

# Erasmus University Rotterdam

Erasmus School of Economics

Master Thesis MSc Marketing

*Examining the effect of strategic group behavior on market structure: a GenL model analysis.*

Name student: Ted Melzer

Student ID number: 483790

Supervisor: Luis Pilli

Second assessor:

Date final version: 04-08-2023

The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

# Content page

<b>Abstract</b>	<b>P. 4</b>
<b>Introduction</b>	<b>P. 5</b>
- <i>Relevance</i>	<b>P. 6</b>
○ Managerial relevance	<b>P. 6</b>
○ Methodological relevance	<b>P. 7</b>
<b>Literature Review</b>	<b>P. 8</b>
- <i>Strategic groups</i>	<b>P. 8</b>
○ Definition	<b>P. 8</b>
○ The addition of mobility barriers	<b>P. 9</b>
○ Strategic interactions	<b>P. 9</b>
- <i>How strategic groups influence market structure</i>	<b>P. 10</b>
○ Strategic groups and market structure	<b>P. 10</b>
○ Managerial decision-making	<b>P. 10</b>
○ Segmentation, targeting and positioning	<b>P. 11</b>
○ Brand repositioning	<b>P. 12</b>
- <i>The influence of managerial decision making on consumer preferences</i>	<b>P. 13</b>
○ Consumer heterogeneity	<b>P. 13</b>
○ Choice set heterogeneity	<b>P. 13</b>
○ Consideration sets vs choice sets	<b>P. 14</b>
<b>Data &amp; Methodology</b>	<b>P. 15</b>
- <i>Data</i>	<b>P. 15</b>
- <i>Method</i>	<b>P. 18</b>
○ Choice experiments	<b>P. 18</b>
- <i>Model specifications: GenL</i>	<b>P. 19</b>
○ Lower model: Preference Heterogeneity	<b>P. 20</b>
○ Upper model: Choice Set Heterogeneity	<b>P. 21</b>
- Hypotheses	<b>P. 22</b>
<b>Results</b>	<b>P. 23</b>
- <i>Goodness of fit</i>	<b>P. 23</b>
- <i>Hypothesis 1</i>	<b>P. 24</b>
- <i>Hypothesis 2</i>	<b>P. 26</b>
- <i>Research question</i>	<b>P. 27</b>

<b>General Discussion</b>	<b>P. 31</b>
- <i>Conclusion</i>	<b>P. 31</b>
- <i>Implications</i>	<b>P. 32</b>
○ Managerial implications	<b>P. 32</b>
○ Methodical implications	<b>P. 33</b>
- <i>Discussion</i>	<b>P. 33</b>
○ Limitations	<b>P. 33</b>
○ Future research	<b>P. 34</b>
<b>Appendix</b>	<b>P. 36</b>
<b>References</b>	<b>P. 38</b>

## Abstract

*This research focusses on the impact of strategical actions undertaken by strategic groups, such as repositioning, on market structure in the chocolate bar industry. It does so by first unwinding the literature of strategic groups, market structure and choice set formation. Using conjoint analysis data, the methodological framework applies a GenL model incorporating choice set heterogeneity. The GenL model demonstrates that repositioning creates a more distinct industry by reducing overlap between strategic groups in brand attributes and competitive behavior. This effect of the repositioning of one strategic group results in changes in the market structure, since all brands in the industry see their market share change. The repositioned strategic group and the strategic group that is more adjacent to the repositioned strategic group see their market share decrease. While the strategic group, where the repositioned strategic group positioned away from, gains market share.*

# Introduction

The market structure of an industry is determined by the decisions and actions of brands operating within it. An industry consists of multiple brands, who often exhibit similar strategic decision-making and characteristics. Brands who share those similar characteristics can be grouped into strategic groups. The study of strategic groups and their impact on market structure, managerial decision-making, and consumer preferences has garnered significant attention in the field of strategic marketing. Through the inclusion of mobility barriers (Thomas & McGee, 1986), factors that hinder the movements of brands, and strategic interactions (Dranove, Peteraf & Shanley, 1998), cooperative and coordinated behaviors between brands, the existence and impact of strategic groups on industry dynamics have been proved.

Strategic management plays an important role in shaping strategic groups and the market structure. Managers have the ability to influence the market structure through segmentation, targeting, and positioning strategies (El-Ansary, 2006). These strategic decisions determine which market segments to enter, how to position the brand, and how to create a competitive advantage. Managerial decisions impact consumer preferences. Consumer heterogeneity, individual differences between consumers (Allenby & Rossi, 1998), and preference heterogeneity, difference in underlying preferences between consumers (Greene & Hensher, 2013), are key factors influencing brand strategy and the marketing mix. The formation of choice sets, subsets of brands considered by consumers before making a purchase decision (Swait & Feinberg, 2014), is influenced by strategic marketing decisions and brand positioning. Understanding consumer choice sets and consideration sets is crucial for marketers to optimize their marketing efforts and maximize profitability.

The choice set of consumers are getting more and more diversified. Resulting in our current world that consumers are making choices that seem simple but are in fact more complicated than one might think. More information is shown to the consumer at the same time, and it reaches a point where consumers have difficulty to efficiently make decisions, because of too much information, also known as information overload (Edmunds & Morris, 2000). There is

an abundance of useful information, but filtering this useful and relevant information is complex. A more recent definition is provided by Roetzel (2019) who states that when consumers are given many sets of information, information that is complicated, abundant, and contradictory, the quality of the decision suffers because it lacks resources to process all available information to make the best decision. Brands should be aware of consumers not assessing all available options and information. The way consumers evaluate the available options is affected by strategic management who operate in the same industry.

This master thesis will examine the relationship between product positioning and changes in the market structure by analyzing choice set formation. The research question: *“Does product repositioning lead to changes in the market structure by influencing choice set formation?”* will be addressed by reviewing relevant literature and conducting an empirical analysis. To do so, the research focuses on the concepts of strategic groups, market structure, and choice set formation.

