GRA 19502

Master Thesis

Scarcity as a marketing instrument: The roles of goal frames and perceived consumer competition.

Navn:	Nghia Quang Pham, Juan Carlos Lopez

Name: **Nghia Quang Pham**
Juan Carlos López Muñoz

Hand-in date:
26.08.2017

Programme:
Master of Science in Strategic Marketing Management

ACKNOWLEDGMENTS

First, we would like to thank our thesis supervisor, Professor Rutger Daniel van Oest, for his incredible support and valuable suggestions throughout the writing process of this master thesis. He constantly motivated us to develop our own ideas and kept us on the right track. All of these supports mean a lot to us and give us such a rewarding experience on doing research.

Second, we are really grateful to the company Norway Shop for their kind collaboration by letting us to access to their database to perform the first experiment for this project.

Finally, the master thesis marked the end of our Master of Science in Strategic Marketing Management at BI Norwegian Business School. It was two years of hard work and dedication, which could not be accomplished without love from our family and friends. We would like to give a big thanks to all of them.

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

List of tables

List of figures

ABSTRACT

Purpose: This master thesis has three main objectives. The first aim is to investigate the influence of scarcity appeals on consumer purchase behaviors. The second aim is to investigate the moderator effect of goal frames (gain goal, hedonic goal and normative goal) on the relationship between scarcity appeals and consumer purchase intention. The third objective is to explore the mediating effect of consumer perceived competition on the link between the scarcity appeals and consumer purchase intention.

Scope: This research is based on a field experiment with a sample of 13,780 users in collaboration with the company Norwayshop, and two survey based experiments with a sample of 220 respondents.

Findings: The results reveal important findings that will contribute to the marketing literature. This research shows that demand-based scarcity has both a direct effect on consumer purchase intention and an indirect effect through perceived consumer competition on purchase intention. On the other hand, although supply-based scarcity shows an insignificant direct effect on purchase intention, it shows a significant indirect effect on purchase intention through perceived consumer competition.

At the same time, the study provides evidence that there exists an interaction effect between goal frame messages and scarcity appeals on purchase intention. There are some particular combinations between scarcity appeals and goal frames which generate a higher consumer purchase intention than others. The findings conclude the following combinations to be the best to achieve higher purchase intention: (1) demand-based scarcity message with a gain goal message; (2) demand-based scarcity message with a normative goal message; (3) supply-based scarcity message with a hedonic goal message.

Last, the findings show an insignificant interaction effect between demand-based scarcity and supply-based scarcity on perceived consumer competition. However, the results still show that combining demand-based scarcity and supply-based scarcity generates higher purchase intention compared with other scarcity conditions.

Contribution: This research, unlike prior studies, examines the effect of different types of scarcity appeals separately as well as the interaction effect between them. In addition, the study uncovered the role of goal frames and perceived consumer competition in the relationship between scarcity appeals and customer purchase behaviors. It is also the first time in the scarcity field to test the effect of scarcity appeals in a field setting by collaborating with an e-commerce company.

1. INTRODUCTION

Nowadays, consumers are exposed to an increasing number of products and offers. This trend bears numerous challenges for marketers in making their product stand out in direct competition with other products in the category. Hence, a crucial question now is how marketers can make their products appear more attractive in customers' mind, to draw more attention and generate a positive purchase behavior. A possible solution for this issue is to use a psychological effect, obeying the rule that "opportunities seems to be more valuable to us when their availability is limited" (Cialdini 1984). Scarcity has become an important marketing instrument in order to make customers perceive offers more favorable.

Scarcity appeals are among the most widely-used marketing strategies in advertising and promotion in mass media channels, which account for one fifth (20.3%) of the retail advertisements in newspapers (Howard et al. 2007). Furthermore, Fritchie and Johnson (2003) found that the priority order of preference for persuasion messages used in TV advertising is social proof (35.5%), followed by scarcity (28.4%), authority (18.4%), commitment and consistency (9.1%), liking (6.1%) and reciprocation (2%).

Scarcity has been shown to have a positive effect on customers' perception in rating product's quality (Worchel, Lee and Adewole 1975). Worchel et al. (1975) found in their study that compared with the abundant condition, participants rate the cookies much better in the scarcity condition. In other words, the scarcity condition makes participants perceive cookies more valuable and attractive. This finding is promising for marketers, because they can use scarcity effects to increase customers' purchase intention, since an offer's value increase under the scarcity condition. This effect leads us to the first research question:

Research question 1: Do scarcity messages influence customers' purchase behavior?

Over the past few years, ecommerce has been blooming rapidly, which opens a new way for marketers to communicate scarcity messages to customers. With e-commerce, marketers can use the scarcity technique in a diversity of ways. It is very popular in e-commerce to use more than one message of scarcity concurrently. For example, customers can see scarcity messages from demand side, for example, "high demand", "booked 67 times today" and from supply side, for example, "only 5 rooms available" in one offer in some booking sites. Our

paper aims to clarify whether different scarcity messages can interact with each other to create a bigger positive effect on customers' purchase behavior in order to justify the marketers' tactic. There does not seem to be any evidence on previous scarcity research that investigates the joint effect of different scarcity types on purchase intention, which leads to our second research question:

Research question 2: Do the effects of scarcity messages from demand side and supply side interact with each other when being included simultaneously?

Next, if there is an interaction effect between different types of scarcity messages, then we aim to find what generates this effect. To what we know, scarcity messages from both demand and supply side will bring us the information about competition among buyers. Competition occurs when high demand meets relatively limited supply. Hence, competition among buyers plays an important role in explaining the effect of scarcity messages on purchase behavior.

Furthermore, Kim (2006) suggested that customer motivation and goal orientation determine the responses to scarcity appeals as a persuasion attempt (Cialdini 1984). In other words, responses to scarcity messages are distinct in correspondence with different types of customer motivation. We argue that in order to achieve the best positive effect of scarcity messages on purchase behavior, we have to find the right type of customer motivation for each type of scarcity messages. From those above arguments, we suggest the third research question:

Research question 3: Is the relationship between scarcity messages and purchase behavior affected by customer motivation and mediated by perceived consumer competition among buyers?

The next chapters will provide the literature review, theoretical framework, methodology, results and discussion. First, the literature review will illustrate important gaps in the current literature regarding scarcity effects. Second, the theoretical framework present six hypotheses based on supporting theories as well as previous findings. The methodology chapter presents the stimuli, data collection, measurement and detailed procedure. The results section will provide the findings and will show which hypotheses are supported. Lastly, the discussion part will provide the theoretical and managerial implications based on the findings and discuss limitations and further research.

2. LITERATURE REVIEW

The scarcity effect is a powerful social-influenced phenomenon, used by marketers as a mean to increase the subjective desirability of products (Cialdini 1993; Jung and Kellaris 2004). Thus, scarcity is a popular concept in consumer behavior research. Although a great deal of research on scarcity effect has been done, they still showed some limitations and important literature gaps.

2.1 Scarcity

To the best of our knowledge, no official definition for scarcity is given by academic institutes such as the American Marketing Association (AMA). The literature provides different definitions of scarcity that we summarize in Table 1.

Table 1: Scarcity definition summary

Author (Year)	Term	Definition
Cialdini (1984)	Limited-number scarcity tactic	"When the customer is informed that a certain product is in short supply that cannot be guaranteed to last for long"
Cialdini (1984)	Deadline scarcity tactic	"In which some official time limit is placed on the customer`s opportunity to get what the compliance professional is offering"
Gierl, Plantsch, and Schweidler (2008)	Quantity scarcity	Possible consequence of changes in demand or supply
Stevenson (2010) "Oxford English Dictionary"	Scarcity	"The state of being scarce or in short supply; shortage"

For the purpose of this study, we use the definition from Oruc (2015). Hence, "scarcity is a condition or message that communicates a certain or potential unavailability of a product in the future along with the availability of a product in the present, all of which are directed at all possible recipients of a product". This

definition clarifies all the restrictions of scarcity in the marketing field. Product scarcity is a potential unavailability of the offer in the future, not in the present. The message or condition concerning product scarcity is not only limited to a group of customers but to all possible recipients. Thus, our chosen definition separates scarcity messages from messages for one specific group of customers such as loyalty programs for VIP customers. Moreover, the scarcity message is not limited to its cause by time, supplier's tactic or high demand; it can be a result of all these causes.

2.2   Supply-based scarcity vs demand-based scarcity

Researchers have categorized scarcity into different types with significant variations in name and definition. The scarcity classification is summarized in Table 2.

Taking all definitions into consideration, the categorization of scarcity messages is based on the reason and cause of that scarcity. Because scarcity is a circumstance controlled by demand and supply conditions, it can arise from both the demand and the supply side. In general, scarcity can be divided into two big categories: *Limited-time scarcity* and *limited-quantity scarcity*.

Limited-quantity scarcity can be divided into *supply-side scarcity* and *demand-side scarcity*. However, *time-limited scarcity* which is defined as the offer is made available for a predefined period (Cialdini 2009) is actually a scarcity tactic employed by marketers and vendors.

Because of this, we classify *time-limited scarcity* into *supply-side scarcity* and we focus our research on two types of scarcity messages: *supply-side scarcity* and *demand-side scarcity*. Specifically, *supply-side scarcity* arises from supply chain management. For example, *supply-side scarcity* can arise from shortage of raw materials, limited production capacity or corporate strategy (Van Herpen et al. 2005). Marketers have a partial or full control of *supply-side scarcity*. On the other side, *demand-side scarcity* arises from high demand and is controlled by consumers. For example, *demand-side scarcity* can arise from high sales volume and speculative buying, etc. (Van Herpen et al. 2005).

For the purpose of this study, we use the term *"demand-based scarcity"* which can be defined as the scarcity arising from demand side due to the number of

6

people who are interested in acquiring or already purchased a specific product (Gupta 2013; Gierl et al. 2008; Ku et al. 2012; Van Herpen et al. 2005). Demand-based scarcity messages can be in form of, for example, number of people watching the product or number of people who bought the product today. Hereby, we use the term *"supply-based scarcity"* which is defined as scarcity that arises from suppliers' decision through the communication to potential customers of limited number of units of product (Cialdini 2008; Gupta 2013; Gierl et al. 2008; Ku et al. 2012; Van Herpen et al. 2005). It can be, for example, "Only 5 units available at this price".

Our study will focus on quantity scarcity, that includes both demand-based scarcity and supply-based scarcity. From these two types of scarcity, we argue that there are three main ways of scarcity communication which can be employed by marketers. They can be pure demand-based scarcity (E.g., "Almost out of stock due to 100 purchases made today"), pure supply-based scarcity (E.g., "Only 50 units available at that special price) or supply/demand-based scarcity together (E.g., "Only 50 units left at this price and 100 purchases made today").

The literature has shown the positive effect of both demand-based and supply-based scarcity messages on purchase behavior. More specifically, the two types of scarcity messages show a positive effect on purchase intention (Ku et al. 2012), impulse buying (Gupta 2013; Kim 2014; Li 1995) and product attitude (Gierl et al. 2010). However, to our knowledge, no research has investigated the interaction effect of demand-based and supply-based scarcity on customers' purchase behavior. Hence, we aim to contribute to the literature by looking at the interaction effect of these two different scarcity messages on purchase intention.

Table 2: Classification of scarcity message

Author	Scarcity		
	Limited-time scarcity	Limited-quantity scarcity	
		Supply Scarcity	Demand Scarcity
Cialdini (2009)	The offer is made available for a predefined period, after which the offer becomes unavailable.	Retailer deliberately controls the supply of a predefined quantity of the product in the marketplace.	
Gierl et al. (2009)	Scarcity due to supply which arises when suppliers restrict the offer or availability of products to a certain period of time.	Controlled by the suppliers who limit the number of available units to customers.	Supply fails to meet the market demand.
Ku et al. (2012)		Results from a limitation on the available units caused by the vendor.	Results from consumer demand outstripping supply.
Gupta (2013)		Intentionally created by the retailer by inducing both limited time and limited quantity scarcity.	Arises when the retailer does not limit the supply of the product but the scarcity arises due to factors like high demand for the product thus leading to stock depletion.

2.3   Customer's motivation

Empirical studies show that there can be a combination of material, emotional and normative goals that play in compliance and noncompliance behaviors (e.g., Fisman and Miguel 2007; Parker 2006, 1999; Tyler 2006; May 2005; Wenzel 2005, 2004; Haines and Gurney 2003; Gezelius 2002; Simpson 2002; Hutter 2001; Alm, Sanchez and De Juan 1995).

The literature offers substantial evidence for the moderator effect of customer motivation in the relationship between scarcity and purchase intention. Higgins (2002) made the intuitively reasonable assertion that consumers make decisions consistent with their goals. Ku et al. (2012) used consumer motivation which focused on two goals that regulate the evaluation process; "promotion" and "prevention" in order to illustrate the effect of consumer motivation on the relationship between demand-based versus supply-based scarcity and purchase intention. They found that prevention focus increased the effectiveness of demand scarcity messages, while promotion focus increased the effectiveness of supply scarcity messages. However, customer's goal knowledge evolved with support from many recent empirical studies showing that there can be a combination of material, emotional and normative goals at play in compliance and noncompliance behaviors (Fisman and Miguel 2007; Parker 2006, 1999; Tyler 2006; May 2005; Wenzel 2005, 2004; Haines and Gurney 2003; Gezelius 2002; Simpson 2002; Hutter 2001). Thus, a proper understanding of the complex of customers' goals and its impact on the effectiveness of demand-based and supply-based scarcity remains nascent.

Siegwart Lindenberg and Linda Steg (2007) proposed new developments in goal-dependent framing and multiple goal frames. They focus on three main goals, including gain goal dealing with personal resources, hedonic goal dealing with current joy and normative goal dealing with social approval issues, which are consistent with the above mentioned empirical findings. To our knowledge, no research has investigated the moderating effect of customer goal frames between scarcity messages and purchase intention.

2.4   Perceived consumer competition

While competition among sellers has been studied for years, the phenomenon of consumer competition is relatively unexplored in the literature (Aggarwal et al. 2011). Consumer competition can be observed in many different contexts: auctions, in-store hoarding behavior, big sales events like Black Friday by Amazon.com and Singles' Day by Alibaba.com, and so forth. Consumer competition has been considered an important explaining factor for consumer purchase intention. When people have to invest their effort to win something, they earn significant psychological rewards (Aggarwal et al. 2011). Cialdini (2008) found that not only do people want an item more when it is scarce but they want it the most when they are competing for it. As a result, the more the customers perceive competition, the more they are likely to purchase the product and generate income for the manufacturers.

Gupta (2013) considered competitiveness a fixed internal factor and a personal trait and found that competitiveness moderates the relationship between scarcity messages and urgency to buy, in-store hoarding and in-store hiding. However, Aggarwal et al. (2011) considered competitiveness an external factor driven by environmental situations which is, for example, time scarcity message and supply scarcity message. Aggarwal et al. (2011) showed that consumer competition is a significant mediator in the relationship between scarcity messages and participants' purchase intentions. From these different findings, we found that the role of consumer competition in the link between scarcity appeals and consumer behaviors is uncovered fully. Furthermore, no research looked into the effect of consumer competition on supply-based and demand-based scarcity messages separately. Our paper aims to illustrate the mechanism between supply-based as well as demand-based scarcity appeals and purchase intention in the presence of consumer competition.

3. THEORETICAL FRAMEWORK

We propose the conceptual framework of scarcity effect on purchase intention in Figure 1 as follows.

