigue effects from occurring, the survey design could be changed to a between-subject design. Hence, three groups would be needed: one control group, to which a neutral advertisement is shown and two treatment groups (limited time scarcity appeals, and demand caused scarcity appeals). This does however require a larger sample group than used in this sample, which is why a within-subject design was used in this research.

5.5 Reflection

Even though this research is mainly performed in relation to my Bachelor's thesis, it taught me a lot more. Of course, diving into the subjects of both the decision-making process and the use of scarcity appeals gave me a lot of insights in these subjects. However, this has not been the only lesson learned. This research started as merely an idea about the subject that I wanted to research: scarcity strategy. However, as I got further into the process, it got more specific. In the beginning stages, I tended to panic quite a lot about it not being a structured process and well-defined subject. However, performing this research and experiencing the growth of it, while doing it, has taught me that research is not something that can be done fast, quick and easy. It is a long process and it is always in the back of your mind, but in the end, I truly believe that this long process makes the research how it is now.

Appendix

Appendix A Bibliography

- Aaker, D. A., & Shansby, J. G. (1982). Positioning your product. *Business Horizons*, 56-62.
- Abendroth, L. J., & Diehl, K. (2006). Now or never: effects of limited purchase opportunities on patterns of regret over time. *Journal of Consumer research*, 33, 342-352.
- Aggerwal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity messages: a Consumer Competition Perspective. *Journal of Advertising*, 40(3), 19-30.
- Amaldoss, W., & Jain, S. (2005). Conspicuous Consumption and Sophisticated Thinking. *Management Science*, 55(10), 1449-1466.
- Baack, D. W., Harris, E. G., & Baack, D. (2013). In *International Marketing* (pp. 114-170). Sage Publications Inc.
- Balachander, S., & Stock, A. (2009). Limited Editions: When and when not to offer them. *Marketing Science*, 28(2), 336-355.
- Balachander, S., Liu, Y., & Stock, A. (2009). An Empirical Analysis of Scarcity Strategies in the Automobile industry. *Management Science*, 55(10), 1623-1637.
- Brannon, L. A., & Brock, T. C. (2001). Scarcity claims elicit extreme responding to persuasive messages: role of cognitive elaboration. *Personality and social psychology bulletin*, 27(3), 365-375.
- Brock, T. C. (1968). Implications of commodity theory for value change. *Psychological foundations of attitudes*, 243-275.
- CBS. (2021, 01 15). *cbs.nl*. Retrieved from Bevolkingspiramide: <https://www.cbs.nl/nl-nl/visualisaties/bevolkingspiramide>
- Chae, H., Kim, S., Lee, J., & Park, K. (2019). Impact of product characteristics of limited edition shoes on perceived value, brand trust, and purchase intention. *Journal of Business Research*.
- DeGraba, P. (1995). Buying Frenzies and Seller-Induced excess demand. *The Rand Journal of Economics*, 26(2), 331-342.
- Ding, J., Lu, Q., & Ge, J. (2015). The Effect of Promotion Benefit Level on Patronage Intention in Limited-quantity Promotion: A Consumer Perceived Availability Perspective. *International Journal of Service, Science and Technology*, 12(8), 349-358.
- Eisend, M. (2008). Explaining the impact of scarcity appeals in advertising. *Journal of Advertising*, 37(3), 33-49.
- Friestad, M., & Wright, P. (1994). The persuasion knowledge model: how people cope with persuasion attempts. *Journal of Consumer Research*, 21(1), 1-31.