## **Relevance**

### *Managerial Relevance*

Fiengenbaum, Thomas & Tang (2001) find that repositioning happens because brands want to create or maintain a competitive advantage. Understanding the impact of repositioning on the market structure of an industry and consumer preferences has significant managerial relevance. Brands need to be able to differentiate their products from those of their competitors and target specific consumer segments to gain a competitive advantage in the market. A brand should understand the importance of the brand's comprehension of its competitive position to other brands as perceived by consumers. Ignoring the position of the brand in the consumers' mind can lead to missed opportunities in profit maximalization. By strategically positioning and repositioning products, manager can influence consumers' consideration sets and choice sets, which ultimately impact their purchase decision. This shows the importance of managers to carefully consider the implications of their strategic decisions on the market structure.

### *Methodological Relevance*

This research also contributes by providing more insights into the effects positioning has on the market structure. Looking further than the more common methodological discreet choice models, such as multinomial logit models, deeper understanding and better estimation of managerial decision making on market structure will be added to the literature. It does so by looking into the less researched field of the effects of choice set heterogeneity, instead of the abundant literature on preference heterogeneity.

The structure of the thesis will be as follows. First an illustration of the most important literature surrounding strategic groups, and its effect on market structure, and consumer preferences will be presented. Afterwards the start to the empirical study by starting to show the data and methodology. Followed by the result of the empirical research. It ends with the general discussion, which shows conclusion, implications, and discussion.

# Literature review

The study of strategic groups and their impact on market structure, managerial decision-making, and consumer preferences has received significant attention in the strategic marketing literature. This literature review aims to define what strategic groups are and how the formation of strategic groups resembles a simplified market structure, influenced by strategic marketing managers. Managers can influence the market structure by the strategic interactions between brands and consumers by segmentation, targeting and positioning the brand in a certain way. This study will focus more in-depth on marketing strategy and strategic groups. Looking at how these managerial decisions shape consumer choice set formation, the set of brands considered before buying.

## **Strategic groups**

Literature about strategic groups all start with defining what a strategic group is. Throughout years of strategic group research, the question whether strategic groups exist has been pressing. This part will define what a strategic group is and show through the incorporation of mobility barriers, elements that hinder the mobility of brands in a competitive structure, and strategic interactions, behaviors between brands, strategic groups do exist.

## *Definition*

In strategic marketing, the field that investigates the grouping of brands within an industry based on similar strategic decision making and characteristics, is called strategic groups. The starting point of strategic groups can be brought back to Chandler's (1962, p. 13) quote about corporate strategy: "Strategy can be defined as the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and the allocation of resources necessary for carrying out these goals.". Hunt (1972) used this work to focus on the strategic differences among competitors' operations in the home appliance market and was the first to mention the term *Strategic Groups*. It is the literature and definition of Porter (1979) that has been widely used as starting point for further research about Strategic Groups. Porter (1979) defines strategic groups as a group of brands making



similar decisions in key strategic areas while being different from brands outside in one or more key strategic dimensions. Evidence for the grouping of brands remains unclear.

### *The addition of mobility barriers*

Thomas & McGee (1986) add to the literature that mobility barriers are a better foundation for the existence of strategic groups than strategy, since strategy is too broad. Mobility barriers are factors or conditions that hinder or impede the mobility of brands between strategic groups in an industry. It results in high investments for the groups which can also be unrecoverable, limits the ability to imitate and works as entry barriers. According to Barney & Hoskisson (1990) mobility barriers did not address the two main problems of strategic group theory: (1) do strategic groups exist and (2) does being part of a strategic group improve the profitability? Olusoga, Mokwa & Noble (1995) try to refute these main problems by looking at the link between mobility barriers and strategic group performance, such as brand profitability and market share. Mobility barriers may consist of brands' unique skills or strategies and leveraging the right strategy or brands' unique skills results in competitive advantages. Mobility barriers could therefore result in competitive advantages, proving that being part of a strategic group improves profitability. Additionally, Reger & Huff (1993) argue that by taking a cognitive approach strategic group research could still be of importance despite the complications portrayed by Barney & Hoskisson (1990). The research is based on cognitive data, which consists of cognitive structures. These cognitive structures are uncovered by gaining insights from individuals' perspectives, such as strategists and managers. This angle allows to mitigate the limitations set by Barney & Hoskisson (1990) by showing that groups within a strategic group can have variance in strategy. And even if there is no correlation between performance and group membership managerial perceptions of differences and similarities do influence strategic decision making.

### *Strategic interactions*

Eventually Dranove, Peteraf & Shanley (1998) find evidence that strategic groups exist by looking at the group-level characteristics instead of firm-level characteristics, because strategic groups will exist if the performance of a brand is a function of the group characteristics. Because group characteristics, or group-level effects, will have significant effect for both intergroup and intragroup rivalry (Mas-Ruiz, Ruiz-Moreno & Ladrón de

Guevara Martinez, 2013). Intergroup rivalry refers to the competitive dynamics and conflicts that arise between different strategic groups in an industry, while intragroup rivalry refers to the competitive interactions among brands within a strategic group. Examples of these group characteristics or group-level effects are market power, efficiency, differentiation, and multimarket contact. Another change in idea was that not mobility barriers but strategic interactions should be the basis of grouping brands. Strategic interaction denotes the array of brand behaviors in which there is some form of cooperation and coordination (Dranove et al., 1998). Song (2009) acknowledges that firms may be grouped based on their strategic interactions with other brand, since strategic interactions result in shared patterns of behavior and decision making.