Figure 1: Scarcity effect conceptual framework
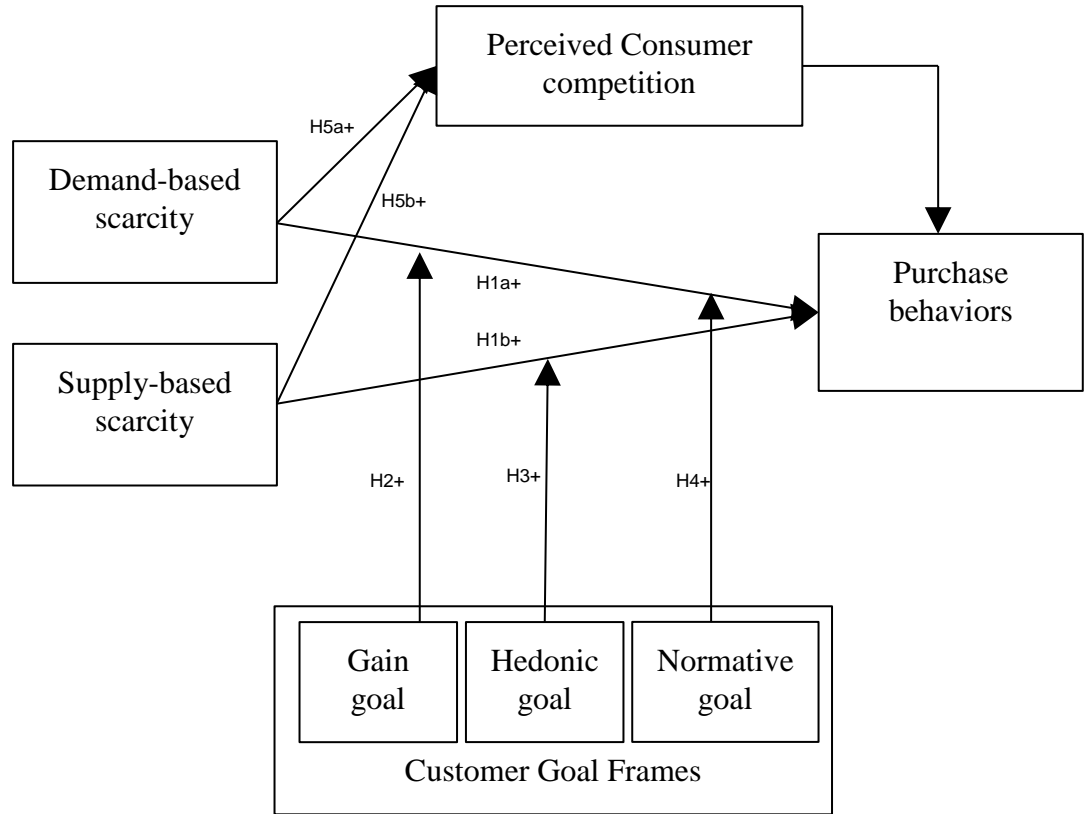
3.1 Direct effect of scarcity appeals on consumer purchase behaviors

Consumer purchase behavior, for example purchase intention, willingness-to-pay or loyalty is a well-known dependent variable in scarcity effect research. Purchase intention can be explained as the willingness of a customer to buy products or services. A positive effect of scarcity appeals on purchase intention has been found in many research and supported by both theory and empirical evidence (Ku et al. 2012, Eisend 2008, Jung and Kellaris 2004, Aggarwal et al. 2011).

Reactance theory is one of the most important and well-known theories to justify the scarcity effect. The theory asserted that when an individual perceived a loss of freedom, he/she experienced a psychological reaction that directs the person to safeguard his/her behavioral freedom (Brehm 1966; Clee and Wicklund 1980; Wicklund 1974). On the other hand, when an individual's freedom is threatened or eliminated, the individual will react by striving to gain their freedom back. In a scarcity condition, when a product is scarce, for example by limited supply,

people consider it as a signal of potential loss of freedom since this product is no longer fully accessible and they cannot get this product freely at any time they want in the future. As a result, people tend to acquire the product now to safeguard their freedom and have the opportunity to use it in the future.

Based on those arguments, we suggest that scarcity messages have positive effects on customer purchase intention. Additionally, providing reasons for scarcity may yield higher effects than just only a scarcity message, because customers receive more information when buying. First, demand-based scarcity provides customers with an evidence of high demand. Consumers interpret high demand as evidence of the product's quality (Worchel et al. 1975; Van Herpen et al. 2009). Furthermore, the "bandwagon effect" (Leibenstein 1950) also suggests that the demand for a commodity will increase when others are consuming or trying to get the same commodity. In other words, when a commodity is in high demand, consumers have higher intentions to buy it. Thus, we suggest the first hypothesis:

H1a: Demand-based scarcity has a positive effect on purchase behavior.

Second, supply-based scarcity refers to "uniqueness" (Snyder 1992) which strengthens the threat of freedom as mentioned in reactance theory. In addition, the "snob effect" (Leibenstein 1950) proposes that the demand for a commodity decreases due to the fact that others are acquiring the same commodity. It means that when a commodity is unique and limited to the market, consumers have higher intentions to buy it. Thus, we propose the following hypothesis:

H1b: Supply-based scarcity has positive effects on purchase behavior.

3.2 Moderating role of consumers' goals

The literature has shown that attitude towards a product is more favorable when the product's benefits match an individual goal (Aaker and Lee, 2001; Cesario, Grant and Higgins 2004; Chernev 2004). Higgins (2005) found that when there is a "fit", people engage more intensively in what they are doing and "feel right" about it. Furthermore, Higgins (2005) argued that people experience a regulatory fit when the manner of their engagement in an activity sustains their goal orientation or interests regarding that activity. Thus, we intend to explore the fit between consumer goal orientations and product scarcity appeals in this study.

Goal Frame Theory (Siegwart, Lindenberg and Steg 2007) suggests that goals govern or "frame" what people attend to, which knowledge and attitudes become

cognitively more accessible, how people evaluate various aspects of the situation, and what alternatives are being considered. This means that the goals frame will decide which cognitive information is accessible and how appeals from different types of scarcity messages are perceived. When the cognitive information and the appeals from scarcity messages match, the persuasion effect will be higher. We argue that when individual's goals "fits" with the scarcity messages they received, individuals will have a more favorable attitude towards the messages and higher purchase intention.

As mentioned above, different types of scarcity appeals convey with different persuasion messages to customers. However, each goal frame governs a particular goal to customers. Thus, we suggest that the level of "fit" between each type of scarcity appeals and each of the goal frames are significantly different, which leads to a possible moderating effect of the goal frame in the relationship between scarcity appeals and consumer purchase behaviors.

The gain goal is linked to thrift and safety sub-goals which relates to consumer economic motivations such as discounts, incentive and to safety or stability that leads customers to the least risky option (Barbopoulos and Johansson 2016). Thus, when the gain goal is triggered, cues regarding good deals and safe choices are the most accessible information. In addition, the message of demand-based scarcity is interpreted as evidence of the quality of the product in question (Worchel et al. 1975; Van Herpen et al. 2009). The consumers can assume that a product, which become scarce through a high demand, will be a good product, because the probability that such a huge number of buyers would buy a bad product should be rather small (Gierl et al. 2008). Hence, cognitive cues from gain goal and messages from demand-based scarcity seem to fit each other, which yields higher purchase intention potentially as the result.

Whereas, hedonic goal links to instant gratification sub-dimension (Barbopoulos and Johansson 2016) which relates to cues of "striving for satisfaction and comfort". It emphasizes on changes in pleasure, mood as well as energy levels and less on price consciousness and economic utility (Lindenberg and Steg 2007). Thus, the demand-based scarcity message which is interpreted as an evidence of great economical deal and good quality product do not fit the hedonic goal message. From these arguments, we propose the following hypothesis:

Hypothesis H2: Demand-based scarcity appeals will elicit higher purchase intentions when framed in support of a gain goal than when framed in support of a hedonic goal.

On the other hand, the message of supply-based scarcity implies exclusivity. Furthermore, consumers value the possession of exclusive products as a means to emphasize their own "uniqueness" (Snyder 1992) and attain social status (Lynn 1992) which associates with advancement and pleasures. The match between hedonic goal and supply-based scarcity messages can be explained by the snob effect which refers to the "extent to which the demand for a consumer`s good is decreased owning to the fact that others are also consuming the same commodity" (Leibenstein 1950). As people with hedonic goal are looking for something advanced in terms with pleasures and moods, they are not willing to buy something consumed by others; they need something more exclusive and unique. Supply-based scarcity messages then attract their attention. Whereas, exclusivity and uniqueness cues from supply-based scarcity do not show a good fit with economic motivations from gain goal or social norms from normative goal. Hence, we propose the third hypothesis:

Hypothesis H3: Supply-based scarcity appeals will elicit higher purchase intentions when framed in support of a hedonic goal than when framed in support of a gain goal or normative goal.

Normative goal explained by the moral and social norms (Barbopoulos and Johansson 2016) associates with a heightened sensitivity how one ought to act, according to personal norms, the opinions of others and the society as a whole (Lindenberg and Steg 2007). The cognitive cues regarding common opinions in the society fit the messages of high demand and demand outstripping supply derived from demand-based scarcity messages. In addition, bandwagon effect helps to explain this phenomenon. Bandwagon effect refers to "extent to which the demand for a commodity is increased due to the fact that others are also consuming the same commodity" (Leibenstein 1950). Thus, compared with poor fit between hedonic goal and demand-based scarcity, normative goal and demand-based scarcity show a good fit in cognitive cues which yield a higher purchase intention as the result.

Hypothesis H4: Demand-based scarcity appeals will elicit higher purchase intentions when framed in support of a normative goal than when framed in support of a hedonic goal.

3.3   Mediating role of consumer competition

Researchers agree that scarcity implies consumer competition, and successfully obtaining something scarce means that one has won the competition (Knowles and Linn 2004). Furthermore, Nichols (2012) proposes the term "consumer competitive arousal" as "Feelings and thoughts regarding the competitive nature of a purchase situation, and the belief that one would need to compete with other buyers to achieve a goal in a particular buying situation". In their research, scarcity is fundamental to the concept of competition, which plays a big role in measuring consumer competitive arousal.

Schindler (1998) illustrates that the joy-of-winning is the explanation for a noneconomic component of a transaction total value. Perceiving oneself as responsible for a gain of a promotion leads to the pride-like satisfaction of having won in an implied game against the seller and also against other consumers. Specifically, Schindler (1998) provides evidence for a noneconomic component to the effective consequences of a price promotion. He found that besides the economic component of money saving, noneconomic component is derived from consumer's perception of responsibility to gain the promotion, which leads to an increase in the likelihood of behavioral consequences such as repurchase and word-of-mouth communication. Overall, perceiving oneself as a winner in a consumer competition will lead to the pride-like satisfaction which then leads to noneconomic component of a promotion. We argue that perceived an implied competition among consumers will generate a noneconomic value to a promotional deal when an individual can gain the deal. In the other word, consumer competition will increase the attractiveness of the deal and then increase individual's purchase intention.

Thus, scarcity will signify consumer competition and then consumer competition increases customer purchase intention of a promotional offer by adding a noneconomic value to the offer.

Hypothesis H5a: Perceived consumer competition mediates the relationship between supply-based scarcity and purchase intention.

Hypothesis H5b: Perceived consumer competition mediates the relationship between demand-based scarcity and purchase intention.

We intend to explore the possible interaction effect of demand-based scarcity and supply-based scarcity on perceived consumer competition. We argue that perceived consumer competition arises from the relationship between both demand and supply side of one transaction. In addition, each type of scarcity appeals provides clues for only one out of demand and supply sides. If customers receive only one scarcity appeal, for example limited supply, they have only one evidence for the perception of competition among consumers. However, if two conditions are presented simultaneously, customers will have a sharp perception about the competition. We propose the last hypothesis:

H6: There is a positive interaction effect between demand-based scarcity and supply-based scarcity on perceived competition among buyers.

4. METHODOLOGY

In this section we will describe the methodology used in each of our experiments. This description will show an in-depth overview of the data collection process as well as the data analysis, which led us to our findings.

4.1 Research Design

For this project, we performed three independent experiments. In the first experiment, we conducted a field experiment to test how scarcity appeals influence consumer purchase behaviors in a real online promotional campaign in collaboration with the Norwayshop. The second and third experiments were survey-based experiments in which we tested the moderating effect of consumer motivation and the mediating effect of the perceived consumer competition respectively on the relationship between scarcity appeals and purchase intention.

Study 1

Our first study aims to test the effect of scarcity appeals (demand-based scarcity, supply-based scarcity) on the consumer's click-through rate in order to test our first hypothesis:

H1a: Demand-based scarcity has positive effect on purchase behavior.

H1b: Supply-based scarcity has positive effect on purchase behavior.

Using the database of the online retailer "Norwayshop.com" which is an e-commerce trader dedicated to selling Norwegian sweaters all over the world, we conducted an email campaign to their 13,870 subscribed users.

During the past four years, Norwayshop has invested heavily on e-commerce and online marketing campaigns, which makes it an attractive subject to collaborate to conduct our study. The Norwayshop subscribers receive constant promotions offered by the company during the year, on average, one promotion each month. Thus, our email campaign is conducted in the same manner and layout as previous emails in order to avoid any unnecessary suspicion from unfamiliarity with different designs or time frame.

For the purpose of this experiment, the subscribers were first randomly assigned into 4 different groups. Each group received one promotional email associated with 4 different scarcity conditions as followed:

Group 1 (3,467 subscribers): No scarcity message

Group 2 (3,468 subscribers): Demand-based scarcity message

Group 3 (3,467 subscribers): Supply-based scarcity message

Group 4 (3,468 subscribers): Demand-Supply-based scarcity

Campaign design

We launched a promotional email campaign, offering a 50% discount on one of the best-selling sweaters of the company. The e-mail was designed with the basic standards used by the company on their past mailing campaigns.

The email subject is the same for all 4 groups, namely "*Special promotion!*". We decided to use both female and male models in each email in order to reduce confound effects due to customers' gender. Product description are the same for all emails. Except for scarcity messages, all these elements remained constant in the four groups. The email format and design are shown in Figure 2.

Figure 2: Email design experiment 1
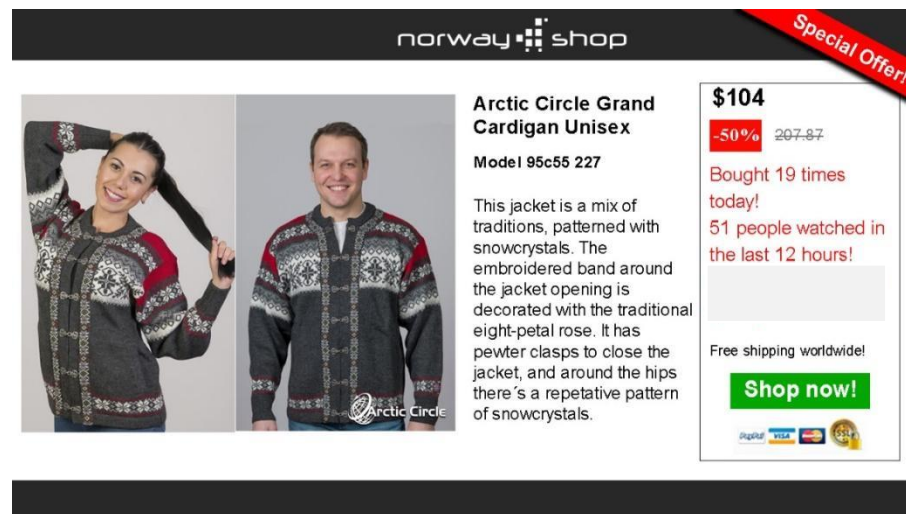
Group 1 is considered as control group which did not receive any scarcity message. Group 2 received demand-based scarcity messages: *"Bought 19 times today!- 51 people watched in the last 12 hours!"*. Group 3 received supply-based scarcity message *"Only 50 sweaters available at this price!"* while Group 4 received both demand-based and supply-based scarcity messages *"Only 50 sweaters available at this price! - Bought 19 times today! - 51 people watched in the last 12 hours! - Running out of stock quickly!"*. These scarcity messages have

been adjusted based on the advice of the Norwayshop experts who have experiences in the clothing retail industry.