- Gierl, H., & Huettl, V. (2010). Are scarce products always more attractive? The interaction of different scarcity signals with products' suitability for conspicuous consumption. *International Journal of Research in Marketing*, pp. 225-235.
- Goodman, L. A. (1961, March). Snowball Sampling. *The Annals of Mathematical Statistics*, 32(1), 148-170.
- Hahsler, M., & Reutterer, T. (2006, February). A Review of Methods for Measuring Willingness-to-Pay. *Innovative Marketing*.
- Hox, J. J., & Boeije, H. R. (2005). Data Collection: Primary vs. Secondary. *Encyclopedia of Social Measurement*, 1, 593-600.
- John, M., Melis, A. P., Read, D., Rossano, F., & Tomasello, M. (2018). The preference for scarcity: a developmental and comparative perspective. *Psychology & Marketing*, 35(8), 603-615.
- Kristofferson, K., McFerron, B., Morales, A. C., & Dahl, D. W. (2017). The Dark Side of Scarcity Promotions: How Exposure to Limited-Quantity Promotions Can Induce Aggression. *Journal of Economic Research*, 43, 638-703.
- Lindsay-Mullikin, J., & Petty, R. D. (2011). Marketing tactics discouraging price search: deception and competition. *Journal of Business Research*, 64(1), 67-73.
- Lynn, M. (1991). Scarcity effects on value: A Quantitative Review of the Commodity Theory Literature. *Cornell University, School of Hospitality Administration*. Retrieved May 2020, from Cornell University, School of Hospitality Administration site: <http://scholarship.sha.cornell.edu/articles/179>
- Lynn, M. (1992). Scarcity's enhancement of Desirability: the role of naive economic theories. *Basic and applied social psychology*, 13(1), 67-78.
- Lynn, Michael. (1989). Scarcity effects on desirability: mediated by assumed expensiveness. *Journal of Economic Psychology*, 10, 257-274.
- Malhorta, N. K., & Nunan, D. (2019). 7. London: Pearson Education Limited.
- Marriner, A. (1977, Feb). The decision making process. *Supervisor nurse*, 8(2), pp. 62-66.
- Mittone, L., & Savadori, L. (2009). The Scarcity Bias. *Applied Psychology: an international review*, 59(3), 453-468.
- Moore, D. S., McCabe, G. P., Alwan, L., & Craig, B. (2020). In *The Practice of Statistics for Business and Economics* (Vol. 4th edition). New York: Freeman.
- Narayana, C. L., & Markin, R. J. (1975). Consumer Behavior and Product Performance: An Alternative Conceptualization. *Journal of Marketing*, 39(4), 1-6.
- Rasmussen, J. L. (1989). Analysis of Likert-Scale data. *Psychological Bulletin*, 105(1), 167-170.

Section 4

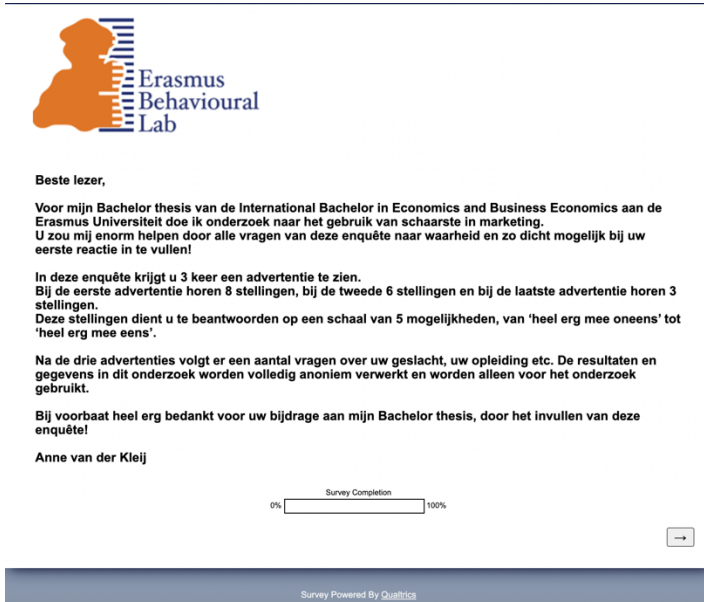
- Schmidt, J. B., & Spreng, R. A. (1996). A Proposed Model of External Consumer Information Search. *Journal of Academy of Marketing Science*, 24(3), 246-256.
- Steckler, A., McCormick, L., McLeroy, K. R., Goodman, R. M., & Bird, S. T. (1992). Toward Integrating Qualitative and Quantitative Methods: an introduction. *Health Education Quarterly*, 19(1), 1-8.
- Stock, A., & Balachander, S. (2005). The Making of a "Hot Product": a Signaling Explanation of Marketers' Scarcity Strategy. *Management Science*, 51(8), 1181-1192.
- Szmigin, I., & Piacentini, M. (2018). Consumer Behaviour. 100-110. Oxford: Oxford University Press.
- Takemura, K., & Selart, M. (2007). Decision making with information search constraints: a process tracing study. *Behaviormetrica*, 34(2), 111-130.
- Verhallen, T. (1982). Scarcity and consumer choice behaviour. *Journal of Economic Psychology*, 2, 299-322.
- Verhallen, T. M., & Robben, H. S. (1995). Unavailability and the Evaluation of Goods. *KYKLOS*, 48(3), 369-387.
- Vogt, C., & Fesenmaier, D. (1998). Expanding the functional informational search model. *Annals of Tourism research*, 25(3), 551-578.
- Worchel, S., Lee, J., & Adewole, A. (1975). Effects of Supply and Demand on Ratings of Object Value. *Journal of Personality and Social Psychology*, 32, 906-914.
- Wu, L., & Lee, C. (2016). Limited Edition for Me and Best Seller for You: the impact of scarcity versus popularity cues on self versus other-purchase behaviour. *Journal of Retailing*, 92(4), 486-499.