### **How strategic groups influence market structure**

#### *Strategic groups and market structure*

Desarbo & Grewal (2008) find that there are different kinds of brands within strategic groups: core, secondary, solitary and hybrid brands. It adds to the literature that strategic groups and all its competitive configurations can be seen as a simplified market structure. This is already formulated by Grover & Srinivasan (1987) showing that competitive market structure is the idea of a group of brands in a product class who compete more severe with each other than with brands belonging to other groups. The identification and depiction of strategic groups and their strategic interactions, the array of brands behavior in which there is some form of cooperation and coordination, make it possible to understand how brands' behavior affects the competitive structure of the market (Söllner & Rese, 2001). Looking at strategic groups thus makes it possible to identify the market structure from the brand or supply side. Market structure itself is also comprised of the consumers and their behavior, the demand side (Grover & Srinivasan, 1987). To which this review will get back at later.

#### *Managerial decision-making*

DeSarbo & Grewal (2008) show models of industries consisting of different strategic groups and indicate that the degree to which brands identify to a strategic group is decided by strategic management. Leask & Parker (2007) show that management will choose to be part of a strategic group because there is a relationship between strategic group membership and financial performance. Brands that belong in more diversified and innovative group tend to

have higher financial performance compared to less diversified and innovative strategic groups. Subsequently, Mas-Ruiz & Ruiz-Moreno (2011) find that brand size also influences group behavior, because brand size acts a driver for rivalry within and between strategic groups. Lastly, Sonenshein, Nault & Obodura (2017) show managerial decision-making influences strategic intergroup and intragroup behavior in the strategic group identity, which encompasses shared beliefs, norms and values among members of a strategic group. A shared identity leads to more cooperation within the strategic groups, because it ensures and secures collective benefits for the group members. On the other hand, this leads to heightened competitive behavior between the strategic groups, since it leads to an “us vs. them” mentality. A brand’s strategic decisions, size and identity in the end will be monitored and altered by managers, so one could argue that managerial decisions can influence market structure.

#### *Segmentation, targeting and positioning.*

As described above strategic interactions show how strategic groups form, which are in fact a result of decisions made by managers. In marketing literature, the most well-known framework for (strategic) marketing managers to create, communicate and deliver value to customers is the segmentation, targeting and positioning framework (El-Ansary, 2006), as will be further explained below.

A market segment as described in marketing literature is a group of consumers who are homogenous in terms of the probability of choosing different brands in the product class (Grover & Srinivasan, 1987). Segmentation is the strategy of dividing the market into market segments (Goyat, 2011). In relation to market structure, segmentation looks at customer heterogeneity and segments those with similar characteristics (DeSarbo, Grewal & Scott, 2008). Once market segments are identified, it is the decision of which and how many market segments to enter that is called targeting in marketing literature (Dibb & Simkin, 1991). Targeting emerges from identifying untapped needs in those segments and profitably serve them (Camilleri, 2018). It is the market structure, the degree of market concentration, the competitive intensity and market entry barriers, that determines which market segments should be targeted (Li & Liu, 2013). In the targeted market segments, creating a distinct and desirable image of the brand in the minds of the consumers is known as positioning (Donzal

& Unger, 1987). It is the positioning, and therefore the relative difference within and between strategic groups (Dornier, Selmi & Delécolle, 2012), that mirrors the market structure. A special kind of positioning is repositioning, which will be elaborated upon in the next paragraph.

A brand's competitive positioning will be determined by how a brand portrays its characteristics and communications. It is the combination of the different marketing practices that enables managers to make the brand stand out. This combination of marketing practices is referred to as the marketing mix. The marketing mix should be used as a mean to transform marketing planning into practice (Gooi, 2009). The most well-known marketing mix framework is known as the "4Ps". The 4Ps stand for Price, being the costs that the product has; Product, what it is that a brand sells; Promotion, how can a brand make consumers aware of its product; Place, where does the brand sell the product. By altering every specific component of the 4Ps a brand specific marketing mix will originate. Grönroos (1997) mentions that it is the composition of the marketing mix that can change the competitive position of a brand.

### *Brand repositioning*

Repositioning is a strategical action taken by management in order to change the perception of the brand in the minds of the consumers. Dittrich, Duysters & De Man (2007) define repositioning as a deliberate and proactive process undertaken by brands to transform their competitive positioning in response to changes in the business environment. Bogner, Thomas & McGee (1996) illustrate the role of strategic groups in shaping the competitive market structure when a brand within that market repositions. The segments to target are therefore determined by the competitive positioning and strategies of the existing strategic groups in that industry. The segments targeted by the repositioned brand are segments where the strategic groups are less concentrated (Bogner et al., 1996). Fiengenbaum, Thomas & Tang (2001) mention that brands reposition in order to respond to rapid changes in the market, exploit market opportunities and create and maintain a competitive advantage. They also highlight that this repositioning also happens across strategic groups if that aligns with future market opportunities. Managers use their own strategic group as a reference point, so that, within a strategic group, managers have two ways to reposition. Either less similar to the

current strategic group, and therefore more similar to an adjacent strategic group, or more similar to the existing strategic group. Schimmer and Brauer (2012) find that the brands with lower performance levels are more likely to engage in strategic repositioning efforts. The low performing brands tend to reposition themselves away from their strategic group, while the high performing brands reposition themselves more towards the existing strategic group.

### **The influence of managerial decision making on consumer preferences**

#### *Consumer heterogeneity*

If the goal of brands and managers is to sell products or services, then strategic decisions, such as segmentation, targeting and positioning, are outcomes of brand managers understanding of consumers' preferences (Kamakura, Kim & Lee, 1996). It is consumer heterogeneity, the set of individual differences in brand preference (Allenby & Rossi, 1998), that is the basis for brand strategy, such as the segmentation, targeting and positioning framework, to understand how consumer choice is influenced by the marketing mix set by management (Horseky, Misra & Nelson, 2006). The individual differences in brand preference in response to the marketing mix is called preference heterogeneity (Kamakura et al., 1996). This heterogeneity in the decision-making process stems from the different combinations of demographics, psychographics, socio-economic and cultural factors which each individual is comprised of.