All the emails were sent out at the same time and the results were collected within a period of 2 weeks by Mailchimp. Once the campaigns were finished, we measured the click-through rate of each group. The click-through rate is calculated by the number of recipients clicking the link inside the email divided by the number of recipients who opened the email.

Pretest for Study 2 and 3

Before starting the survey-based experiments, we performed a pretest in order to define the effectiveness of the scarcity appeals. The pretest questionnaire was sent out to 54 participants with only one question. The question was:

"*Imagine you go into the biggest store in town to look for a laptop. You see one laptop on display. You read a message next to the Laptop. The message is the following:*"

Participants were exposed to 3 scarcity messages, including the demand-based scarcity message, the supply-based scarcity message and the abundant-condition message in random order.

1. "Only 2 units available due to limited supply" which is the supply-based scarcity message.

2. "Only 2 units left due to high demand. 11 purchases made today" which is the demand-based scarcity message.

3. - "Plenty of this laptop in stock" which is the abundant-condition message.

After each message, the participants answered the question "*How available do you think this laptop is?*" on a seven point scale adapted from Eisend (2008) from 1=rather inadequate to 7=rather adequate.

The results showed that availability score of demand-based scarcity messages (M= 3.19) and supply-based scarcity message (M=2.75) are both smaller than the mean of the availability scale, which means that both demand-based scarcity message and supply-based scarcity message both signify scarcity condition.

Table 3: Compared means paired sample t-test

		Mean difference	**Sig. (2-tailed)**
Pair 1	Supply – Abundant	-3.58	0.00
Pair 2	Demand- Abundant	-3.14	0.00
Pair 3	Demand-Supply	0.44	0.094

As can be shown from Compare means paired-sample t-test in Table 3, we can see that supply-based and demand-based scarcity messages generate significantly lower availability scores compared to the abundant-condition messages while availability scores are insignificantly different between the supply-based and the demand-based scarcity messages.

From those results, we are confident to use these scarcity messages and abundant-condition messages in our survey, which ensure that scarcity level between supply-based and demand-based scarcity is the same and scarcity messages will signify scarcity condition.

Study 2

In order to test the Hypothesis H2, H3, H4 regarding the moderating effect of goal frame on the relationship between scarcity messages and purchase intention, we designed a 2x3 ANOVA (Scarcity appeals (*supply-based vs demand-based scarcity*) x Goal frames (*Gain vs Hedonic vs Normative*)) with 6 hypothetical stimuli. The scenario described a buying situation where the consumer was interested in buying a new laptop. The first message showed to the participants was:

"Imagine you go into the biggest store in town to look for a laptop. You see one laptop on display with a brief product information as shown in the below image. "

In the image, a laptop was exhibited next to a message that triggered one of the three the goals.

The messages used to trigger the consumer goal frames were as follows:

Gain goal _"This laptop with longer guarantee period and energy-saving mode will be an economical option. It ensures high performance and stability over a long time."_

Hedonic goal: _"This laptop is a special edition which focuses on enhancing entertaining experiences and visual effects. It gives you immediate comfort and pleasure anytime."_

Normative goal: _"All intellectual property rights reserved. This laptop provides a full pack of computer software's with copyright protection. Do not worry about the violation of the law."_

Right after the image, the scarcity appeals were displayed to the participant (demand-based and supply-based scarcity). These were taken from the pretest as mentioned above. The experimental subjects were randomly exposed to only one of these scenarios. Two of the stimuli used in the survey are shown in Figure 3. After exposing to one of these scenarios, subjects indicate their own purchase intention for the laptop in the assigned scenario.

Figure 3: Stimuli experiment 2
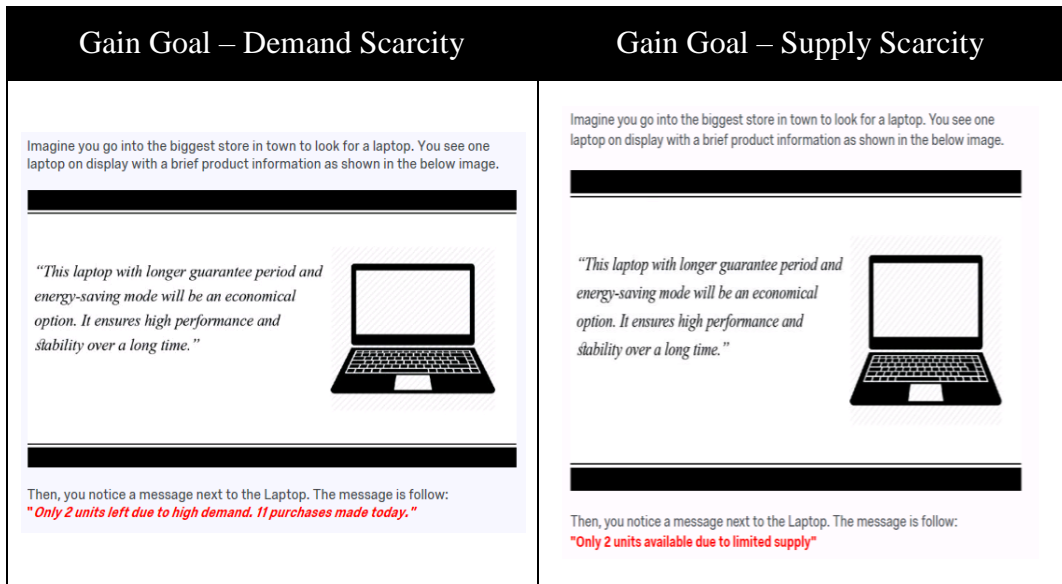
Manipulation check of goals in Study 2

To validate that the goal messages were understood by participants and most importantly, that these messages generate a right attitude for experimental subjects that corresponded to the dimension frame that each motivational goal cover.

Each participant received a question about the goal message. This question was based on a 7-point scale from disagrees to agree, to indicate what the message was about. The possible answers were "About economic motivation, safety and security" which corresponded to the gain goal frame, "About satisfaction and comfort" corresponded to the hedonic goal frame and "About social norms and laws" that corresponded to the normative goal frame. These answers are adapted from the study done by Siegwart Lindenberg and Linda Steg (2007).

Study 3

The objective of this study was to test how the perceived consumer competition mediates the relationship between scarcity appeals and purchase intention, which leads us to verify our last two hypotheses H5 and H6.

Hypothesis H5a: Perceived competition mediates the relationship between supply-based scarcity and purchase intention.

Hypothesis H5b: Perceived competition mediates the relationship between demand-based scarcity and purchase intention.

H6: There is an interaction effect between demand-based scarcity and supply-based scarcity on perceived competition among buyers.

We designed a 2x2 ANOVA (Demand-based scarcity (*abundant-condition vs demand-based scarcity*) x supply-based scarcity (*abundant-condition vs supply-based scarcity*)) with 4 stimuli as described below.

First, the participant was introduced to the following situation:

"Now, imagine you enter a computer shop to buy a laptop. The Sales representative introduces you a laptop and gives you information about its current availability. The information is shown in the image below."

Then, each participant was randomly exposed to only one of the following stimuli which were taken from the pretest.

1. – Abundant-condition: *"Plenty units in stock!"*

2. - Demand-Supply-based Scarcity: *"Only 2 units left due to limited supply and high demand."*

3. - Demand scarcity: *"Only 2 units left due to high demand. 11 purchases made today."*

4. - Supply scarcity: *"Only 2 units available due to limited supply".*

The design of the image exposed to one participant in study 3 was shown in Figure 4. After being exposed to the assigned scenario, participants indicated their purchase intention and their perceived consumer competition.

Figure 4: Stimuli experiment 3

Measurement

The dependent variable, purchase intention, was measured using an average of two, seven-point scales questions. The first question was: "If this offer is presented to you in real life, how LIKELY will you be to BUY this laptop?" and the second question was: "If this offer is presented to you in real life, would you CONSIDER TO BUY this laptop?".

For the perceived consumer competition, we adopted the scale and items from Nichols (2011) study. The items were modified to be suitable with the product category and purchase situation as recommended by the author. We asked participants that based on their honest judgment, in the hypothetical case if they

would have bought the laptop and in a 7 point scale, how much they would disagree or agree with seven statements.

The statements were:

1. - I felt like I was competing with others.

2. - I was trying to buy something that others were also trying to buy.

3. - After shopping for this item, I felt like I had "won"

4.- Other people who were shopping for this item felt like they "lost" if they were not able to buy it.

5. - Trying to buy this item was a competition

6. - I felt successful after shopping for this item

7. - I felt anxiety about being able to buy this item

Questionnaire design

We developed an online questionnaire powered by Qualtrics software which combines Study 2 and Study 3 into one survey.

Due to a lack of financial support and time, we cannot use more advanced sampling technique such as judgement sampling or quota sampling in order to identify and take only "targeted" participants or experts. We decided to use convenience and snowball (Emerson 2015) as sample techniques to deliver and spread out the questionnaire. Because the product used in our studies is laptop which is consumed by most of internet users, it makes convenience and snowball sampling via the Internet more representative. The survey was delivered first through our own network and then to recipients' network. Additionally, the survey was designed in three languages, English, Spanish and Vietnamese which has been double checked with other international students in order to give validity to the study.

The survey consisted of 3 independent sections, including demographic part, experiment 2 and experiment 3 sections. The questionnaire design is shown in Figure 5.

In experiment 3, we measured perceived consumer competition after measuring purchase intention in order to avoid the response substitution bias (Gal and Rucker 2011) that may cause. If the participant answered the question regarding consumer competition first, they will put more weight on consumer competition while answering the purchase intention question. For this reason, in order to measure the level of actual purchase intention and consumer competition, we decided to measure the purchase intention before the perceived consumer competition.

Figure 5: Questionnaire
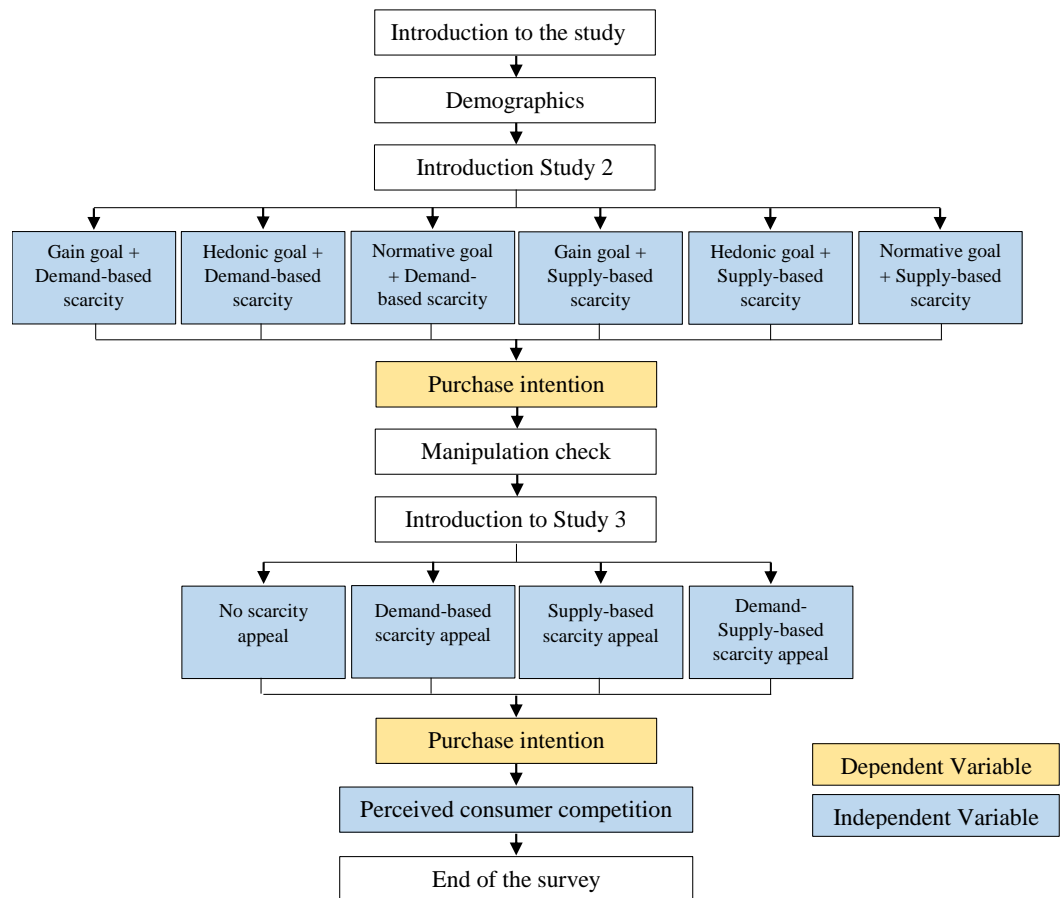
5. DATA ANALYSIS

In this section we will present our procedure of the data analysis step by step. First, data screening and cleaning were performed. Second, the manipulation check for 3 goal messages would be conducted with the pair-sample t test. Third, the direct effect of demand-based scarcity and supply-based scarcity on purchase behavior which is in form of click-rate in our email campaign would be presented with the independent sample t-test. Fourth, we would check whether goal frames moderate the relationship between scarcity and purchase intention. Fifth, the mediating effect of consumer competition on the relationship between scarcity appeals and purchase intention would be checked with Hayes PROCESS model 4. Lastly, the interaction effect between supply-based scarcity and demand-based scarcity on consumer competition would be tested with 2-way, between-subjects ANOVA.

5.1 Sample characteristics

Email campaign

The database with 13,870 subscribers was collected over the last 5 years through direct invitation at three Norwayshop stores located in the center of Oslo, Norway, along with online invitation efforts. Their customers are from all over the world with diversity in nationalities, ages, socioeconomic level, etc. so this sample is considered representative of the entire population.

Questionnaire

In our questionnaire, 220 respondents completed the survey. As our survey randomly and evenly allocated participants into different groups, it ensured that each of six groups in our experiment 2 got at least 30 observations and each of four groups in our experiment 3 got at least 45 observations.

Overall, the age range is dominated by 25-35 (50%), followed by 17-24 (29%) and 35-44 (19%). In the total sample, there was a distribution of 43% males and 57% females.

5.2 Data cleaning

The data screening showed that the manipulation check questions for goals frame and consumer competition questions had some faking answers in form of

repetition in scores or extreme scores. We considered it highly likely that some participants did not answer based on their honest judgement. We found 21 respondents who had the same scores for all goal frame questions in experiment 2, and 22 respondents who had the same scores for all 7 consumer competition questions. Thus, we got 199 observations for experiment 2, and 198 observations for experiment 3.