Appendix B Survey

B1 Landing page

The survey was spread through this Qualtrics link, which led to the landing page shown in Figure B1:

https://erasmusuniversity.eu.qualtrics.com/jfe2/form/SV_2sfAVSkV0MpKWTr



Erasmus Behavioural Lab

Beste lezer,

Voor mijn Bachelor thesis van de International Bachelor in Economics and Business Economics aan de Erasmus Universiteit doe ik onderzoek naar het gebruik van schaarste in marketing. U zou mij enorm helpen door alle vragen van deze enquête naar waarheid en zo dicht mogelijk bij uw eerste reactie in te vullen!

In deze enquête krijgt u 3 keer een advertentie te zien. Bij de eerste advertentie horen 8 stellingen, bij de tweede 6 stellingen en bij de laatste advertentie horen 3 stellingen. Deze stellingen dient u te beantwoorden op een schaal van 5 mogelijkheden, van 'heel erg mee oneens' tot 'heel erg mee eens'.

Na de drie advertenties volgt er een aantal vragen over uw geslacht, uw opleiding etc. De resultaten en gegevens in dit onderzoek worden volledig anoniem verwerkt en worden alleen voor het onderzoek gebruikt.

Bij voorbaat heel erg bedankt voor uw bijdrage aan mijn Bachelor thesis, door het invullen van deze enquête!

Anne van der Kleij

Survey Completion 0% 100%

Survey Powered By Qualtrics

Figure B1 Landing page of the electronic survey (Qualtrics)

B2 Survey questions

Page 2



Stelling 1: Deze **standaard** advertentie geeft mij het gevoel dat andere mensen concurrenten zijn voor deze aankoop.

Stelling 2: Door deze **standaard** advertentie heb ik het gevoel dat ik informatie krijg over het product.

Vraag: Zou u het product uit de **standaard** advertentie daadwerkelijk aan kunnen schaffen?

- a. Ja
- b. Nee

Stelling 3: Door deze **standaard** advertentie ben ik meer geneigd om het product aan te schaffen.

Stelling 4: Als ik het product uit de **standaard** advertentie aanschaf, dan verwacht ik dat ik hier na de aankoop spijt van zal krijgen.

Stelling 5: Ik schat de waarde van het product uit deze **standaard** advertentie hoog in.

Stelling 6: Als ik concurrentie voel, dan zal ik minder tijd kwijt zijn aan het zoeken naar informatie over het product uit deze **standaard** advertentie.

Section 4

Stelling 7: Ik schat de kwaliteit van het product uit deze **standaard** advertentie hoog in.

Stelling 8: Als ik concurrentie voel voor de aankoop van het product uit deze '**standaard**' advertentie, dan veroorzaakt dit jaloezie tegenover anderen.

Page 3



Stelling 1: Deze '**populair en bijna uitverkocht**' advertentie geeft mij het gevoel dat andere mensen concurrenten zijn voor deze aankoop.

Vraag: Zou u het product uit de '**populair en bijna uitverkocht**' advertentie daadwerkelijk aan kunnen schaffen?

- a. Ja
- b. Nee

Stelling 2: Door deze '**populair en bijna uitverkocht**' advertentie ben ik meer geneigd om het product aan te schaffen.

Stelling 3: Als ik concurrentie voel, dan zal ik minder tijd kwijt zijn aan het zoeken naar informatie over het product uit de '**populair en bijna uitverkocht**' advertentie.

Stelling 4: Ik schat de waarde van het product uit deze '**populair en bijna uitverkocht**' advertentie hoog in.

Stelling 5: Als ik concurrentie voel voor de aankoop van het product uit deze '**populair en bijna uitverkocht**' advertentie, dan veroorzaakt dit jaloezie tegenover anderen.

Stelling 6: Ik schat de kwaliteit van het product uit de '**populair en bijna uitverkocht**' advertentie hoog in.

Page 4



Stelling 1: Door deze '**bepaalde tijd beschikbaar**' advertentie heb ik het gevoel dat ik informatie krijg over het product.

Vraag: Zou u het product uit deze '**bepaalde tijd beschikbaar**' advertentie daadwerkelijk aan kunnen schaffen?

- 1. Ja
- 2. Nee

Section 4

Stelling 2: Door deze '**bepaalde tijd beschikbaar**' advertentie, ben ik meer geneigd om het product aan te schaffen.

Stelling 3: Als ik het product uit deze '**bepaalde tijd beschikbaar**' advertentie aanschaf, dan verwacht ik dat ik hier na de aankoop spijt van zal krijgen.

Page 5

Hier volgen een aantal vragen over uzelf, deze vragen worden anoniem verwerkt!