#### *Choice Set Heterogeneity*

Consumers nowadays are presented with a fast number of choices per product category, but in the end will only choose among a small set of products they prefer. There is heterogeneity in the diversification and deepness of the choice set among consumers. This heterogeneity can be translated into choice probability and one of the important theories is Choice Set Formation (from now on CSF). CSF, as formulated by Swait & Feinberg (2014), can be seen as the generation of subsets of brands from a universal set of brands, containing only the brands that have a chance of being chosen in any specific purchase occasion. The inclusion of brands in such a subset can result from strategic marketing decisions (Priester et al., 2004). The positioning, also repositioning, of the firm's products is one of those strategic marketing decisions and Swait & Erdem (2007) show that the positioning of a product matters for being

considered into a consumer's CSF. Pilli, Swait & Mazzon (2022) acknowledge this proposition by showing that ignoring CSF refrains manager to be profit maximizers.

### *Consideration vs choice sets*

To understand CSF, it is important to distinguish choice sets from consideration sets.

Although choice sets and consideration sets in some literature are used interchangeably, in this research there will be a clear distinction. This distinction is described by Shocker et al. (1991) finding that consideration sets are a dynamic set constructed over a longer period of time consisting of all salient and accessible alternatives. Nedungadi (1990) shows that brand recall, the ability of consumers to remember and recognize a brand from their memory, influences the inclusion of that brand in the consumers' consideration set, subsequently affecting their ultimate choice. These findings showed marketers that focusing on brand recall through various marketing activities enhances the likelihood of their brand being included in the consideration set. In turn resulting in an increased chance of being the brand chosen by consumers. Ballentyne, Warren & Nodds (2006) add to the literature that besides memory-based choice, such as brand recall, also stimulus-based choice, such as brand recognition, influences the inclusion in consideration set and therefore the choice. It is safe to assume that in a stable industry, it is the brand that is the driver of consumer choice.

Choice sets are denoted as the set of alternatives considered directly before the choice decision. A choice set is thus more instantaneous of nature than a consideration set (Swait & Erdem, 2007). Because of the number of brands per category consumers may not be aware of all options. Draganska & Klapper (2011) argue that in the choice set not all brands are considered since consumers are not aware of all options at time of purchase. One could therefore argue that at the purchase decision it is the relative position of the brands in the choice set that ultimately influences the choice.

The next section will look how the research question *“Does product repositioning lead to changes in the market structure by influencing choice set formation?”* will be answered. By looking at the empirical section, consisting of the data and method used. Resulting in hypotheses based on the literature review and method.

# Data & Methodology

## Data

A dataset provided by my supervisor is used to answer the research question and its hypotheses formalized earlier in this study. The data consisted of answers given by individuals who took part in a choice experiment, i.e. conjoint analysis. Next to the answers of the choice experiment the data also consisted of demographic variables from the respondents. The dataset contains 598 respondents randomly dispersed across the Netherlands and Belgium. The data was obtained through Prolific, which is an online consumer panel. The respondents were asked to choose their preferred option out of a choice task of six options, Figure 2 is an example of a choice task and can be found in the appendix. In total the respondents had to answer 12 choice tasks. The choice task consisted of six chocolate bar brands with four product attributes, as described in Table 1.

**Table 1**

*Brand and attributes and the respective levels of the chocolate bars in the choice experiment*

Brand	Type of chocolate	Flavor	Quality Rating	Price
Chateau	Milk	Pure	0 star	€0.55; €0.70;
Côte d'Or	70% Cacao	Almonds	1 star	€0.85; €0.95;
Nestle		Salted caramel	2 stars	€1.20; €1.35;
Tony's Chocolonely			3 stars	€1.45; €1.75;
Lindt			4 stars	€2.05; €2.20;
Godiva			5 stars	€2.65

The attributes were divided into two groups. First, type of the chocolate and the flavor are generic attributes. Meaning that the attributes do not have different levels for different brands. Second, the quality rating and price are tier specific attributes. The quality and price therefore depend on the tier each brand is in. The six brands were divided into three different strategic groups. Chateau and Côte d'Or belonged to the low-quality group, 0-, 1- or 2-stars quality, with a low price; Nestle and Tony's Chocolonely belonged to the middle-

quality group, 2-, 3- or 4-stars quality, with a medium or high price; Lindt and Godiva belonged to the high-quality group, 3-, 4- or 5-stars quality, with a high price. The division of the brands into their respective strategic group can be seen as the simplified competitive structure of the chocolate bar industry.

The respondents were randomly divided between two different experimental conditions. It was a between-subjects design, so a respondent was randomized into one of the two conditions and he or she answered the 12 choice tasks in the same condition. Around half of the respondents answered 12 choice tasks which follows the competitive structure as described above. The other half of the respondents were assigned into the second experimental condition. The second experimental condition consisted of six choice sets following the original competitive structure. For the last six choice sets an exogenous shock was introduced for the middle quality brands, such as repositioning done by marketing management. The middle quality brands were then as follows: Nestle and Tony's Chocolonely belonged to the middle quality brand, 1, 2 or 3 stars, with a medium price. Respondents were not made aware to what experimental condition they were assigned, nor were they informed about the exogenous shock. Table 2 illustrates the experiment and its exogenous shock and therefore the representation of repositioning. The exogenous shock indicated the middle tier brands repositioning, like described in the section Literature Review. The middle tier brands moved to a new position in the competitive market structure by moving away from their current competitive position.