Table 4: Manipulation check results

	Pair	Mean difference	Significant (2. tailed)
Gain goal frame *"Economic motivation, safety and security"*	Gain-Hedonic	0.581	0.002
	Gain-Normative	1.452	0.000
Hedonic goal frame *"satisfaction and comfort"*	Gain-Hedonic	-2.343	0.000
	Normative-Hedonic	-2.257	0.000
Normative goal frame *"social norms and laws"*	Normative-Gain	0.924	0.000
	Normative-Hedonic	1.697	0.000

By doing compare means test, paired sample T test, we confirm that our goal messages work well in priming readers. Gain goal message generated a higher score for goal about economic motivation, safety and security while hedonic goal message yielded higher score for goal about satisfaction and comfort, normative goal message accompanied with higher score for goal about social norms and laws. The results are summarized in Table 4.

6. RESULTS

6.1 Experiment 1

The results from the email campaign found that demand-based scarcity email yields 15% click-through rate, compared with only 10% click-through rate in no scarcity email. In addition, supply-based scarcity messages yields 13% click-through rate. Descriptive statistics for study 1 are shown in Table 5.

Table 5: Click-through rate.

Group	Click-through rate
No-scarcity message	10%
Supply-based Scarcity	13%
Demand-based Scarcity	15%
Demand-Supply-based Scarcity	14%

The results show that demand-supply-based scarcity group is not significantly more effective than demand-based scarcity or supply-based scarcity message regarding the click-through rate ($p=0.6 \gg 5\%$). Thus, no interaction effect between supply-based and demand-based scarcity on click-through rate is found.

Furthermore, we conducted an independent samples t-test to confirm the effect of demand-based scarcity and supply-based scarcity on click-through rates in comparison with no scarcity condition.

Table 6: Scarcity appeals' direct effect

	Mean difference	Sig. (2-tailed)
Demand-based scarcity vs No scarcity	0.052	0.022
Supply-based scarcity vs No scarcity	0.026	0.223

The results confirm that demand-based scarcity messages yield a significantly higher click rate in an email campaign than no scarcity message does, which supports the hypothesis H1a. The positive effect of supply-based scarcity message

on click-through rate is in the anticipated direction but not statistically significant compared with the control group, which partially supports the hypothesis H1b.

6.2 Experiment 2

Hypothesis 2 and 4 propose that demand-based scarcity appeals will elicit higher purchase intentions when framed in support of a gain goal message and normative goal message than when framed in support of a hedonic goal message. Hypothesis 3 suggests that supply-based scarcity appeals will elicit higher purchase intentions when framed in support of a hedonic goal message than when framed in support of a gain goal and normative goal message.

Regarding the goal frame, we have two different coding methods to transform the qualitative data from the questionnaire results to quantitative data. First, based on the goal messages exposed to participants, we transformed normative goal message to 1, hedonic goal message to 2 and gain goal message to 3. Second, instead of using pre-assigned goal messages, we used the actual scores for each goal frame in manipulation test question. The highest score among scores for gain goal, normative goal and hedonic goal reflects participants' actual current goal in that scenario. The coding scheme is as follow: normative goal to 1, hedonic goal to 2 and gain goal to 3. Specifically, we found 21 participants who have different goal frame from the goal message they received.

With the first coding method based on the pre-assigned goal message, we ran a 2-way ANOVA with purchase intention as the dependent variable.

Table 7: ANOVA: The moderating effect of goal frame

	df	F	p
DV: purchase intention			
Scarcity appeals	1	12.674	0.00
Goal frame	2	1.610	0.203
Scarcity*Goal frame	2	0.891	0.412

*R-square = 0.081
*Scarcity appeals: Demand-based scarcity =1, Supply-based scarcity =0
*Goal frame (based on pre-assigned goal messages): Gain goal =3, Hedonic goal =2, Normative goal =1

As shown in the Table 7, the interaction effect between scarcity appeals and goal frame is not significant (p=41.2% >10%).

The graph in Figure 6 shows that demand-based scarcity elicits higher purchase intention in support of both normative and gain goal frame than in support of hedonic goal. However, supply-based scarcity message yields higher purchase intention when frames with gain goal, than hedonic goal and normative goal.

Figure 6: Goal frame and scarcity appeals on purchase intention.

With the second coding method based on the participants' own perception about goal frame, we ran 2-way, between subjects ANOVA. The new results are shown in Table 8.

Table 8: ANOVA: The moderating effect of goal frame (second coding)

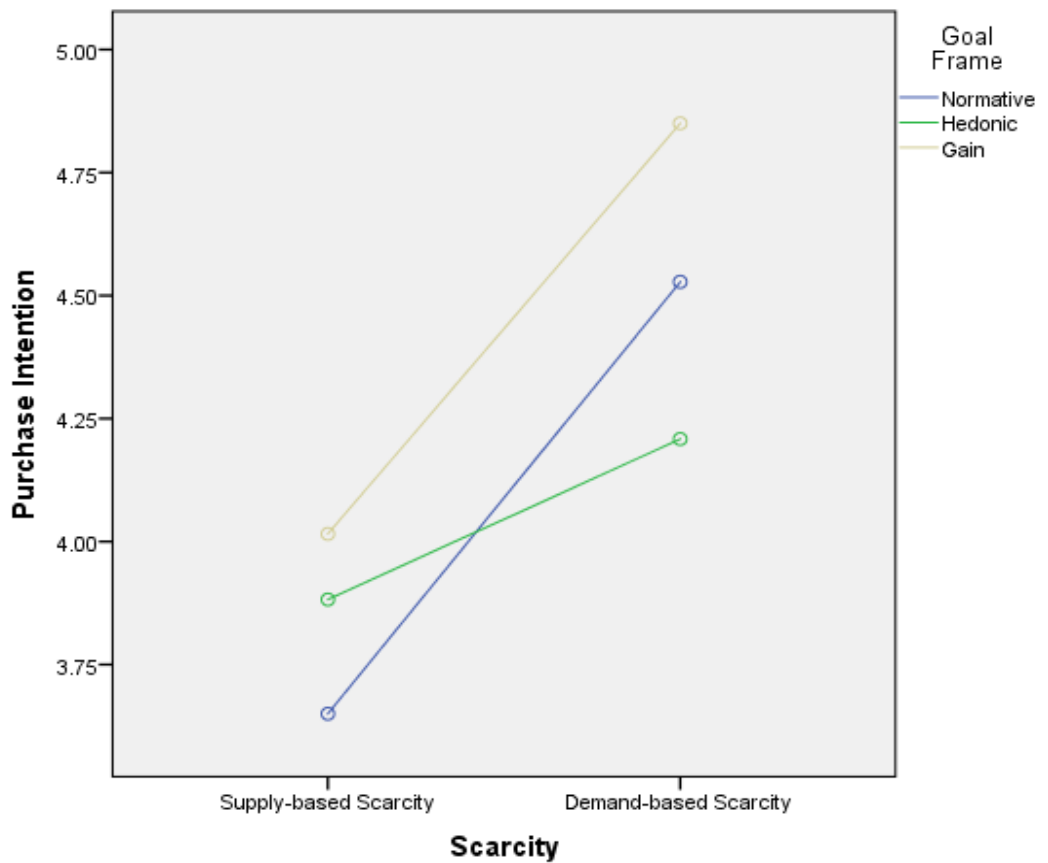|	df	F	p
DV*: purchase intention*			
Scarcity appeals	1	13.819	0.000
Goal frame 2	2	2.759	0.066
Scarcity*Goal frame 2	2	6.822	0.001

*R-square = 0.142
*Scarcity appeals: Demand-based scarcity =1, Supply-based scarcity =0
*Goal frame 2 (based on perceived goal frames): Gain goal =3, Hedonic goal =2, Normative goal =1

Based on the results, we found that there is a significant interaction effect between goal messages and scarcity messages (F=6.822 and p=0.001<5%).

Then, we visualized the relationship between purchase intention and scarcity appeals separated by the goal frames. We confirm the interaction effect between scarcity and goal messages as shown in Figure 3.2, in which hedonic line cut the gain and normative line.

Figure 7: Interaction effect between scarcity and goal messages.
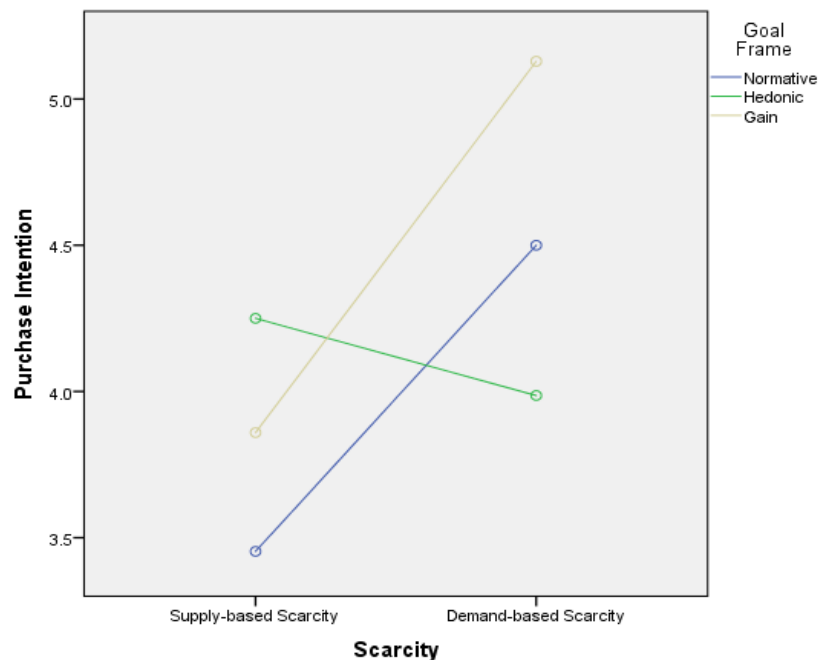
Further analysis to compare the effect of each goal frame on the relationship between scarcity appeals and purchase intention confirms the interaction effect. We found that demand-based scarcity yields significantly higher purchase intention than supply-based scarcity when they are coupled with gain goal (Mean

difference = 1.27, p=0.00). The same effect was found with normative goal (Mean difference =1.05, p=0.003). On the other hand, supply-based scarcity yields higher purchase intention than demand-based scarcity when they are coupled with hedonic goal. The effect is directionally significant (Mean difference =0.26) but not statistically significant (p=0.39>>0.05).

The descriptive statistics which show the purchase intention scores for each goal frame in each scarcity appeal are summarized in Table 9. An independent samples t-test was conducted to confirm the mean difference among these purchase intention levels.

Table 9: Descriptive statistics and independent samples T-test

Scarcity	Goal	Mean	Mean difference	Sig. (2-tailed)	Note
Demand-based scarcity	Gain goal	5.13		0.00	*Significant*
	Hedonic goal	3.99	1.14		
	Normative goal	4.5		0.083	*Marginally significant*
	Hedonic goal	3.99	0.51		
Supply-based scarcity	Hedonic goal	4.25		0.221	*Directionally significant*
	Gain goal	3.86	0.39		
	Hedonic goal	4.25		0.03	*Significant*
	Normative goal	3.45	0.80		

From these results, we found that demand-based scarcity yields significant higher purchase intention in support of gain goal and normative goals than hedonic goal. On the other hand, supply-based scarcity yields significant higher purchase intention in support of hedonic goal than normative goal. Although supply-based

scarcity does not yield statistically significant higher purchase intention in support of hedonic goal than gain goal, it shows a directionally significant effect.

6.3 Experiment 3

Before running the linear regression to test the mediating effect of perceived consumer competition, we first checked the linear regression assumptions. First, we checked the assumption that the errors are homoscedastic.

Table 10: ANOVA: results

	Sum of Squares	**df**	**F**	**Sig.**
Regression	3.031	2	0.918	0.403
Residual	151.884	92		
Total	154.915	94		

Dependent Variable: unstandardized residual-squared

Predictors: (Constant), Demand-based scarcity, Perceived consumer competition

The ANOVA results show that we cannot reject the null hypothesis of homoscedasticity. In other words, the assumption of constant variance in the errors is satisfied.

Second, we checked the assumption if the errors are normally distributed.

Figure 8: Histogram of the unstandardized residual
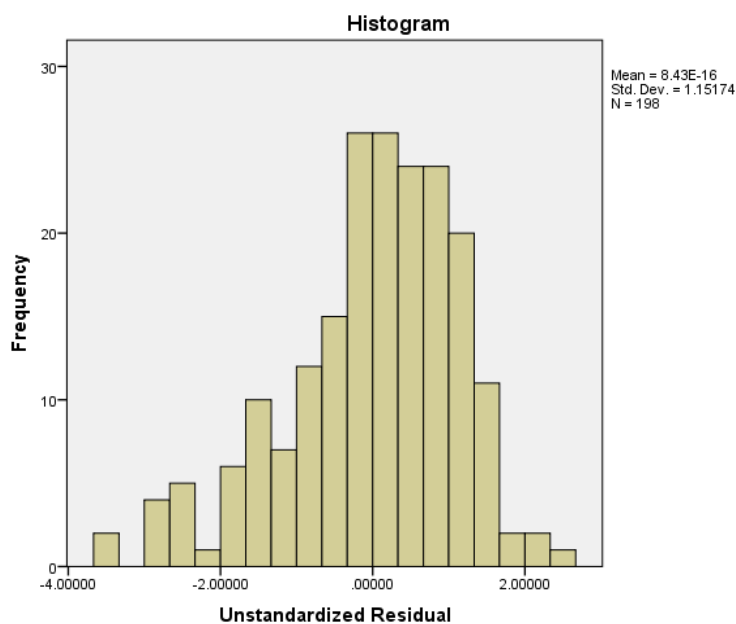
By plotting the histogram for the unstandardized error of the model as shown in Figure 8, we found that the errors were not perfectly normally distributed. However, when the number of observations in the data is large (200 observations with about 50 observations per group), the detrimental effect of non-normality may be negligible (Hair et al. 2010).

The hypothesis H5a (b) proposed that Perceived consumer competition mediates the relationship between demand (supply)-based scarcity and purchase intention. Hayes' PROCESS model 4 was explored to test for mediation, which advanced with Sobel test. Hayes' PROCESS model 4 started with testing the relationship between perceived consumer competition and demand-based scarcity or supply-based scarcity. Then, it tested the relationship between purchase intention as dependent variable and perceived consumer competition and demand (supply)-based scarcity as independent variables.

The results are shown in Table 11 and Table 12.

Table 11: The mediation effect of perceived consumer competition on demand-based scarcity and purchase intention

	β	t	p
DV: Consumer Competition			
Constant	3.6860	31.3013	0.00
Demand-based scarcity	0.5717	3.4845	0.00
	β	t	p
DV: Purchase intention			
Constant	2.7115	9.370	0.00
Consumer competition	0.3580	4.9960	0.00
Demand-based scarcity	0.3572	2.1057	0.0365

R-square= 0.158

The Sobel test provided significant evidences that perceived consumer competition partially mediates the relationship between demand-based scarcity and purchase intention. Specifically, we found that demand-based scarcity has a direct effect on purchase intention (β=0.3572, p=0.0365 <5%) and an indirect

effect on purchase intention through perceived consumer competition (β=0.2047, p=0.0048< 5%).

Table 12: The mediation effect of perceived consumer competition on supply-based scarcity and purchase intention

	β	t	p
DV: Consumer Competition			
Constant	3.6909	32.7618	0.00
Supply-based scarcity	0.6100	3.7306	0.0003
	β	t	p
DV: Purchase intention			
Constant	2.7614	9.5082	0.00
Consumer competition	0.4228	5.8440	0.00
Supply-based scarcity	-0.261	-1.5220	0.1296

R-square = 0.149

Consumer competition has been found to fully mediate the relationship between supply-based scarcity and purchase intention. Specifically, supply-based scarcity did not have a significant direct effect on purchase intention (β=-0.261, p= 0.1296>10%) but it had significant indirect effect on purchase intention through consumer competition (β=0.2579, p=0.0019< 5%).