Vraag: Hoe identificeert u uzelf?

1. Man
2. Vrouw
3. Anders

Vraag: Wat is uw leeftijd?

1. Jonger dan 20
2. 20-39
3. 40-59
4. 60-79
5. 80 of ouder

Vraag: Wat is uw hoogst genoten opleidingsniveau?

1. Basisonderwijs
2. VMBO/MAVO/HAVO
3. VWO
4. MBO
5. HBO
6. WO Bachelor
7. WO Master

Section 4

B3 Raw Survey Data

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1	2	2	2	2	3	2	2	2	2	2	2	2	4	2	2	2	2	2	2	4	1	2	7	1
1	1	1	2	1	4	2	2	3	1	1	1	2	2	3	1	3	2	1	2	2	2	4	3	1
1	1	2	1	3	2	3	2	1	1	1	2	1	1	1	1	1	1	2	1	2	2	4	3	1
1	1	1	2	1	1	1	1	4	2	4	2	4	4	4	2	4	4	2	2	4	2	4	4	1
1	3	2	2	2	4	2	4	3	3	2	1	3	3	3	2	3	2	1	3	3	2	3	4	1
1	2	2	2	2	3	2	3	2	3	2	2	2	2	2	2	2	2	2	2	2	1	4	1	1
1	3	2	2	2	4	2	3	1	1	1	2	1	1	1	1	1	1	2	1	4	1	4	5	1

Appendix C Data Analysis

C1 Variables in SPSS input

The first category of variables in the SPSS input are seventeen ordinal variables based on the answers to the statements where 1 denotes totally disagree and 5 denotes totally agree:

- ConcSt: Deze standaard advertentie geeft mij het gevoel dat andere mensen concurrenten zijn voor deze aankoop.
- ConcDCS: Deze 'populair en bijna uitverkocht' advertentie geeft mij het gevoel dat andere mensen concurrenten zijn voor deze aankoop.
- InfoSt: Door deze standaard advertentie heb ik het gevoel dat ik informatie krijg over het product.
- InfoLTS: Door deze 'beperkte tijd beschikbaar' advertentie heb ik het gevoel dat ik informatie krijg over het product.
- EffectSt: Door deze standaard advertentie ben ik meer geneigd om het product aan te schaffen.
- EffectDCS: Door deze 'populair en bijna uitverkocht' advertentie ben ik meer geneigd om het product aan te schaffen.
- EffectLTS: Door deze 'beperkte tijd beschikbaar' advertentie, ben ik meer geneigd om het product aan te schaffen.
- RegretSt: Als ik het product uit de standaard advertentie aanschaf, dan verwacht ik dat ik hier na de aankoop spijt van zal krijgen.
- RegretLTS: Als ik het product uit deze 'beperkte tijd beschikbaar' advertentie aanschaf, dan verwacht ik dat ik hier na de aankoop spijt van zal krijgen.
- ValueSt: Ik schat de waarde van het product uit deze standaard advertentie hoog in.
- ValueDCS: Ik schat de waarde van het product uit deze 'populair en bijna uitverkocht' advertentie hoog in.
- ConclInfoSt: Als ik concurrentie voel, dan zal ik minder tijd kwijt zijn aan het zoeken naar informatie over het product uit deze standaard advertentie.
- ConclInfoDCS: Als ik concurrentie voel, dan zal ik minder tijd kwijt zijn aan het zoeken naar informatie over het product uit de 'populair en bijna uitverkocht' advertentie.
- QualSt: Ik schat de kwaliteit van het product uit deze standaard advertentie hoog in.
- QualDCS: Ik schat de kwaliteit van het product uit de 'populair en bijna uitverkocht' advertentie hoog in.
- AggrSt: Als ik concurrentie voel voor de aankoop van het product uit deze 'standaard' advertentie, dan veroorzaakt dit jaloezie tegenover anderen.

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- AggrDCS: Als ik concurrentie voel voor de aankoop van het product uit deze 'populair en bijna uitverkocht' advertentie, dan veroorzaakt dit jaloezie tegenover anderen.