**Table 2***Illustration of the choice experiment*

Brand	Experimental condition 1		Experimental condition 2	
	Price	Quality	Price	Quality
Côte d'Or	€0.55; €0.70;	0, 1 or 2 stars	€0.55; €0.70;	0, 1 or 2 stars
Chateau	€0.85		€0.85	
Nestle	€1.35; €1.75;	2, 3 or 4 stars	€0.95; €1.20;	1, 2 or 3 stars
Tony's Chocolonely	€2.05		€1.45	
Lindt	€1.75; €2.20;	3, 4 or 5 Stars	€1.75; €2.20;	3, 4 or 5 Stars
Godiva	€2.65		€2.65	

Lastly the data also showed some demographic variables of the respondents. These demographic variables included whether the respondents lived in the Netherlands or Belgium. The age of the respondent, his or her ethnicity, the employment status, and finally whether the respondent was a student or not. The descriptive of the demographic variables can be found in Table 3.

**Table 3***Frequencies of demographic descriptive from the dataset*

Market	Gender	Student	Ethnicity	Employment
Belgium = 105	Female = 298	No student = 270	White = 481	Full time = 199
			Asian = 36	Parttime = 140
Dutch = 491	Male = 297	Student = 247	Black = 18	Unemployed = 65
No information = 2	No information = 3	No information = 81	Mixed = 39	Other = 88
			Other = 20	No information = 106
			No information = 4	

## **Method**

### *Choice experiment*

To estimate the effect of repositioning on the probability of being chosen by consumers this research used a choice experiment. Choice experiments are a valuable research methodology for analyzing individuals' preferences and decision-making processes in various domains such as marketing (Cleland, Porteous & Skåtun, 2018). Choice experiments are designed to capture individuals' preferences by presenting them with a set of alternatives and asking them to choose their preferred option. Choice experiments recognize that decision-making involves trade-offs and allows to estimate the relative importance of different attributes or features influencing individuals' choices (SurveyMonkey, 2021).

Components of a choice experiment:

1. **Attributes:** the relevant attributes or features of the product, which can be found in Table 1.
2. **Levels:** the levels or values for each attribute, which can be found in Table 1.
3. **Experimental Design:** the two experimental conditions, as shown in Table 2, show the combination of attributes and their respective levels as presented to respondents.
4. **Choice Task:** in the choice task the respondents could only choose one preferred option, making the alternatives mutually exclusive. The respondent was asked to choose the preferred option, making the choice task exhaustive. Lastly, the respondent was only shown 6 alternatives per choice task, making the choice finite. The choice sets followed a D-efficient experimental design generated using N-Gen software.

Within the realm of choice experiments, conjoint analysis stands out as a widely adopted technique (Cleland et al., 2018). Conjoint analysis is a statistical technique used within the framework of choice experiments to assess individuals' preferences for various attributes or features of a product. It decomposes a decision problem into its essential parts, enabling to measure the relative importance of different attributes and estimate individuals' utility functions (Qualtrics, 2022). A conjoint analysis consists of the following steps:

1. **Data Collection:** the data was collected by administering an online survey. The collection of the data is described in the 'Data' part.

2. Data Analysis: using econometric models such as generalized extreme value (GEV) models individuals' utility functions and attribute preferences based on the observed choices was calculated. The specifications of the models can be found below section 'model specification: GenL'.
3. Model Estimation and Interpretation: in the result section the model parameters will be assessed. The focus will be on the probability that a brand will be chosen, the attribute levels as presented in Table 1 and the effect of nationality. Showing the relative importance of each attribute.

### Model specifications: GenL

The GenL (Choice Set Generation Logit) model is a so-called network representation (Swait, 2001), which is presented in Figure 1. This means that from every alternative to the root there are multiple paths, and each path corresponds to a possible latent choice set. Each path therefore denotes a choice probability conditional on the choice set, and the unconditional probability of choice will be the sum of these conditional probabilities weighted by the likelihood of the path.

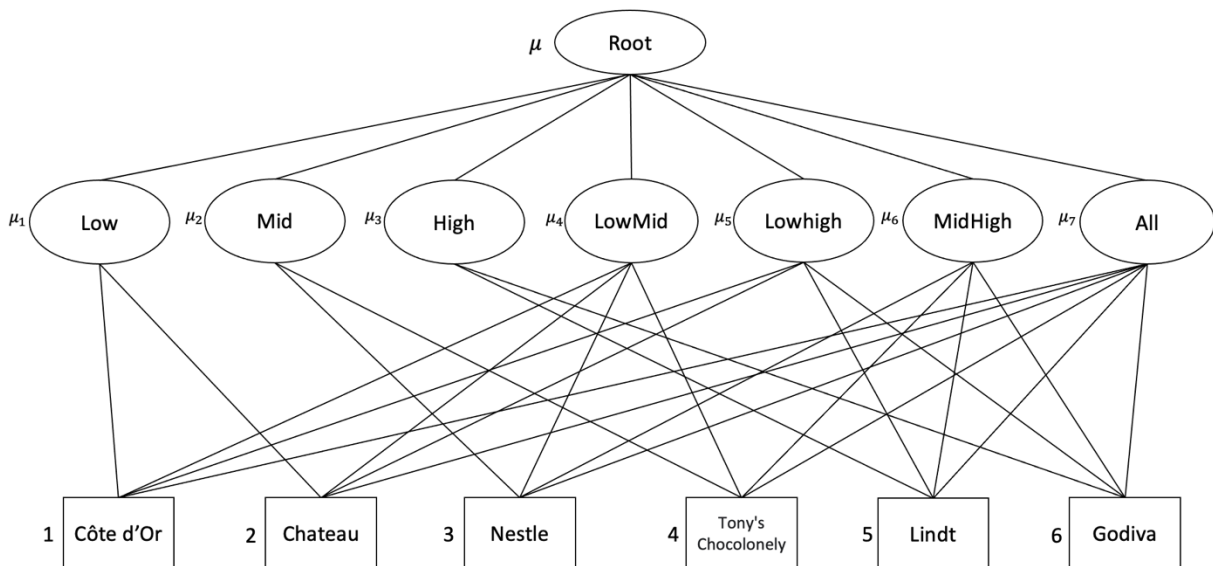


Figure 1. GenL graphical representation for  $M = \{1, \dots, 7\}$

Based on Figure 1 the joint probability of an individual  $i$  and choice set  $C_k$  is given by the sum of the products of transition probabilities. This implicates that the probability that an individual  $i$  chooses choice set  $C_k$  is denoted by Function 1.