From the Hayes' PROCESS model 4 analysis with Sobel test for mediation effect of perceived consumer competition, we found that the total effect of supply-based scarcity on purchase intention is 0.258 which was much smaller than the total effect of demand-based scarcity (β= 0.562).

From the descriptive statistics analysis, we found that mean of consumer competition in group with both demand-based and supply-based scarcity was the highest among 4 groups (mean= 4.46). The descriptive statistics analysis results are shown in Table 13.

Table 13: Perceived consumer competition

		Supply-based scarcity	
		0	1
Demand-based scarcity	0	**3.25**	4.13
	1	4.08	**4.46**

0: No scarcity appeal   1: Scarcity appeal

Based on the finding, we continue to test the interaction effect between supply-based and demand-based scarcity on consumer competition with 2-way ANOVA test with consumer competition as a dependent variable, and demand-based and supply-based scarcity as independent categorical variables. The results are shown in Table 14.

Table 14: The interaction effect between supply-based scarcity and demand-based scarcity on Consumer Competition

	df	F	Sig.
DV*: Consumer competition*			
Demand-based scarcity	1	13.373	0.000
Supply-based scarcity	1	16.129	0.000
Demand*Supply based scarcity	1	2.611	0.108

R-squared = 0.14

The results from the test show that demand-based scarcity and supply-based scarcity are not significantly interacted (p=10.8%).

Furthermore, we conducted the linear regression with consumer competition as a dependent variable and independent variables, including demand-based scarcity, supply-based scarcity and interaction variable. The results are shown in Table 15.

Table 15: Linear regression DV: Consumer competition

	β	t	p
DV: *Consumer Competition*			
Constant	3.251	20.530	0.00
Demand-based scarcity	0.832	3.823	0.00
Supply-based scarcity	0.889	3.929	0.00
Supply*Demand	-0.510	-1.616	0.108

Interaction has negative coefficients ($β$= -0.510), which means that when demand-based scarcity and supply-based scarcity are used simultaneously, the purchase intention is less than the sum of purchase intentions when they are used separately. However, we can see that in case of demand-based scarcity and supply-based scarcity, that the total effect is still higher than demand-based scarcity or supply-based scarcity separately (0.832 + 0.889 + (-0.510) = 1.211 > 0.889). From this finding, demand-based scarcity and supply-based scarcity together still generate higher consumer competition than when it is used separately.

6.4 Summary of the results

Results from Study 1 and Study 3 confirm that demand-based scarcity has a significant effect on purchase intention, which supports Hypothesis H1a. However, supply-based scarcity shows an insignificant effect on purchase intention, which rejects the Hypothesis H1b.

The significant interaction effects between goal frames and scarcity appeals give strong support for hypothesis H2, H3 and H4. Furthermore, the results show convincing evidence of the mediating role of perceived consumer competition on the link between scarcity appeals and purchase intention, which supports hypothesis H5a and H5b.

Lastly, hypothesis H6 is rejected because of the insignificant effect of interaction term between demand-based scarcity and supply-based scarcity.

The table below shows an overview of which hypotheses were supported.

Table 16: Hypothesis testing results.

Hypotheses	Variables	Results
H1a	Demand-based scarcity has positive effect on purchase behavior.	SUPPORTED
H1b	Supply-based scarcity has positive effect on purchase behavior.	NOT SUPPORTED
H2	Demand-based scarcity appeals will elicit higher purchase intention when framed in support of a gain goal than when framed in support of a hedonic goal.	SUPPORTED
H3	Supply-based scarcity appeals will elicit higher purchase intention when framed in support of a hedonic goal than when framed in support of a gain goal or normative goal.	SUPPORTED
H4	Demand-based scarcity appeals will elicit higher purchase intention when framed in support of a normative goal than when framed in support of a hedonic goal.	SUPPORTED
H5a	Perceived consumer competition mediates the relationship between supply-based scarcity and purchase intention.	SUPPORTED *Full mediation*
H5b	Perceived consumer competition mediates the relationship between demand-based scarcity and purchase intention.	SUPPORTED *Partial mediation*
H6	There is a positive interaction effect between demand-based scarcity and supply-based scarcity on perceived consumer competition.	NOT SUPPORTED

7. GENERAL DISCUSSION

The primary purpose of this master thesis is to uncover the effect of scarcity messages on customers' purchase behaviors. While previous research mainly focused on the effect of different type of scarcity appeal on customer behaviors, this study examines the interaction of different types of scarcity messages. Moreover, the study examines the roles of customer motivation and consumer competition in the relationship between scarcity appeals and customer purchase behaviors.

The results show that there is a significant main effect of demand-based scarcity on consumer purchase behaviors. This finding is confirmed in both Study 1 and Study 3, in which demand-based scarcity has a direct effect on click-through rate and purchase intention respectively. Supply-based scarcity shows an insignificant positive effect on click-through rate in Study 1 and only indirect effect through perceived consumer competition on purchase intention in Study 3. The findings show that supply-based scarcity is not effective in the two product categories used in our studies, including sweaters and laptops. One explanation for this is that consumers become more aware of the sellers' tactics such as supply-based scarcity. As supply-based scarcity has been used widely by the seller, consumers first gain awareness of this tactic, and then wrestle with interpreting why marketers use it. Gradually, consumers develop persuasion knowledge to cope with this tactic (Friestad and Wright 1994), which leads to an increase in perceived deceptiveness and decrease in credibility. In contrast, due to the rise of real-time technology and eWOM (electronic word of mouth), demand-based scarcity provides consumers with more credibility. Regarding the interaction effect between demand-based scarcity and supply-based scarcity, the results do not indicate a significant effect. Thus, those two types of scarcity messages do not interact with each other when being included simultaneously in a product offer.

The results provide strong evidences to confirm that goal frames moderate the relationship between scarcity appeals and purchase intention. The findings suggest that demand-based scarcity should be combined with gain goal or normative goal to improve purchase intention. Whereas, supply-based scarcity should be combined with hedonic goal.

Perceived consumer competition is found to mediate the relationship between scarcity appeals and purchase intention. The results show that both demand-based

scarcity and supply-based scarcity have significant positive effect on perceived consumer competition. When perceived consumer competition is accounted for, it fully mediate the relationship between supply-based scarcity and purchase intention, but only partially mediate the relationship between demand-based scarcity and purchase intention.

7.1 Theoretical contributions

This master thesis contributes theoretically to the field of scarcity in several ways. First, although the study found no significant interaction effect between demand-based scarcity and supply-based scarcity on perceived consumer competition and purchase intention, our study is the first research in the field to examine the joint effect of two scarcity appeals.

Second, this research uncovers that goal frames moderate the effect of scarcity appeals on purchase intention. This finding is strongly supported by regulatory fit theory and highly relevant for marketers. The combination of scarcity appeals, including demand-based scarcity and supply-based scarcity with each goal frame, namely gain goal, hedonic goal and normative goal can lead to different consumer evaluation.

Last but not least, this research strives to resolve the controversial findings regarding the role of consumer competition in the relationship between scarcity appeals and purchase intention. We find that scarcity appeals are significant predictors of consumer competition. Furthermore, perceived consumer competition mediates the relationship between different types of scarcity appeals and purchase intention differently. While perceived consumer competition fully mediates the link between supply-based scarcity and purchase intention, it only partially mediates the relationship between demand-based scarcity and purchase intention. This finding is crucial to understand the mindset of consumers in order to influence them. Through perceived consumer competition, we understand how supply-based scarcity can affect purchase intention.

7.2 Managerial implications

The findings from the study are particularly important to marketers as they give insights and guidelines for strategically applying scarcity appeals in their messages to customers in order to maximize the influence and effectiveness.

If marketers want to achieve higher purchase intention from consumers, they should consider using scarcity appeals. The findings provide substantial evidences that demand-based scarcity positively influences click-through rate and purchase intention. On the other hand, supply-based scarcity shows indirect effect on purchase intention through perceived consumer competition. Thus, it is clear that scarcity is an effective marketing instrument to generate more favorable consumer purchase behaviors.

The findings are empirically relevant to marketers since the effect of demand-based scarcity and supply-based scarcity is examined with a real email campaign in collaboration with a clothing company, Norwayshop. Due to the fact that their customers are from all over the world, the results are not limited within Norwegian market.

If the goal is to achieve the best possible purchase intention, marketers should be aware of the combination of scarcity appeals and goal frames. The study found that demand-based scarcity should be matched with gain goal or normative goal while supply-based scarcity fits well with hedonic goal. Regulatory fit theory can explain these findings. If messages used by marketers match in content with each other, they will generate higher consumer evaluation and persuasion power.

Marketers should understand the mindset of consumer when they encounter scarcity appeals in order to better manage their purchase behaviors. The study provides marketers with an insight to how perceived consumer competition mediates the relationship between scarcity appeals and purchase intention. This finding is relevant because it gives marketers one more option in order to achieve higher purchase intention by strengthening the perceived consumer competition. Besides applying scarcity appeals, marketers should put more effort to raise the consumers' awareness of perceived consumer competition.

Last but not least, the joint effect between supply-based scarcity and demand-based scarcity is not significant. However, the results show that using both demand-based scarcity and supply-based scarcity simultaneously generates higher purchase intention than using it separately. If possible, it is advisable for marketers to use both demand-based and supply-based scarcity simultaneously in order to generate the highest purchase intention.

8. LIMITATIONS AND FURTHER RESEARCH

Like all others, our study has certain limitations that can be used as a foundation for future research. The first limitation we can denote is that due to the nature of the products used in the experiments, the results may not be generalized to all product categories. The reason for this is that the products used in this research are mass production products such as clothes and laptops. These products are by far different from luxurious products in the nature of supply-based scarcity. Luxurious products are always perceived as limited products due to limited raw materials such as diamonds or due to limited craftsmen such as Swiss watches. On the other hand, supply-based scarcity on mass-production product mostly come from temporarily limited supply due to price promotion or supply chain issues. Thus, limited supply in luxurious products shows more uniqueness and advancement about the owner than that in mass-production products. For that reason, using only mass-production product in our study may underestimate the effect of supply-based scarcity, which also suggests including a product category characteristic in scarcity effect model in future research.

The second limitation came to light when we were analyzing the data regarding goal frame messages. We found that some of the respondents perceived the goal messages different from what the goal messages intended to convey. For further research, we suggest to use stronger goal messages in furtherance of being able to frame the customers correctly. Furthermore, the findings suggest that the difference may come from difference in personality or context. From this suggestion, future research may continue to investigate how to frame the correct goal to each receiver by considering more factors such as personality and reading context.

Furthermore, it will be interesting to find out if scarcity appeals have different effects across countries or cultures. While Westerners are more independent and separate from other people, Easterners are more connected to and interdependent on others. Easterners will adjust to the group or community they are in (Lim 2016). Scarcity appeals are strongly related to how people perceived other's behaviors, which is explained in bandwagon and snob effects as discussed above.

Finally, we believe that for further studies, researchers may focus on generating new metrics to measure consumer purchase behaviors. They should take advantage of new technologies in order to track the real consumer purchase

behaviors such as purchase rate. Moreover, new technologies enable researchers to measure new indicators, for example, purchase probability and repurchase probability while using scarcity messages.

REFERENCES

Aaker, J. L., & Lee, A. Y. (2001). "I" seek pleasures and "we" avoid pains: The role of self-regulatory goals in information processing and persuasion. Journal of Consumer Research, 28(1), 33-49.

Aggarwal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity messages. Journal of Advertising, 40(3), 19-30.

Alm, J., Sanchez, I., & De Juan, A. (1995). Economic and noneconomic factors in tax compliance. Kyklos, 48(1), 1-18.

Barbopoulos, I., & Johansson, L. O. (2016). A multi-dimensional approach to consumer motivation: exploring economic, hedonic, and normative consumption goals. Journal of Consumer Marketing, 33(1), 75-84.

Brehm, J. W. (1972). Responses to the loss of freedom: A theory of psychological reactance. General Learning Press.

Cesario, J., Grant, H., & Higgins, E. T. (2004). Regulatory fit and persuasion: Transfer from" feeling right.". Journal of personality and social psychology, 86(3), 388.

Chernev, A. (2004). Goal–attribute compatibility in consumer choice. Journal of Consumer Psychology, 14(1-2), 141-150.

Cialdini, Robert B. (2008), Influence: Science and Practice, 5th ed., Boston: Pearson Education.

Clee, M. A., & Wicklund, R. A. (1980). Consumer behavior and psychological reactance. Journal of Consumer Research, 6(4), 389-405.

David Gal, Derek D. Rucker (2011) Answering the Unasked Question: Response Substitution in Consumer Surveys. Journal of Marketing Research: February 2011, Vol. 48, No. 1, pp. 185-195.

Eisend, M. (2008). Explaining the impact of scarcity appeals in advertising: The mediating role of perceptions of susceptibility. Journal of Advertising, 37(3), 33-40.

Emerson, R. W. (2015). Convenience sampling, random sampling, and snowball sampling: How does sampling affect the validity of research?. Journal of Visual Impairment & Blindness (Online), 109(2), 164.

Fisman, R., & Miguel, E. (2007). Corruption, norms, and legal enforcement: Evidence from diplomatic parking tickets. Journal of Political economy, 115(6), 1020-1048.

Förster, J., Liberman, N., & Higgins, E. T. (2005). Accessibility from active and fulfilled goals. Journal of Experimental Social Psychology, 41(3), 220-239.

Gezelius, S. S. (2002). Do norms count? State regulation and compliance in a Norwegian fishing community. Acta Sociologica, 45(4), 305-314.

Gierl, H., & Huettl, V. (2010). Are scarce products always more attractive? The interaction of different types of scarcity signals with products' suitability for conspicuous consumption. International Journal of Research in Marketing, 27(3), 225-235.

Gierl, H., Plantsch, M., & Schweidler, J. (2008). Scarcity effects on sales volume in retail. The International Review of Retail, Distribution and Consumer Research, 18(1), 45-61.

Griskevicius, V., Goldstein, N. J., Mortensen, C. R., Sundie, J. M., Cialdini, R. B., & Kenrick, D. T. (2009). Fear and loving in Las Vegas: Evolution, emotion, and persuasion. Journal of Marketing Research, 46(3), 384-395.

Gal, D., & Rucker, D. D. (2011). Answering the unasked question: Response substitution in consumer surveys. Journal of Marketing Research, 48(1), 185-195.

Gupta, S. (2013). The psychological effects of perceived scarcity on consumers' buying behavior.

Haines, F., & Gurney, D. (2003). The shadows of the law: Contemporary approaches to regulation and the problem of regulatory conflict. Law & Policy, 25(4), 353-380.

Herpen, E. V., Pieters, R., & Zeelenberg, M. (2005). How product scarcity impacts on choice: Snob and bandwagon effects. ACR North American Advances.

Higgins, E. T. (2002). How self-regulation creates distinct values: The case of promotion and prevention decision making. Journal of Consumer Psychology, 12(3), 177-191.

Howard, D. J., Shu, S. B., & Kerin, R. A. (2007). Reference price and scarcity appeals and the use of multiple influence strategies in retail newspaper advertising. Social Influence, 2(1), 18-28.

Hutter, B. M. (1997). Compliance: Regulation and environment. Oxford University Press.