Binary variables:

- ConsiderationSt: Zou u het product uit de standaard advertentie daadwerkelijk aan kunnen schaffen?
0. No
1. Yes
- ConsiderationDCS: Zou u het product uit de 'populair en bijna uitverkocht' advertentie daadwerkelijk aan kunnen schaffen?
0. No
1. Yes
- ConsiderationLTS: Zou u het product uit deze 'beperkte tijd beschikbaar' advertentie daadwerkelijk aan kunnen schaffen?
0. No
1. Yes
- Male: Hoe identificeert u uzelf?
0. Female
1. Male
- Dutch: Bent u een Nederlandse consument?
0. No
1. Yes

Ordinal variable with equal intervals

- Age: wat is uw leeftijd?
1. <20
2. 20-39
3. 40-59
4. 60-79
5. >79

Ordinal demographic variable with unequal intervals

- Education: Wat is uw hoogst genoten opleidingsniveau?
1. Basisonderwijs (elementary school)

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2. VMBO/MAVO/HAVO (low Dutch high school levels)
3. VWO (high Dutch high school level)
4. MBO (low level of Dutch college)
5. HBO (high level of Dutch college)
6. WO Bachelor (University Bachelor)
7. WO Master (University Master)

C2 Demographics of the sample

Table C1

Descriptive statistics of the demographics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Male	238	0	1	.37	.485
Age	238	1	5	2.53	.825
Education	238	1	8	4.60	1.392
Valid N (listwise)	238				

Table C3

Frequency table of 'Education'

Education				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1	2	.8	.8	.8
2	28	11.8	11.8	12.6
3	13	5.5	5.5	18.1
4	50	21.0	21.0	39.1
5	92	38.7	38.7	77.7
6	35	14.7	14.7	92.4
7	17	7.1	7.1	99.6
8	1	.4	.4	100.0
Total	238	100.0	100.0	

Table C2

Frequency table of 'Male'

Male					
	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid 0	149	62.6	62.6	62.6	
1	89	37.4	37.4	100.0	
Total	238	100.0	100.0		

Table C4

Frequency table of 'Age'

Age					
	Frequency	Percent	Valid Percent	Cumulative Percent	
Valid 1	19	8.0	8.0	8.0	
2	105	44.1	44.1	52.1	
3	84	35.3	35.3	87.4	
4	29	12.2	12.2	99.6	
5	1	.4	.4	100.0	
Total	238	100.0	100.0		

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C3 Frequency histograms ordinal variables

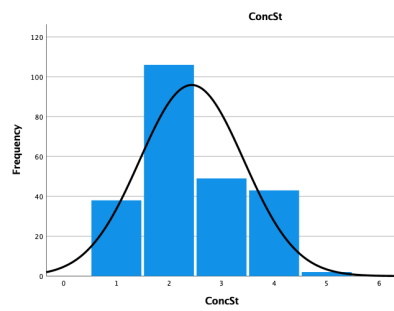


Figure C1 Frequency histogram of ConcSt.