**Function 1:**

$$P(i) = \sum_{k \in K_i} P(i, C_k) = \sum_{k \in K_i} P(i | C_k) Q(C_k)$$

This research used a GEV model to observe the probabilities that a brand will be chosen and the influence of the attributes and demographics on this decision. Train (2002, P. 87) mentioned what all GEV models have in common: *“the unifying attribute of these models is that the unobserved portions of utility for all alternatives are jointly distributed as a generalized extreme value. This distribution allows for correlations over alternatives and, as its name implies, is a generalization of the univariate extreme value distribution that is used for standard logit models.”* The model consisted of two sub-models. In the upper model addressed choice set heterogeneity and in the lower model incorporated preference heterogeneity. Combining both sub-models resulted in the probability that individual  $i$  chooses choice set  $C_k$ , as denoted by Function 1.

*Lower model: Preference Heterogeneity*

The lower model incorporated Preference Heterogeneity, the differences in consumers' underlying preference for various attributes or features of alternatives within a choice set (Greene & Hensher, 2013). Accounting for preference heterogeneity uncovers additional dimensions of variation in individuals' choices. This understanding can influence targeted marketing strategies, product development, and policy interventions.

The GenL model used in this empirical is an implementation of a GEV model described by Swait (2001). The First part of Function 1 represents the lower model, see Function 2, presenting the choice probabilities of the specific brands. Function 2 shows the utility  $V_i$ , the utility consumer  $i$  gets from choosing choice set  $C_k$ , and stems from the utility function  $U_{nj} = V_{nj} + \varepsilon_{nj}$ , showing the utility of person  $n$ , where  $V_{nj}$  is observed and  $\varepsilon_{nj}$  is an unobserved random variable. Next,  $\mu_k$  expresses the proportion of variance of the random term in the utility function, for a deeper understanding see Train (2001).

**Function 2:**

$$P(i|C_k) = \frac{\exp(\mu_k V_i)}{\sum_{j \in C_k} \exp(\mu_k V_j)}$$

### *Upper model: Choice Set Heterogeneity*

It is important to understand that there is difference within choice sets and between choice set, choice set heterogeneity (from now on CSH) depicts the heterogeneity within a choice set. As described in the literature review CSF is the generation of subsets, only including the products that have a chance of being chosen at the purchase occasion. Draganska & Klapper (2011) mention there is considerable heterogeneity between choice sets, because consumers have different sizes and compositions of these choice sets. That is why the upper model accounted for CSH, the heterogeneity in the size and composition of choice sets between consumers.

The upper model multiplied the brand specific brand choice probabilities. It took the logsum of the alternatives belonging to it, so that in the upper model each multiplication is a multinomial logit (MNL) over the logsum. This was particularly useful since it allows to understand the choice probabilities for nests, from now on tiers. The logsum expresses the overall utility, also known as the 'welfare function', which is the log of the sum of the exponentiated utilities, hence the name logsum. The logsum allowed for the grouping of the brands based on their shared characteristics and place them in tiers. In the specific implementation of the GenL model used in this research the experimental condition is added to the logsum, see Function 3. The inclusion of the experimental design in the upper model allowed for the identification of the effects of repositioning on CSH. The decision of the middle tier brands to move away from the high tier brands towards the low tier brands will influence the ratio of the probabilities between the tiers. Therefore, showing the effects of repositioning.

#### **Function 3:**

$$Q(C_k) = P(C_k) = \frac{\mu_k(\text{Logsum}_i) + \gamma_k(\text{Experimental Condition})}{\sum_k \lambda_k(\text{Logsum}_j) + \gamma_k(\text{Experimental condition})}$$

$$\text{Where Logsum} = \text{Inclusive value} = I_K = \frac{1}{\mu_k} \ln\left(\sum_{j \in C_k} \exp(\mu_k V_j)\right)$$

The combination of the upper and lower model, including the experimental condition, allowed for the identification of choice set heterogeneity and preference heterogeneity. The

code to run the GenL model was provided by my supervisor and the results of the model will be discussed in the next section.

## **Hypotheses**

Based on the findings of the literature in the Literature Review section and the model used in this research the following hypotheses have been formulated.

Based on the literature about repositioning brands' decision to reposition is a deliberate and proactive process to transform their competitive positioning (Dittrich et al., 2007).

Unsuccessful brands reposition away from their current strategic group towards a new segment that is less competitive concentrated (Schimmer & Brauer, 2012; Bogner et al., 1996). Therefore, the first hypothesis reads:

H1: The middle tier strategic group will have a higher probability to be chosen after the repositioning than before the repositioning.

There is heterogeneity in decision-making, because every consumer has their own combination of demographic, psychographic, social-economical, and cultural factors. Tiu Wright, Nancarrow & Kwok (2001) explain that difference in food taste is reflected by consumers' social and cultural origin. In the Netherlands consumers prefer more natural flavored products, meaning no flavor enhancer added (Hemmerling, Asioli & Spiller, 2016). Also, Dutch consumers prefer less sweetness, and therefore darker chocolate, because they are increasingly aware of the negative image of sugar in products (Hemmerling et al., 2016; De Boer, 2019). The second hypothesis reads:

H2: Dutch chocolate consumers prefer pure and natural flavored chocolate more than Belgium consumers do.

## Results

This section will reveal the outcomes of the GenL model and answer the two hypotheses drawn up in the literature review. First the goodness of fit will be discussed, followed by the answers of hypothesis 1 and hypothesis 2. Lastly an answer to the research question *“Does product repositioning lead to changes in the market structure by influencing choice set formation?”* will be formulated by including the answers to the hypotheses.