Jung, J. M., & Kellaris, J. J. (2004). Cross-national differences in proneness to scarcity effects: The moderating roles of familiarity, uncertainty avoidance, and need for cognitive closure. Psychology & Marketing, 21(9), 739-753.

Keillor, B. D., Parker, R. S., & Pettijohn, C. E. (1999). Sales force performance satisfaction and aspects of relational selling: Implications for sales managers. Journal of Marketing Theory and Practice, 7(1), 101-115.

Kim, Y. J. (2006). The role of regulatory focus in message framing in antismoking advertisements for adolescents. Journal of Advertising, 35(1), 143-151.

Knowles, E. S., & Linn, J. A. (Eds.). (2004). Resistance and persuasion. Psychology Press.

Ku, H. H., Kuo, C. C., & Kuo, T. W. (2012). The effect of scarcity on the purchase intentions of prevention and promotion motivated consumers. Psychology & Marketing, 29(8), 541-548.

Lindenberg, S., & Steg, L. (2007). Normative, gain and hedonic goal frames guiding environmental behavior. Journal of Social issues, 63(1), 117-137.

Leibenstein, H. (1950). Bandwagon, snob, and Veblen effects in the theory of consumers' demand. The quarterly journal of economics, 64(2), 183-207.

Lim, N. (2016). Cultural differences in emotion: differences in emotional arousal level between the East and the West. Integrative Medicine Research, 5(2), 105-109.

Lystig Fritchie, L., & Johnson, K. K. (2003). Personal selling approaches used in television shopping. Journal of Fashion Marketing and Management: An International Journal, 7(3), 249-258.

Lynn, M. (1992). The psychology of unavailability: Explaining scarcity and cost effects on value. Basic and Applied Social Psychology, 13(1), 3-7.

May, P. J. (2004). Compliance motivations: Affirmative and negative bases. Law & Society Review, 38(1), 41-68.

Nichols, B. S. (2012). The development, validation, and implications of a measure of consumer competitive arousal (CCAr). Journal of Economic Psychology, 33(1), 192-205.

Oruc, R. (2015). The Effects of Product Scarcity on Consumer Behavior: A Meta-Analysis (Doctoral dissertation, Europa-Universität Viadrina Frankfurt).

Parker, C. (1999). How to win hearts and minds: corporate compliance policies for sexual harassment. Law & Policy, 21(1), 21-48.

Parker, C. (2006). The "compliance" trap: The moral message in responsive regulatory enforcement. Law & Society Review, 40(3), 591-622.

Reno, R. R., Cialdini, R. B., & Kallgren, C. A. (1993). The transsituational influence of social norms. Journal of personality and social psychology, 64(1), 104.

Rojell, E. J., Pettijohn, C. E., & Parker, R. S. (2006). Emotional intelligence and dispositional affectivity as predictors of performance in salespeople. Journal of Marketing Theory and Practice, 14(2), 113-124.

Schindler, R. M. (1998). Consequences of perceiving oneself as responsible for obtaining a discount: evidence for smart-shopper feelings. Journal of consumer psychology, 7(4), 371-392.

Sensenig, P. E., & Cialdini, R. B. (1984). Social psychological influences on the compliance process: Implications for behavioral health. Behavioral health: A handbook of health enhancement and disease prevention, 384-392.

Simpson, S. S. (2002). Corporate crime, law, and social control. Cambridge University Press.

Snyder, C. R. (1992). Product scarcity by need for uniqueness interaction: a consumer catch-22 carousel?. Basic and applied social psychology, 13(1), 9-24.

Stevenson, A. (Ed.). (2010). Oxford dictionary of English. Oxford University Press, USA.

Tyler, T. R. (2006). Psychological perspectives on legitimacy and legitimation. Annu. Rev. Psychol., 57, 375-400.

Van Herpen, E., Pieters, R., & Zeelenberg, M. (2009). When demand accelerates demand: Trailing the bandwagon. Journal of Consumer Psychology, 19(3), 302-312.

Wenzel, M. (2004). The social side of sanctions: Personal and social norms as moderators of deterrence. Law and human behavior, 28(5), 547-567.

Wenzel, M. (2005). Motivation or rationalisation? Causal relations between ethics, norms and tax compliance. Journal of Economic Psychology, 26(4), 491-508.

Wicklund, R. A. (1974). Freedom and reactance. Lawrence Erlbaum.

Worchel, S., Lee, J., & Adewole, A. (1975). Effects of supply and demand on ratings of object value. Journal of personality and social psychology, 32(5), 906.

APPENDIX

Appendix 1: Preliminary Master Thesis Report

Preliminary Master Thesis Report

Hand-in date:

16.01.2017

Campus:

BI Oslo

Programme:

Master of Science in Strategic Marketing Management

Table of content

Preliminary Master Thesis Report

1.   Introduction

Scarcity appeals are one of the most widely marketing strategies used in advertising and promotion in mass media channels (Howard et al. 2007). A recent research has shown that one in every fifth (20.3%) retail advertisements in newspapers contains a scarcity appeal, which is a much larger figure than the less than 6.7% prevalence of reference pricing in advertising (Howard et al. 2007). Furthermore, Fritchie and Johnson (2003) used the six main principles of persuasion classified as reciprocation, social proof, commitment and consistency, liking, authority and scarcity by Cialdini (1984) as the coding scheme for TV advertisement. The order of principles preference from his research is social proof (35.5%), followed by scarcity (28.4%), authority (18.4%), commitment and consistency (9.1%), liking (6.1%) and reciprocation (2%). Based on these all figures, it is undoubted that scarcity techniques have been widely accepted and used in practice.

Moreover, in the academic literature, scarcity effects have been researched for a long time and have been proved for its effectiveness in attracting individual attention with a great deal of researches. Based from the early finding from Lynn (1992) that scarcity affects consumers' perceptions of goods by enhancing attractiveness and desirability, other researchers have developed their research to explore more important effects of scarcity. Van Herpen et al. (2007) found that need for uniqueness (NFU) increased preference for scarce products caused by limited supply. Gierl and Huettl (2010) found the relationship between quantity scarcity either due to limited supply or excess demand and attitude toward the products. Perceived scarcity has been demonstrated to have a positive impact on assumed expensiveness, which in turn, has a positive impact on perceived quality (Chen and Sun 2014; Wu and Hsing 2006; Wu et al. 2012). Moreover, the effect of scarcity on willingness to pay is positive according to Lee and Seidle (2012) and Robinson (2011). With this paper, we are going to identify important gap in the literature as well as develop a more comprehensive framework in scarcity effects. In addition, new research methodology by collaborating with an e-commerce website will provide more insightful findings to marketers.

1.1 Research Questions

The scarcity effect is a powerful social-influence phenomenon, utilized by marketers as a means to increase the subjective desirability of products (Cialdini 1993; Jung and Kellaris 2004). Thus, scarcity is a popular concept in consumer behavior research. Although a great deal of researches on scarcity effect has been done, they still showed some limitations and disagreements.

1.1.1 Scarcity on E-commerce setting

Over the past few years, several e-commerce business such as the booking sites in the travel industry have implemented different scarcity messages on their communication campaigns as well as in their sales promotions with the aim of having an increase on sales. According to Total retail Survey, 2016 by PwC, approximately 7.1% of research participants in 2015 shop online daily, compared with only 2.9% in 2012. Especially, almost one in five of surveyed Chinese consumers shops online on a daily basis. Over Thanksgiving weekend roughly 103 million Americans shopped online and accounted for almost a third (29%) of total sales—up 12% over 2014. From this statistics, ecommerce is undoubtedly getting popular nowadays.

E-commerce setting opens a new way to communicate with customers. Customers now can easily compare offers, observe real time demand and supply and sharply perceive more competition from other shoppers. Marketers can employ scarcity technique in different way in which they can combine different types of scarcity to get attention from customers. It is very popular in e-commerce to use more than 1 messages of scarcity at one time, for example, customers can see messages like "high demand", "only 5 rooms left", "booked 67 times today", etc. However, none of research on scarcity investigates the joint effect of different scarcity types on customer behaviors. Furthermore, customers nowadays will received lots of messages, promotion emails online which aim at increasing customers' awareness and knowledge. For this reason, an effective mailing campaign has to get high response rate. Since then, we are going to investigate the effect of scarcity messages on response rate of customers in a mailing campaign which has never been done by any research. Our first research question is:

Research question 1: How does scarcity message influence response rate in a mailing campaign?

Research question 2: How does different type of scarcity jointly interact to affect customers' behaviors?

1.1.2 Customer motivation

Ku et al. (2012) use Regulatory focus theory (Higgins 1997) to manipulate customer motivation which emphasis on promotion-focused and prevention-focused. The research finds out that with the same product of Notebook, when customers are primed with Promotion appeal - "Buy the Brand X notebook to get an upgrade. Brand X contributes to the enhancement of work performance." or Prevention appeal - "Buy the Brand X notebook to avoid a bad choice. Brand X notebook can help reduce the risk of seeming unprofessional", customers will experience different effect of scarcity messages on purchase intention. In the other words, customer motivation plays an important role in explaining and moderating the effect of scarcity messages on customer behaviors.

However, recent development in customer motivation has explored a more comprehensive multi-dimension of customer motivation including three main dimensions of gain goal, hedonic goal and normative goal. These dimensions are superior to Regulatory focus theory since it integrates social norms and morality which nowadays become more prevalent due to the fact that internet and social media enable people to compare with others much easier. Understanding customer motivations in purchasing decision comprehensively enable marketers to leverage their marketing tools more effectively. We expect that with that new development in literature, the moderator effect of customer motivation in the relationship between scarcity and purchase intention will be estimated with more validity and reliability. From this point, our next research question is:

Research Question 3: How do customer motivations moderate the relationship between different types of scarcity messages and purchase behaviors?

1.1.3 The mediation effect of consumer competition

Gupta (2013) used competitiveness as personal traits which moderate the effect of scarcity on purchase intention while Aggarwal et al (2011) used consumer competition as a mediator in the relationship between scarcity and purchase intention. In his research, Gupta (2013) found that the level of competitiveness in each person representing in desire to win and be better than others will moderate the relationship between perceived scarcity and urgency to buy, in-store hoarding, in-store hiding. It is explained that achieving something scarce will signify the

owner's victory, self-image enhancement as well as differentiating themselves from others. In the other words, when people have a high level of competitiveness, they always want to be better than others and goods under scarcity become more valuable since they bring them the feeling of achievement and superior when they gain it.

On the other hand, Aggarwal et al (2011) illustrate competition as an external factor that mediate the relationship between scarcity and purchase intention. They found that scarcity messages can cause consumer competition which is defined as the act of a consumer's striving against one or more consumers for the purpose of achieving a desirable economic or psychological reward. Limited promotional offers will cause scarcity, which creates among customers a sense of "smart shoppers" (Babakus, Tat, and Cunningham 1988). The offers now is not only about monetary value but aslo hedonic utility in which customers achieve the feeling of winning and better against others. That hedonic utility arising from perceived consumer competition will increase the purchase intention. From these two researches, there is still some unclear mechanism in the way competition can affect the relationship between scarcity and customer behaviors that has a very important implication for marketer since under competition, customers can come up with higher purchase intention which in turn bring financial benefit to the company. Based on this gap, we have the following research question:

Research Question 4: How consumer competition can affect the relationship between scarcity and purchase intention?

1.2 Research Motivation

Over the last decades, since scarcity effect is a promising and attractive field in consumer behaviors research, it has attracted increasing attention and efforts from scholars as well as marketing and sale managers. However, there are still some important gaps in the literature as discussed above so it calls for further researches. Furthermore, almost all researches conduct survey-based researches or laboratory-based researches but no field experiment. In addition, there are no dependent variables capturing the actual customers' behaviors such as response rate and purchase rate. Thus, we are looking forward to contribute to this research by carrying out a field research collaborating with an e-commerce retailer named TheNorwayshop. If scarcity messages are proved to have a significant effect on purchase rates or response rate in an advertising or promotion campaign, it may

bring an important implication for marketing managers to boost up customer awareness as well as the sale volume.

The following parts will be structured as follows:

- Literature review
- Theoretical frameworks
- Methodology
- Timeline

2.   Literature Review

2.1   Scarcity

After reviewing great variety of researches in the field, we find out that no official definition for Scarcity is given by academic institutes such as American Marketing Association. Researchers provide different definition and description for scarcity. For purposes of this study, the definition for Scarcity that will be used is taken from Oruc (2015) which can be defined as Scarcity is a condition or message that communicates a certain or potential unavailability of a product in the future along with the availability of a product in the present, all of which are directed at all possible recipients of a product. This definition clarifies all the restrictions of scarcity in marketing field. First, product scarcity is a potential unavailability of the offer in the future, not in the present. Second, product scarcity message or condition is not only limited to a group of customers but to all possible recipients.

Cialdini (1984) illustrated scarcity concept by providing two tactics of scarcity. First, limited-number tactic is "when the customer is informed that a certain product is in short supply that cannot be guaranteed to last for long" (Cialdini, 1984). Second, deadline technique refers to a tactic "in which some official time limit is placed on the customer`s opportunity to get what the compliance professional is offering" (Cialdini, 1984). This definition does not mention to the target recipient of scarcity messages, which can be used for only a group of customers such as for only economy class member but not for business class member. For this loose restriction, Cialdini's definition is not suitable for our study. Furthermore, Ku et al. (2012) did not provide the definition of scarcity but used the definition of quantity scarcity from Gierl, Plantsch, & Schweidler (2008) in which quantity scarcity is a possible consequence of changes in demand or supply. This definition only focuses on quantity scarcity which ignores the presence of time scarcity. Furthermore, it does not highlight the restriction of present availability and future unavailability. For this reason, it is also not matched with our study.

2.2   Supply-based Scarcity vs Demand-based scarcity

Scarcity has been researched widely in the literature. Scarcity has been researched widely in the literature. Cialdini (2009) proposed a quite comprehensive classification of scarcity. There are two types of scarcity messages commonly

employed in practice: limited-time and limited-quantity. First, in a limited-time scarcity (LTS) message, the offer is made available for a predefined period, after which the offer becomes unavailable. Similarly, Gierl et al. (2009) also defined the same concept of "Time scarcity" under the name of "Scarcity due to supply" which arises when suppliers restrict the offer or availability of products to a certain period of time. Second, a limited-quantity scarcity (LQS) (Cialdini 2009) arises when promotional offer is made available for a predefined quantity of the product. This occurs when the retailer deliberately controls the supply of a predefined quantity of the product in the marketplace, i.e. supply is limited intentionally. However, this classification neglects the scarcity caused by demand side as mentioned in the research by Gierl et al. (2008).

Quantity scarcity has been widely accepted as a possible consequence of changes in demand or supply (Gierl et al. 2008). From this general concept, scholars have proposed different approach to Scarcity dimensions with diverse definition. One of these dimensions is referred to the demand side, so-called "Demand Scarcity". Gierl et al. (2008) defined this dimension of Scarcity with the proposed term "Scarcity in quantity due to demand" which illustrates that Demand Scarcity arises when supply fails to meet market demand. Suppliers may announce this scarcity to the market by means of such claims as how many sales have already been made, or stating that there are only few units left in stock as well as only some units in stock.

Ku et al. (2012). have also contributed to the literature in the Demand Scarcity dimension which is defined as "Demand Scarcity results from consumer demand outstripping supply" what can be explained as when the market demand is higher than the goods offered by a supplier. Besides that, Herpen, Pieters, & Zeelenberg (2005) proposed the "Scarcity due to excess demand" which has similar concept with other definitions related to demand. With this scarcity, customers will experience the circumstance in which they watch others consumers acquire the product they desire. In the study by Gupta (2013), "demand side scarcity" arises when the retailer does not limit the supply of the product but the scarcity arises due to factors like high demand for the product thus leading to stock depletion, i.e., demand exceeding supply. In addition, Demand-related scarcity differs from supply-related scarcity in the sense that they are market-driven and not under marketers` control (Aguirre-Rodriguez 2013).