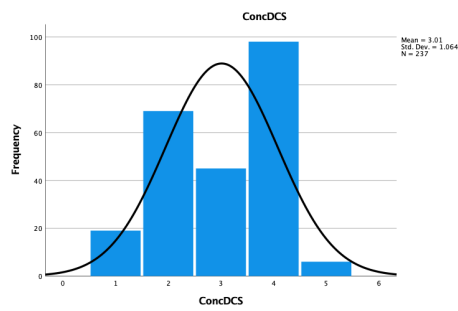


Figure C2 Frequency histogram of ConcDCS

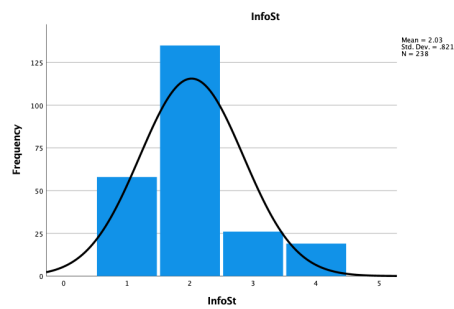


Figure C3 Frequency histogram of InfoSt

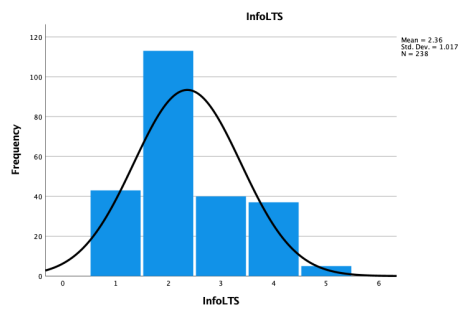


Figure C4 Frequency histogram of InfoLTS

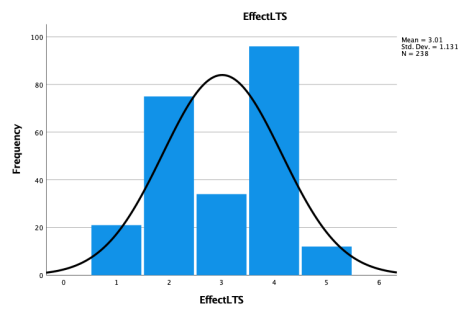


Figure C5 Frequency histogram of EffectLTS

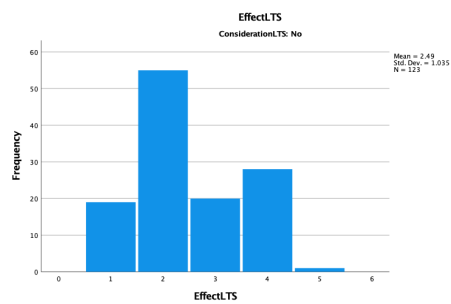


Figure C6 Frequency histogram of EffectLTS if ConsiderationLTS = No

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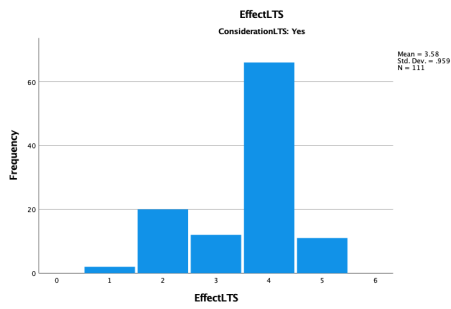


Figure C7 Frequency histogram of EffectLTS *if* ConsiderationLTS = Yes

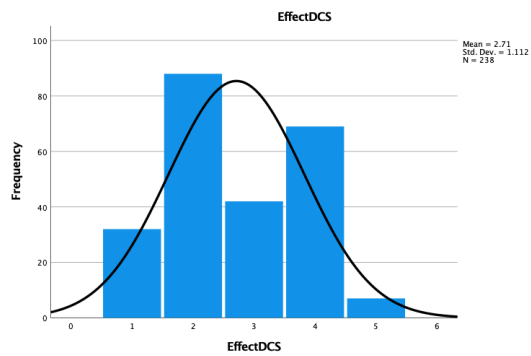


Figure C8 Frequency histogram of EffectDCS

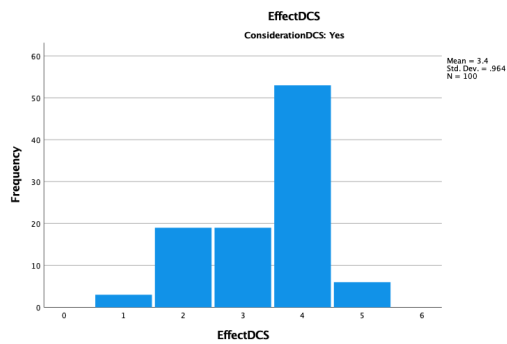


Figure C9 Frequency histogram of EffectDCS *if* ConsiderationDCS = Yes

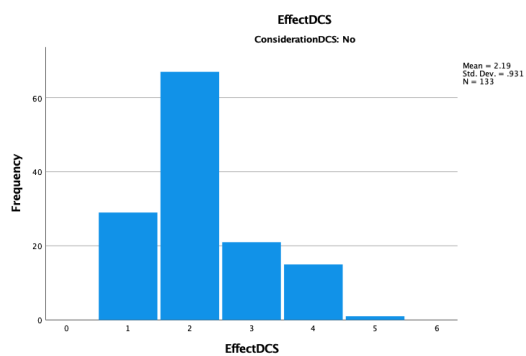


Figure C10 Frequency histogram of EffectDCS *if* ConsiderationDCS = No

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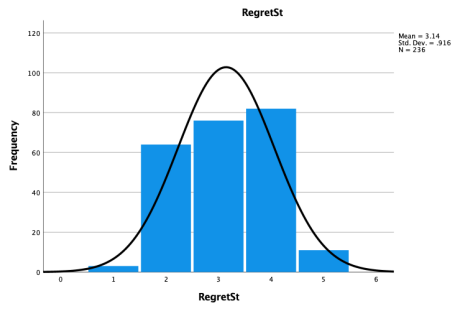