### Goodness of fit

As described in the method section the GenL model consists of a lower model, accounting for preference heterogeneity, and an upper model, where CSH gets included. Without the inclusion of the upper model the model simply consists of an MNL. This MNL can be seen as a baseline model, where the parameters in the utility function of the MNL capture the effects of the experimental manipulation on the brands coefficients. So that the preference heterogeneity can be researched. Since preference heterogeneity has been abundantly researched, it is the addition of CSH into the model that this research is particularly interested in. The GenL model captures the experimental manipulation as a source of CSH by adding the upper model. Comparing the goodness of fit therefore determines whether the GenL model explains more of the variance than the MNL model would do. Table 3 shows the goodness of fit for both models. Table 3 shows the estimation of the AIC, AIC3 and BIC criteria, which are estimators of prediction error and show the relative quality of a statistical model. The lower the estimation of the three criterion the better the statistical fit. Looking at the estimations of the AIC, AIC3 and BIC it shows that the GenL model has a lower estimation for all three criteria, compared to MNL. Therefore, the goodness of fit is better for the GenL model. Hence, accounting for CSH is important and the answers to the hypotheses and research question will be based on the GenL model. The model parameters of the MNL model can be found in the appendix under Table 7.

**Table 3***Goodness of fit for the MNL and GenL model*

Criteria	MNL	GenL
AIC	23164.063	23109.415
AIC3	2318.063	23137.415
BIC	23247.541	23232.435

**Hypothesis 1**

The first hypothesis reads *“The middle tier strategic group will have a higher probability to be chosen after the repositioning than before the repositioning.”*. With the use of the GenL model the tier specific probabilities have been modeled. Finding that the repositioning of the middle tier brands results for the middle tier in having a higher probability to be chosen after the repositioning.

Table 4 shows the model parameters for the GenL model. The first hypothesis investigates the effect repositioning of the middle tier brand has. It is important to verify whether the experimental condition, the repositioning implied by marketing management, has a significant effect. The tier specific parameters Low ( $\mu$ ), Mid ( $\mu$ ) and High ( $\mu$ ) are all significant parameters since their p-value is lower than the significance level of 10%. The mixed tier parameters LowMid ( $\mu$ ), MidHigh ( $\mu$ ) are insignificant, because their p-value is higher than the significance level of 10%, while the LowHigh ( $\mu$ ) is significant, p-value lower than the significance level of 5%. These parameters represent the  $\mu$  in the utility function from the MNL, see Function 2 in the Data and Methodology section. The higher the  $\mu$  the lower the variance in the random component of the utility function. It also implies that when the  $\mu$  is 1 it is not of real effect on the choice set generation process. Looking at the parameters' coefficients and standard errors of these parameters, all parameters are close to one. Meaning that in this dataset the  $\mu$ -parameters are not of importance to describe the choice set generation process, because de endogenous effect, the logsum, does not drive CSH. Instead, the interaction effect between the tiers and experimental condition are providing the evidence for choice set generation process. Proving that the effect of



repositioning are the specific parameters involved in the experimental condition driving the choice set generation process.

**Table 4**  
*GenL model parameters*

<b>Variables</b>	<b>Coefficients</b>	<b>Std Err</b>	<b>t-stat</b>
Chateau	-0.453***	0.105	-4.329
Nestle	-0.057**	0.257	-2.204
Tony's chocolonely	0.118	0.215	0.547
Godiva	0.249	0.223	1.115
Lindt	0.412*	0.226	1.823
70% Cocoa	-0.163***	0.035	-4.673
70% Cocoa X Country	-0.023	0.014	-1.685
Almonds	-0.028	0.023	-1.236
Almonds X Country	-0.114***	0.031	-3.653
Caramel Sea Salt	0.053**	0.023	2.328
Caramel Sea Salt X Country	0.014	0.021	0.671
QualityLow	0.344***	0.076	4.540
QualityMid	0.537***	0.113	4.758
QualityHigh	0.455***	0.097	4.706
PriceLow	-0.989***	0.340	-2.911
PriceMid	-0.957***	0.214	-4.463
PriceHigh	-1.101***	0.230	-4.778
Low (mu)	3.809*	2.101	1.813
Mid (mu)	1.716**	0.649	2.646
High (mu)	1.344***	0.315	4.269
LowMid (mu)	1.357	1.118	1.214
MidHigh (mu)	1.127	0.723	1.560
LowHigh (mu)	1.019**	0.391	2.609
Low_tier Exp_Cond	0.728*	0.416	1.749
Mid_tier Exp_Cond	0.433	0.561	0.771
High_tier Exp_Cond	1.645***	0.311	5.294
Mid_tier (logsum) X Exp_Cond	0.030	0.363	0.083
High_tier (logsum) X Exp_Cond	-0.541***	0.196	-2.756

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

By incorporating the interaction effects from the tiers and experimental condition, as shown in Table 4, the tier specific probabilities can be calculated. Table 5 shows the tier specific probabilities for the control group and the experimental group. Where the control group

shows an industry without repositioning and the experimental group an industry with repositioning. There is a clear trend to see in the probabilities. The probabilities of the pure choice sets, the non-mixed tiers, all have a higher probability to be chosen in the experimental group than in the control group. The middle tier has an increase in the possibility to be chosen of almost 2%. The high tier gains the most, having an increase in probability to be chosen with 13%. While all mixed-choice sets, the mixed tiers, have a lower probability to be chosen in the experimental group than in the control group. The repositioning of the middle tier brand away from the high tier brands towards the low tier brands has resulted in an industry with less overlap between the different tiers. The different tiers in the industry have become more distinct to the consumers. Resulting in an increase the tier specific probability of the middle tier. Consequently, the first hypothesis has been validated.