Hence, based on the literature and for the purpose of this study we use the term "Demand-based scarcity" which can be defined as the Scarcity arising from demand side due to the number of people who are interested in acquiring or already purchased a specific product. (I.e. Number of people watching this product, number of people who bought the product today). (Gupta 2013; Gierl et al. 2008; Ku et al. 2012; Herpen et al. 2005).

Another relevant dimension of Scarcity mentioned in literature and is important for our research is "Supply Scarcity". Gierl et al. (2008) proposed "Scarcity in quantity due to supply" which is controlled by the suppliers who limit the number of available units to customers (e.g.,Only 100 units of this product will be supplied).Similarly, Ku et al. (2012). Defined Supply Scarcity, as the "results from a limitation on the available units caused by the vendor". In other words, it means that it occurs when the goods offered by a supplier are limited for the market. Hereby, for the purpose of this study we suggest to represent "Supply Scarcity" with the term "Supply-based scarcity" which is defined as the scarcity arise from the communication to potential customers of limited number of available units of product due to suppliers' deliberated strategy (e.g., Only 5 units available due to corporate strategy) (Cialdini 2008; Gupta 2013; Gierl et al. 2008; Ku et al. 2012; Herpen et al. 2005).

Basing on above literature review, our study will focus on Quantity Scarcity, including Demand-based scarcity and Supply-based scarcity. From this two type of scarcity, we argue that there are 3 main different ways of scarcity communication which can be employed by marketers. Firstly, it can be pure Demand-based scarcity (E.g., "Almost out of stock due to 100 purchases made today"), pure Supply-based Scarcity (E.g., "Only 5 units available due to limited supply) and Supply-Demand-based scarcity together (E.g., "Only 5 units available and 100 purchases made today").

2.3   Purchase intention in E-commerce

Purchase intention and Perceived value are two well-known dependent variables in scarcity effect researches. In literatures, the effects of scarcity on these two variables are often moderated or mediated by other factors. The relationship between Scarcity and purchase intention is mostly moderated by customer motivation (Ku et al. 2012), need for cognitive closure and uncertainty avoidance (Jung and Kellaris 2004), brand familiarity (Castro 2010; Jung and Kellaris 2004)

and mediated by value perception (Eisend 2008), perceived competition (Aggarwal et al. 2011).

Meng Zhu and Rebecca K. Ratner (2015) have an interesting research on the effect scarcity versus abundant on choice share and liking rate of consumer' favorite items among consideration set. In the research, participants are randomly assigned to one of two supply-level condition: scarce and abundant. Participants have to rank 5 yogurt flavors on a five-point scale. Then, participants will rate how much they like each of these five yogurt flavors on 100-point scale. Finally, participants will decide how many units of each flavor they want to buy to get total 4 yogurts. The results show that scarcity versus abundance broadens the discrepancy between the liking of the favorite and non-favorite items and leads to a greater choice share of the favorite item. The finding is explained as when something that people like is less available, they become physically agitated, such that their focus narrows, emotions rise, and cognitive processes are often suppressed by "brain-clouding arousal." (Cialdini, 2009). Moreover, recent researches show that that arousal polarizes subsequent judgments of evaluative targets by reducing attentional capacity, facilitating utilization of primary evaluative cues while restricting utilization of secondary non evaluative cues (Easterbrook 1959; Mandler 1975; Mano 1992, Paulhus and Lim 1994). From the results, we can find out that scarcity condition make the favorite items become more attractive, higher liking rate, and moreover, increase the purchase intention for the favorite items.

Aggarwal et al. (2011) found that consumer competition mediate the effect of scarcity messages on purchase intentions. In this study, consumer competition is defined as the act of a consumer's striving against one or more consumers for the purpose of achieving a desirable economic or psychological reward. They argued that people seem to engage in interpersonal comparisons that involve two types of utility: (1) nonsocial utility, coming from the value of the offers; and (2) social utility, arise from comparison with other offers which other customers are able to access (Bolton and Ockenfels 2000; Greenberg 1986). The total utility of an offer is the sum of nonsocial utility and social utility. Since desire to win a competition with others in achieving a better offer will increase the social utility of the offer, total utility of the offer increase, which makes the offer become more attractive to customer. Based on this argument, scarcity will generate a stronger effect on

purchase intention when the person finds him- or herself in direct competition with other consumers. However, this study focused only on limited-time messages and limited-quantity messages which are both generated from supply side but ignore the demand-based scarcity messages.

2.4   Customers motivation

"Regulatory focus theory" (Higgins 1997) classifies consumers' goals as being either promotion-focused or prevention-focused. The former are concerned with attaining such positive outcomes as advancement and achievement, the latter with avoiding negative outcomes with respect to protection and safety (Micu & Chowdhury 2010; Mourali, Bockenholt, & Laroche 2007). Kim (2006) suggests that goal orientation plays an important role in determining the responses to persuasion attempts. More specifically, attitude toward a product is more favorable when product benefits match individual goal (Aaker & Lee, 2001; Cesario, Grant, & Higgins, 2004; Chernev, 2004). Based on regulatory focus theory and these arguments, Ku et al. (2012) have investigated the joint effect of consumers` motivational orientations (prevention focus vs. promotion focus) and reason for scarcity.

The research finds that prevention-focused respondents reported higher purchase intention scores when the product was demand-scarce compared to when it was supply-scarce. They argues that prevention-focused consumers who favor vigilance and avoidance of mistakes are expected to avoid products that are exclusive due to limited supply, because there is no clue of the buying behavior from other consumers. The choice of such an "extreme" option may contradict the orientation of risk aversion. However, under demand scarcity, prevention-focused consumers have evidence that lots of other consumers have bought it which serves as "social proof mechanism" meaning that consumers trust others opinions on the evaluation of the product quality Cialdini and Goldstein (2004). Furthermore, the study shows that promotion-focused participants responded positively only to supply scarcity because promotion-focused consumers be attracted by unavailable products caused by limited supply that means not many people can own it so that they can seize the opportunity to gain higher social status (Lynn, 1992) and uniqueness (Snyder, 1992).

Siegwart Lindenberg and Linda Steg (2007) proposed new developments in goal-dependent framing and multiple goal frames (sometimes also called "multiple

motives"). They introduce goal-framing theory, which postulates that goals "frame" the way people process information and act upon it. Three goal frames are distinguished: a hedonic, gain, and normative goal frame. In short, at any time, one goal is focal and influences the cognitive process the most (i.e., it is a goal frame), while other goals are in the background and increase or decrease the strength of the focal goal. The central idea is that goals govern or "frame" what people attend to, what knowledge and attitudes become cognitively most accessible, how people evaluate various aspects of the situation, and what alternatives are being considered. For example, a message "This machine will save you $50 per months as the results of energy-saving" will activate the gain goal which deals with the change in personal resources, in this case attitude and knowledge about saving, money will be activated and more accessible.

Recent research conducted by Barbopoulos & Johansson (2016). Provides new dimensions of consumer motivation. The (multi-) dimensionality of the gain, hedonic and normative master goals that is considered as important drivers of consumer behavior, has been classified into five sub-goals. Gain Goal is linked to Thrift and Safety sub-goals. Thrift sub-goal is related to the consumer economic motivations, as an example, Barbopoulos & Johansson (2016) mentioned that consumers in this dimension will seek for rebates, deals or any discounts. On the other hand, the Safety sub-goal is related to seek safety, harmony and stability. Under safety sub-goal, customers try to avoid all possible risks in purchase situations (Barbopoulos & Johansson 2016). At the same time, both thrift and safety sub-goals are seeking the financial security by maximizing the cost-benefit relationship (Barbopoulos & Johansson 2016). The normative goal is explained by the moral and social norms. Both dimensions are associated with the "Sensitivity how one "ought" to act, according to personal norms, the opinions of others and the society as a whole" (Barbopoulos & Johansson 2016). While the moral norms focus on the ethical aspects, ideals and moral obligations, social norms consider the social aspects and gaining prestige such as social status (Barbopoulos & Johansson 2016). The last dimension, instant gratification, it is related to the hedonic goal. This sub-goal concerns about "striving for satisfaction and comfort" (Barbopoulos & Johansson 2016).

For purposes of this study, these five sub-dimensions will be used to measure the main three goals frame. This will enable us to research how customer motivations

can moderate the relationship between different types of scarcity messages and purchase behaviors.

3.   Theoretical Framework

Reactance theory focuses on an individual's reaction to the loss of perceived freedom. According to reactance theory, if an individual's freedom is threatened or eliminated, s/he experiences psychological reactance, which is a motivational state directed toward safeguarding a person's behavioral freedom (Brehm 1966; Clee and Wicklund 1980; Wicklund 1974). Brehm's (1972) added "The basic idea of the theory is that a person is motivationally aroused any time he thinks one of his freedoms has been threatened or eliminated. This motivational arousal, moves a person to try to restore his freedom." Recent research on reactance theory has modeled and measured reactance psychological which cannot be measured by Brehm 1966. Dillard and Shen (2005) found that anger and negative cognitions are empirically inseparable components (intertwined process model) of reactance, that finding is also in line with the statement of Brehm 1966 that individuals experiencing psychological reactance could "be aware of hostile and aggressive feelings". It can be seen that perceived threaten freedom will cause anger and negative cognition in recipient which constitute psychological reactance. Reactance then affects attitude and behavior intention in the way to restore the established freedom. In the other words, this motivation leads to an intensified desire to accomplish the restricted behavior and simultaneously increases its perceived attractiveness (Brehm and Brehm 1981).

Furthermore, a product's limited availability can bring a threat or loss of personal freedom on choosing the offer, thus it may trigger psychological reactance that leads to increased attention to the limited goods, and ultimately, increased consumer motivation to obtain the alternative that is no longer fully accessible (Ditto and Jemmott 1989; Markus and Schwartz 2010; Worchel and Brehm 1971). When the limited offers become more attractive to customers, they are more willing to know more about the offer and respond to the offers.

H1: Scarcity appeals increase the rate of response in promotion offer.

Gain goal frame put more weight on variation in cost and perceived value which associates to economic motivations in customers' purchase decision while concerns about emotional, social or ethical consequences are of lesser importance (Lindenberg and Steg 2007). In addition, gain goal frame deals with threats to

one's financial security. Furthermore, in the study of (Barbopoulos & Johansson 2016). Gain goal is related to 2 distinct dimensions, Thrift and safety which concern about a safe choice regarding cost-effective, price conscious way as well as a wise use of money. On the other hand, consumers interpret demand that has outstripped supply as evidence of the quality of the product in question (Worchel et al. 1975; Van Herpen et al. 2009) since high demand is seen as lots of good evaluations from other buyers. For this reason, when gain goal is activated, demand-based scarcity will have more impact on customers' behaviors.

H2: Gain Goal frame increase the effect of demand-based scarcity on purchase intention.

Hedonic goal emphasizes more on changes in pleasures, mood as well as energy levels and less on price consciousness and economic utility (Lindenberg and Steg, 2007). This goal master deals with pleasures and excitement, as well as avoidance of effort and negative feelings. On the other hand, since limited supply is taken to imply exclusivity, consumers value the possession of rare products as a means to emphasize their own "uniqueness" (Snyder 1992) and attain social status (Lynn 1992) which associates with excitement and pleasures. From this point, we argue that when hedonic goal is activated, the effect of supply-based scarcity messages on customers' behaviors will be stronger.

H3: Hedonic Goal frame increase the effect of supply scarcity on purchase intention.

Normative goal associates with a heightened sensitivity how one ought to act, according to personal norms, the opinions of others and the society as a whole (Lindenberg and Steg 2007). The normative goal makes customers focus on morality, social standards and how others act. It seems to be clear that normative goal is linked to demand scarcity and increase the effect of demand scarcity on purchase intention.

H4: Normative Goal frame increase the effect of demand scarcity effect on purchase intention.

Nichols (2012) proposed the term "consumer competitive arousal" as "Feelings and thoughts regarding the competitive nature of a purchase situation, and the belief that one would need to compete with other buyers to achieve a goal in a particular buying situation". In the research, scarcity is fundamental to the concept

of competition, which plays a big role in measuring consumer competitive arousal. In addition, researchers agree that scarcity implies competition, and successfully obtaining something scarce signifies that one has won the competition (Knowles & Linn 2004).

Cialdini (2008) suggests that not only do people want an item more when it is scarce but they want it most when they are in competition for it. Obtaining a bargain becomes more like "winning" a bargain (Bawa and Shoemaker 1987), where the bargain provides both utilitarian as well as hedonic fulfillment (Garretson and Burton 2003). Schindler (1989) explains this joy-of-winning as a "pride-like satisfaction of having won in an implied game . . . against other consumers". In order to incorporate the psychology of buying into the model of evaluating transactions, Thaler (1985) postulated the concept of transaction utility and acquisition utility as two kind of utility. Acquisition utility relates to economic side of the transaction, net utility that accrues from the trade of price p to obtain the product z. Transaction utility depends on the actual price p compared to some reference price, p*. The higher the price p compares to reference price, the less the transaction utility gains. In order to maximize utility, people tend to lower the price p compared with reference price. On the other hand, reference price can be obtained by looking at other people's offers. Thus, in limited promotional offer situation, scarcity creates a competition among potential customers to gain the best offer in order to maximize their offer's total utility.

Based on these arguments, we propose the fifth hypothesis as follow:

H5a: Perceived competition mediate the relationship between supply-based scarcity and purchase intention.

H5b: Perceived competition mediate the relationship between demand-based scarcity and purchase intention.

Furthermore, we are going to estimate the interaction effect of demand-based scarcity and supply-based scarcity on perceived competition. We estimate that each types of scarcity separately provide only one clue and evidence for the perception of competition among customers. Because consumer competition only occurs if two conditions happen together that is limited supply and high demand. If only one condition appears, for example limited supply, customers have only one clue or evidence for the assumption of competition among consumers. However, if two conditions are presented clearly, customers will have a sharp

perception about the competition. From this estimation, we propose the last hypothesis:

H6: There is an interaction effect between demand-based scarcity and supply-based scarcity in the relationship with perceived competition among buyers.