Figure C11 Frequency histogram of RegretSt

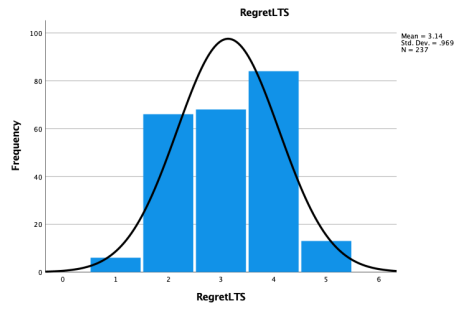


Figure C12 Frequency histogram of RegretLTS

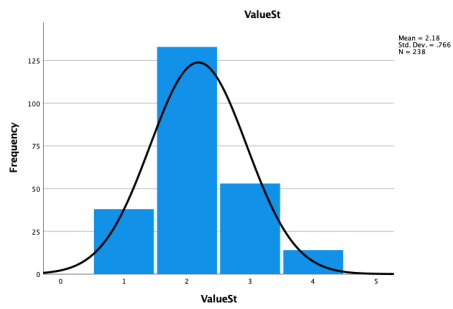


Figure C13 Frequency histogram of ValueSt

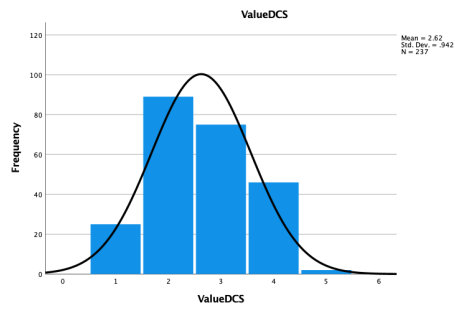


Figure C14 Frequency histogram of ValueDCS

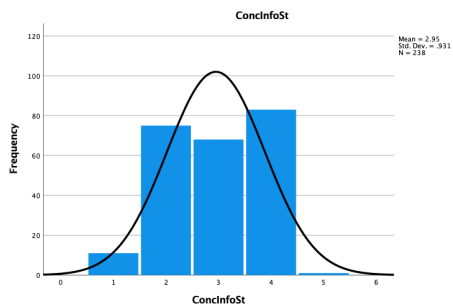


Figure C15 Frequency histogram of ConcInfoSt

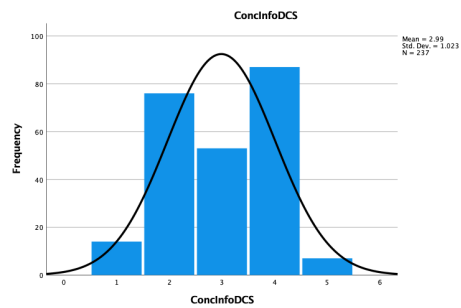


Figure C16 Frequency histogram of ConcInfoDCS

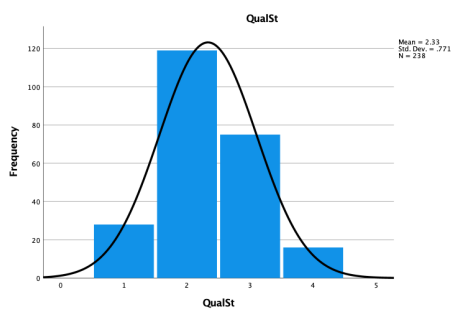


Figure C17 Frequency histogram of QualSt

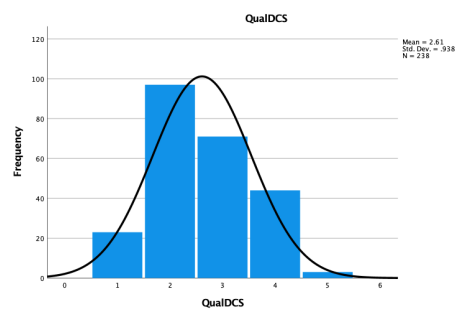


Figure C18 Frequency histogram of QualDCS

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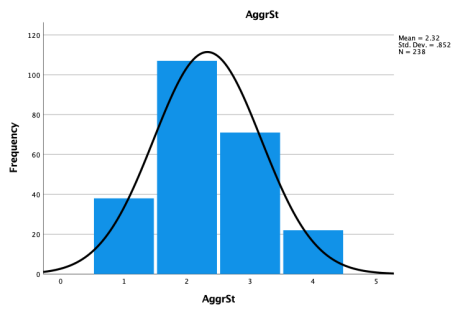


Figure C19 Frequency histogram of AggrSt

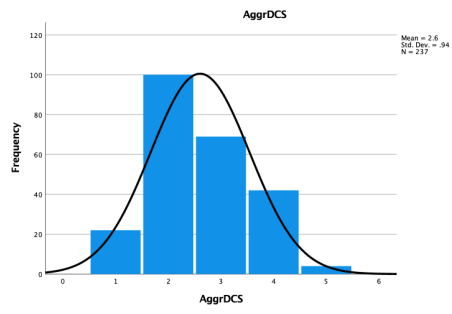


Figure C20 Frequency histogram of AggrDCS

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C4 Statistical tests

Table C5

Descriptive statistics of the variables used for the Wilcoxon Signed Rank test

Descriptive Statistics					
	N	Mean	Std. Deviation	Minimum	Maximum
ConcSt	238	2.43	.990	1	5
InfoSt	238	2.03	.821	1	4
ConcInfoSt	238	2.95	.931	1	5
RegretSt	236	3.14	.916	1	5
ValueSt	238	2.18	.766	1	4
QualSt	238	2.33	.771	1	4
AggrSt	238	2.32	.852	1	4
ConcDCS	237	3.01	1.064	1	5
InfoLTS	238	2.36	1.017	1	5
ConcInfoDCS	237	2.99	1.023	1	5
RegretLTS	237	3.14	.969	1	5
ValueDCS	237	2.62	.942	1	5
QualDCS	238	2.61	.938	1	5
AggrDCS	237	2.60	.940	1	5

Table C6

Ranks of the Wilcoxon Signed Rank tests H1, H2, H3, H5, H6, H7 and H8

Ranks				
		N	Mean Rank	Sum of Ranks
ConcDCS – ConcSt	Negative Ranks	29 ^a	61.95	1796.50
	Positive Ranks	114 ^b	74.56	8499.50
	Ties	94 ^c		
	Total	237		
InfoLTS – InfoSt	Negative Ranks	29 ^d	51.34	1489.00
	Positive Ranks	81 ^e	56.99	4616.00
	Ties	128 ^f		
	Total	238		
ConcInfoDCS – ConcInfoSt	Negative Ranks	49 ^g	51.19	2508.50
	Positive Ranks	54 ^h	52.73	2847.50
	Ties	134 ⁱ		
	Total	237		
RegretLTS – RegretSt	Negative Ranks	58 ^j	65.35	3790.50
	Positive Ranks	64 ^k	58.01	3712.50
	Ties	113 ^l		
	Total	235		
ValueDCS – ValueSt	Negative Ranks	23 ^m	49.61	1141.00
	Positive Ranks	94 ⁿ	61.30	5762.00
	Ties	120 ^o		
	Total	237		
QualDCS – QualSt	Negative Ranks	31 ^p	40.63	1259.50
	Positive Ranks	70 ^q	55.59	3891.50
	Ties	137 ^r		
	Total	238		
AggrDCS – AggrSt	Negative Ranks	31 ^s	47.27	1465.50
	Positive Ranks	76 ^t	56.74	4312.50
	Ties	130 ^u		
	Total	237		

a. ConcDCS < ConcSt

b. ConcDCS > ConcSt

c. ConcDCS = ConcSt

d. InfoLTS < InfoSt

e. InfoLTS > InfoSt

f. InfoLTS = InfoSt

g. ConcInfoDCS < ConcInfoSt

h. ConcInfoDCS > ConcInfoSt

i. ConcInfoDCS = ConcInfoSt

j. RegretLTS < RegretSt

k. RegretLTS > RegretSt

l. RegretLTS = RegretSt

m. ValueDCS < ValueSt

n. ValueDCS > ValueSt

o. ValueDCS = ValueSt

p. QualDCS < QualSt

q. QualDCS > QualSt

r. QualDCS = QualSt

s. AggrDCS < AggrSt

t. AggrDCS > AggrSt

u. AggrDCS = AggrSt

Section 4

Table C7

Test Statistics Wilcoxon Signed Rank Test H1, H2, H3, H5, H6, H7 and H8

Test Statistics ^a							
	ConcDCS – ConcSt	InfoLTS – InfoSt	ConcInfoDCS – ConcInfoSt	RegretLTS – RegretSt	ValueDCS – ValueSt	QualDCS – QualSt	AggrDCS – AggrSt
Z	-6.960 ^b	-4.847 ^b	-.580 ^b	-.104 ^c	-6.601 ^b	-4.699 ^b	-4.680 ^b
Asymp. Sig. (2-tailed)	<.001	<.001	.562	.917	<.001	<.001	<.001

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

c. Based on positive ranks.

Table C8

Ranks Mann-Whitney-U test H4a

Ranks				
	ConsiderationLTS	N	Mean Rank	Sum of Ranks
EffectLTS	Yes	111	149.99	16648.50
	No	123	88.18	10846.50
	Total	234		

Table C9

Test statistics Mann-Whitney-U test H4a

Test Statistics ^a	
	EffectLTS
Mann-Whitney U	3220.500
Wilcoxon W	10846.500
Z	-7.356
Asymp. Sig. (2-tailed)	<.001

a. Grouping Variable:
ConsiderationLTS

Table C10

Ranks Mann-Whitney-U test H4b

Ranks				
	ConsiderationDCS	N	Mean Rank	Sum of Ranks
EffectDCS	Yes	100	156.98	15698.00
	No	133	86.94	11563.00
	Total	233		

Table C11

Test statistics Mann-Whitney-U test H4b

Test Statistics ^a	
	EffectDCS
Mann-Whitney U	2652.000
Wilcoxon W	11563.000
Z	-8.197
Asymp. Sig. (2-tailed)	<.001

a. Grouping Variable:
ConsiderationDCS