Diagram 1: Scarcity effect framework
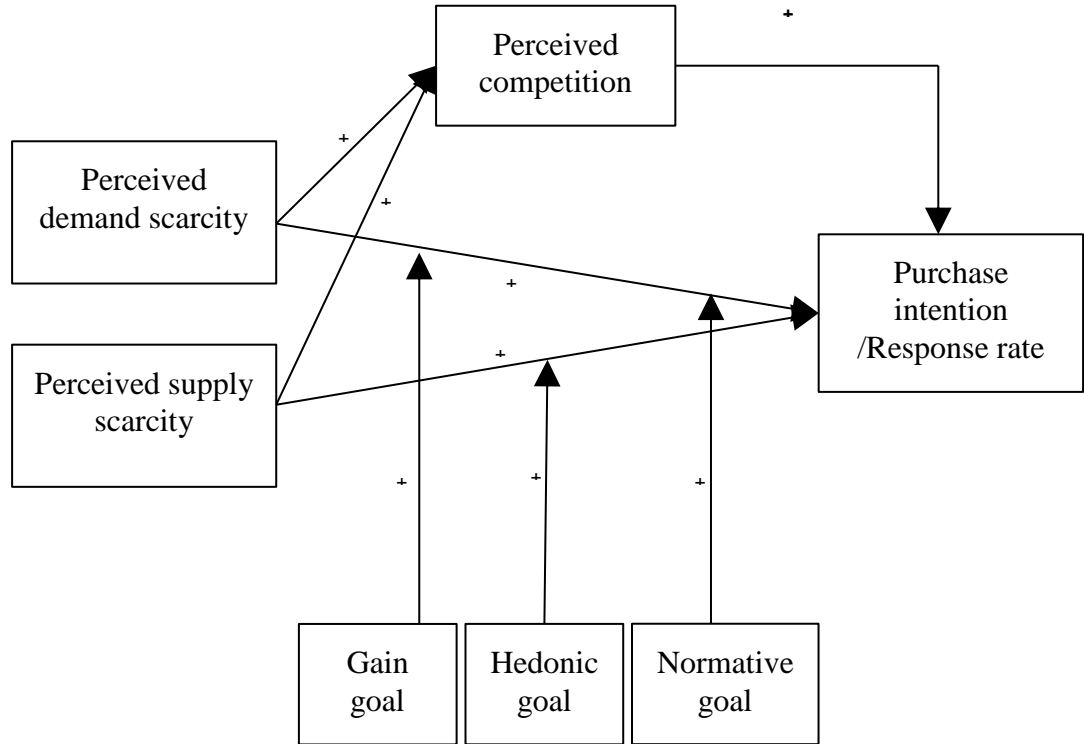
4. Methodology
4.1 Experiment 1

Experiment 1 will be conducted to test the hypothesis H1.

H1: Scarcity appeals increase the rate of response in promotion offer.

- Identification of samples:
  NorwayShop customers base with 1000 emails
- Methodology and methods:
  Email campaign will be carried out with 1000 customers. They will be randomly divided into 3 groups with 3 types of messages: No-scarcity message, Demand-based scarcity and Supply-based scarcity messages respectively. The response rate will be measure for each group.
- Measurement:
  The email campaign will be track and measure which email account open the mail and which click on the link of product inside the mail.

Response rate will be measure by number of recipients clicking divided by the number of recipients who open the mail.

Then we use one-way ANOVA with Bonferroni test to test the hypothesis.

4.2 Experiment 2

Experiment 2 will be conducted to test the hypotheses H2, H3 and H4.

- Identification of samples:

  A group of 100 students will be collected to do a survey-based research.

- Methodology and methods (Between-subject and Within-subject research)
  - Step 1: Participants will be randomly allocated to one of 4 groups in which they will be primed with different goal frames: Gain Goal, Hedonic Goal and Normative Goal and Control group.
  - Step 2: After goals are activated, participants will evaluate each offers regarding their purchase intention. There will be 2 offers with supply scarcity messages, demand scarcity message.
  - The results will be analysis with N-way ANOVA with dependent variable as purchase intention and 2 categorical independent variables as each Goal frame and each scarcity message.

- Measurement:

  Purchase intention measurement scale will be adopted from Aggarwal et al (2011). Purchase intention will be measured using an average of two, seven-point scales:

  If you were in the market to buy this product, how likely are you to buy the advertised product?

  1 = "not likely to purchase at all," 7 = "very likely to purchase"

  If I were in the market to buy this product, I would consider buying the advertised product:

  1 = "definitely not buy," 7 = "definitely buy".

4.3 Experiment 3

Experiment 3 will test the hypothesis H5a and H5b.

- Identification of samples:

  Group of 100 participants will be collected.

- Methodology and methods
  - Step 1: There will be 2x2 design of combining different level of supply and demand scarcity messages (Yes/No)
  - Step 2: Participant will evaluate their perception on supply scarcity level and demand scarcity level of each offer.
  - Step 3: Participant will evaluate their perception of competition level in each offer.
  - Step 4: Participant will evaluate their purchase intention in each offer.
  - The data will be analyzed with Sobel Test proposed by Baron and Kenny (1986) with following equations:
- Purchase intention = a1+ b1*Perceived Supply-based Scarcity +c1*Perceived Demand-based Scarcity
- Perceived Competition = a2 +b2* Perceived Supply-based Scarcity +c2*Perceived Demand-based Scarcity + d2 *Perceived Supply-based Scarcity * Perceived Demand-based Scarcity
- Purchase intention = a3 + b3* Perceived Supply-based Scarcity + c3* Perceived Demand-based Scarcity + d3* Perceived Competition
- Measurement: Developed from scarcity definition and
  - Perceived Supply-based Scarcity and Perceived Demand-based Scarcity

Participants were instructed to respond to a statement adopted from a study by Eisend (2008), "How available do you think Product X is", on a seven-point scale anchored by "rather inadequate" and "rather adequate". In both demand- and supply-generated scarcity conditions, participants who perceived the availability of the product to be relatively inadequate (score, 4) were further asked to identify the stated cause of the scarcity: heavy demand or limited supply.

  - Perceived Competition: Adopted from Nicolas 2012
- I felt like I was competing with others
- I was trying to buy something that others were also trying to buy
- Other shoppers were rivals of mine
- After shopping for this item, I felt like I had "won"∗∗

- Other people who were shopping for this item "lost" if they were not able to buy it
- It felt like a battle with other shoppers when I was trying to buy this item
- I needed a strategy or game plan when I was trying to buy this item
- Trying to buy this item was a competition
- I felt successful after shopping for this item**
- I felt a lot of anxiety about being able to buy this item
  - Purchase intention: will be measured as same as in the Experiment 2.

5.   Timeline

After the hand-in of this preliminary report, we will endeavor following the plan described below.

January:

16th: deadline preliminary report

Continue with the literature review

Clarify the research question and hypotheses

February:

Finalize methodology and requirement of necessary data

March:

Work with TheNorwayShop to plan the experiment with their E-commerce website.

Design and conduct the survey research.

April:

Data analysis

Discuss observations with supervisor, and adjust data accordingly. Interpret and write about findings.

May:

Write the thesis

June:

Hand in the first draft

July:

Hand in the second draft

August

31st: Submit the final thesis

References

Aaker, J. L., & Lee, A. Y. (2001). "I" seek pleasures and "we" avoid pains: The role of self-regulatory goals in information processing and persuasion. Journal of Consumer Research, 28(1), 33-49.

Aggarwal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity messages. Journal of Advertising, 40(3), 19-30.

Aguirre-Rodriguez, A. (2013). The effect of consumer persuasion knowledge on scarcity appeal persuasiveness. Journal of Advertising, 42(4), 371-379.

Barbopoulos, I., & Johansson, L. O. (2016). A multi-dimensional approach to consumer motivation: exploring economic, hedonic, and normative consumption goals. Journal of Consumer Marketing, 33(1), 75-84.

Bawa, K., & Shoemaker, R. W. (1987). The coupon-prone consumer: some findings based on purchase behavior across product classes. The journal of marketing, 99-110.

Brehm, J. W. (1966). A theory of psychological reactance.

Brehm, S. S., & Brehm, J. W. (2013). Psychological reactance: A theory of freedom and control. Academic Press.

Bolton, G. E., & Ockenfels, A. (2000). ERC: A theory of equity, reciprocity, and competition. American economic review, 166-193.

Castro, I. A. (2010). There's Only One Left, Do I Want It? The Effects of Brand and Display Characteristics on Purchase Intentions for Scarce Products (Doctoral dissertation, Arizona State University).

Cesario, J., Grant, H., & Higgins, E. T. (2004). Regulatory fit and persuasion: Transfer from" feeling right.". Journal of personality and social psychology, 86(3), 388.

Chen, H. J., & Sun, T. H. (2014). Clarifying the impact of product scarcity and perceived uniqueness in buyers' purchase behavior of games of limited-amount version. Asia Pacific Journal of Marketing and Logistics, 26(2), 232-249.

Chernev, A. (2004). Goal-attribute compatibility in consumer choice. Journal of Consumer Psychology, 14(1), 141-150.

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. Annu. Rev. Psychol., 55, 591-621.

Cialdini, R.B. (1984). Influence: The Psychology of Persuasion. William Morrow, New York.

Cialdini, R.B. (1993). Influence: Science and Practice. Harper Collins, New York.

Cialdini, R. B. (2009). Influence: Science and practice (Vol. 4). Boston, MA: Pearson Education.

Clee, M. A., & Wicklund, R. A. (1980). Consumer behavior and psychological reactance. Journal of Consumer Research, 6(4), 389-405.

Dillard, J. P., & Shen, L. (2005). On the nature of reactance and its role in persuasive health communication. Communication Monographs, 72(2), 144-168.

Ditto, P. H., & Jemmott, J. B. (1989). From rarity to evaluative extremity: effects of prevalence information on evaluations of positive and negative characteristics. Journal of Personality and Social Psychology, 57(1), 16.

Easterbrook, J. A. (1959). The effect of emotion on cue utilization and the organization of behavior. Psychological review, 66(3), 183.

Eisend, M. (2008). Explaining the impact of scarcity appeals in advertising: The mediating role of perceptions of susceptibility. Journal of Advertising, 37(3), 33-40.

Garretson, J. A., & Burton, S. (2003). Highly coupon and sale prone consumers: benefits beyond price savings. Journal of Advertising Research, 43(02), 162-172.

Gierl, H., & Huettl, V. (2010). Are scarce products always more attractive? The interaction of different types of scarcity signals with products' suitability for conspicuous consumption. International Journal of Research in Marketing, 27(3), 225-235.

Gierl, H., Plantsch, M., & Schweidler, J. (2008). Scarcity effects on sales volume in retail. The International Review of Retail, Distribution and Consumer Research, 18(1), 45-61.

Greenberg, J. (1986). Determinants of perceived fairness of performance evaluations. Journal of applied psychology, 71(2), 340.

Gupta, S. (2013). The Psychological Effects of Perceived Scarcity on Consumers' Buying Behavior.

Herpen, E. V., Pieters, R., & Zeelenberg, M. (2005). How product scarcity impacts on choice: Snob and bandwagon effects. NA-Advances in Consumer Research Volume 32.

Higgins, E. T. (1997). Beyond pleasure and pain. American psychologist, 52(12), 1280.

Howard, D., Shu, S., & Kerin, R. (2007). Reference price and scarcity appeals and the use of multiple influence strategies in retail newspaper advertising. Social Influence, 2(1), 18-28.

Jung, J. M., & Kellaris, J. J. (2004). Cross-national differences in proneness to scarcity effects: The moderating roles of familiarity, uncertainty avoidance, and need for cognitive closure. Psychology & Marketing, 21(9), 739-753.

Kim, Y. J. (2006) The role of regulatory focus in message framing in antismoking advertisements for adolescents. Journal of Advertising, 35, 143-151.

Knowles, E. S., & Linn, J. A. (Eds.). (2004). Resistance and persuasion. Psychology Press.

Ku, H. H., Kuo, C. C., & Kuo, T. W. (2012). The effect of scarcity on the purchase intentions of prevention and promotion motivated consumers. Psychology & Marketing, 29(8), 541-548.

Lee, S. Y., & Seidle, R. (2012). Narcissists as consumers: The effects of perceived scarcity on processing of product information. Social Behavior and Personality: an international journal, 40(9), 1485-1499.

Lindenberg, S., & Steg, L. (2007). Normative, gain and hedonic goal frames guiding environmental behavior. Journal of Social issues, 63(1), 117-137.

Lynn, M. (1987). The effects of scarcity on perceived value: Investigations of commodity theory

Lynn, M. (1992). The psychology of unavailability: Explaining scarcity and cost effects on value. Basic and Applied Social Psychology, 13(1), 3-7.

Lystig Fritchie, L., & Johnson, K. K. (2003). Personal selling approaches used in television shopping. Journal of Fashion Marketing and Management: An International Journal, 7(3), 249-258.

Mano, H. (1994). Risk-taking, framing effects, and affect. Organizational Behavior and Human Decision Processes, 57(1), 38-58.

Mandler, G. (1975). Mind and emotion. Krieger Publishing Company.

Markus, H. R., & Schwartz, B. (2010). Does choice mean freedom and well-being?. Journal of Consumer Research, 37(2), 344-355.

Micu, C. C., & Chowdhury, T. G. (2010). The effect of message's regulatory focus and product type on persuasion. Journal of Marketing Theory and Practice, 18(2), 181-190.

Mourali, M., Böckenholt, U., & Laroche, M. (2007). Compromise and attraction effects under prevention and promotion motivations. Journal of Consumer Research, 34(2), 234-247.

Nichols, B. S. (2012). The development, validation, and implications of a measure of consumer competitive arousal (CCAr). Journal of Economic Psychology, 33(1), 192-205.

Oruc, R. (2015). The Effects of Product Scarcity on Consumer Behavior: A Meta-Analysis (Doctoral dissertation, Frankfurt (Oder), Europa-Universität Viadrina Frankfurt, Diss., 2015).

Paulhus, D. L., & Lim, D. T. (1994). Arousal and evaluative extremity in social judgments: A dynamic complexity model. European Journal of Social Psychology, 24(1), 89-99.

PWC, (2016). They say they want a revolution Total Retail 2016. PWC. Retrieved from http://They say they want a revolution Total Retail 2016.

Robinson, S. G. (2011). Diminished Product Inventory: The Effects of Visible Quantity on Choice in Retail Settings. Florida State University.

Schindler, Robert M. (1989), "The Excitement of Getting a Bargain: Some Hypotheses Concerning the Origin and Effects of Smart-Shopper Feelings," in *Advances in Consumer Research,* vol. 16, Thomas K. Srull, ed., Provo, UT: Association for Consumer Research, 447–453.

Snyder, C. R. (1992). Product scarcity by need for uniqueness interaction: a consumer catch-22 carousel?. Basic and applied social psychology, 13(1), 9-24.

Suri, R., Kohli, C., & Monroe, K. B. (2007). The effects of perceived scarcity on consumers' processing of price information. Journal of the Academy of Marketing Science, 35(1), 89-100.

Tat, P., Cunningham, W. A., & Babakus, E. (1988). Consumer perceptions of rebates. Journal of Advertising Research, 28(4), 45-50.

Thaler, R. (1985). Mental accounting and consumer choice. Marketing science, 4(3), 199-214.

Van Herpen, E., Pieters, R., & Zeelenberg, M. (2009). When demand accelerates demand: Trailing the bandwagon. Journal of Consumer Psychology, 19(3), 302-312.

Van Herpen, E., Pieters, F. G. M., & Zeelenberg, M. (2007). When less sells more and when it does not: The impact of product scarcity on preference and choice. Lsg Marktkunde en Consumentengedrag.

Wicklund, R. A. (1974). Freedom and reactance. Lawrence Erlbaum.

Worchel, S., & Brehm, J. W. (1971). Direct and implied social restoration of freedom. Journal of Personality and Social Psychology, 18(3), 294.

Worchel, S., Lee, J., & Adewole, A. (1975). Effects of supply and demand on ratings of object value. Journal of Personality and Social Psychology, 32(5), 906.

Wu, C., & Hsing, S. S. (2006). Less is more: How scarcity influences consumers' value perceptions and purchase intents through mediating variables. Journal of American Academy of Business, 9(2), 125-132.

Wu, W. Y., Lu, H. Y., Wu, Y. Y., & Fu, C. S. (2012). The effects of product scarcity and consumers' need for uniqueness on purchase intention. International Journal of Consumer Studies, 36(3), 263-274.

Zhu, M., & Ratner, R. K. (2015). Scarcity polarizes preferences: The impact on choice among multiple items in a product class. Journal of Marketing Research, 52(1), 13-26.