**Table 5**

*Tier specific probabilities*

<b>Tiers</b>	<b>Total</b>	<b>Control</b>	<b>Experimental</b>
Low tier	0.0567	0.04280	0.0705
Middle tier	0.0905	0.0808	0.1002
High tier	0.1319	0.0668	0.1972
Low + mid tier	0.1414	0.1576	0.1251
Mid + high tier	0.1810	0.2028	0.1591
Low + high tier	0.2055	0.2297	0.1812
All brands	0.2212	0.2473	0.1952

## **Hypothesis 2**

The second hypothesis holds *“Dutch chocolate consumers prefer pure and natural flavored chocolate more than Belgium consumers do.”*. Based on the model parameters that have been calculated by the GenL model partial evidence has been found that Dutch consumers prefer more natural flavored chocolate more than Belgium consumers do.

Table 4 shows the coefficients for all parameters that have been included into the model. Looking at the generic brand attributes, starting with type of chocolate, it shows that 70% Cocoa has a negative coefficient, -0.163. This effect is significant since the p-value is lower than the significance level of 1%. Next generic attribute is flavor. Almonds has a negative coefficient, 0.028, but is also insignificant. The p-value being higher than the significance level of 10%. The other flavor variable, Caramel Sea Salt, has a positive coefficient, 0.053. This effect is significant because the p-value is lower than the significance level of 5%.

From the generic brand attributes 70% Cocoa and Caramel Sea Salt are significant and Almonds is insignificant. Based on literature tastes of consumers is dependent on the consumers' social and cultural origin. Therefore, it is found in the literature that Dutch consumers prefer pure, darker chocolate, and more natural flavored chocolate. Natural flavored chocolate is without any additional flavor enhancers. It is therefore hypothesized that Dutch consumers would have a positive coefficient for 70% Cocoa and negative coefficients for Almonds and Caramel Sea Salt. The coefficient showing the interaction effect between type of chocolate and nationality is given by "70% Cocoa X Country" and is a negative coefficient, -0.023. However, it is insignificant, because the p-value is higher than the significance level of 10%, and therefore not significantly different from 0. "Almonds X Country" shows the interaction effect between Almond infused chocolate and nationality and is a negative effect, -0.114296462. This effect is significant since the p-value is lower than the significance level of 1%. Showing that Dutch consumers indeed prefer chocolate without almonds more than almond infused chocolate. The interaction effect between nationality and caramel sea salt, given by the parameter "Caramel Sea Salt X Country", is positive, 0.014. However, the coefficient is insignificant, the p-value is higher than the significance level of 10%, and therefore not significantly different from 0. Based on the interaction effects there is no evidence that Dutch consumers prefer pure chocolate more and caramel sea salted flavored less. But chocolate infused with almonds are preferred less, implying that natural flavored chocolate is preferred more. Therefore, is the second hypothesis partly accepted.

### **Research question**

Based on findings from the two hypothesis the data shows that when a tier repositions in the market, all probabilities for the pure tiers increase. At the same time, looking at the

characteristics of the consumers of the six brands, partial evidence has been found that nationality is a driver of the generic brand attribute, flavor. Incorporating both results make it possible to determine the industry’s competitive configuration, presented in brand specific probabilities. These probabilities show the chance that a brand is chosen by a consumer in the decision-making process. The display of the brand specific probabilities is shown in Table 6 and shows the simplified market structure for the chocolate bar industry. Just like in Table 4 the control group demonstrates an industry without repositioning, while the experimental group demonstrates an industry with repositioning.

**Table 6**

*Brand specific probabilities for the MNL and GenL model*

Brands	MNL			GenL		
	Total	Control	Experimental	Total	Control	Experimental
Côte D'or	0.1574	0.1499	0.1650	0.1560	0.1605	0.1514
Chateau	0.0898	0.0857	0.0939	0.0911	0.0961	0.0859
Nestle	0.1322	0.1444	0.1201	0.1322	0.1440	0.1204
Tony's						
Chocolonely	0.2693	0.2882	0.2505	0.2694	0.2854	0.2534
Godiva	0.1611	0.1539	0.1680	0.1605	0.1452	0.1754
Lindt	0.1928	0.1827	0.2027	0.1935	0.1732	0.2133

Before diving into the outcomes, it is important to notice a difference between the MNL model and GenL model. The independence from irrelevant alternatives (IIA) is imposed in the MNL model, while it IIA is relaxed in the GenL model. In short IIA implies that for any two alternatives the ratio of the logit probabilities does not depend on alternatives other than two, it is therefore “independent” from other alternatives (Train, 2002). In other words, a choice between two alternatives is solely dependent on the intrinsic merits of these two alternatives and are unaffected by the presence or absence of irrelevant alternatives.

Table 6 illustrates the brand specific probabilities for the MNL model. The probabilities from the experimental group show the market structure after the repositioning {17%; 9%; 12%;

25%; 17%; 20%} following the order Côte d'Or, Chateau, Nestle, Tony's Chocolonely, Godiva and Lindt. Comparing the market structure from the experimental group with the control group presents an interesting effect. The brands in the low tier, Côte d'Or and Chateau, and the high tier, Godiva and Lindt, show a higher probability to be chosen, compared with the control group. Consequently, the middle tier who repositioned, Nestle and Tony's Chocolonely, show a lower probability to be chosen, compared to the control group. This effect can be explained by the IIA assumption, which holds in the MNL model. The middle tier brands are irrelevant alternatives for the low and high tier brands, so their choice probabilities are independent of the actions of the middle tier group. The repositioning therefore only affects the brands within the repositioned tier. Because of the repositioning Nestle and Tony's Chocolonely lose market share while the other brands gain market share.

Table 6 also illustrates the brand specific probabilities for the GenL model. The market structure after the repositioning of the middle tier brands is {15%; 9%; 12%; 25%; 18%; 21%} following the same order as described before. Again, there are some interesting insights when the probabilities of the experimental group are compared to those of the control group. The probabilities for the low tier, Côte d'Or and Chateau, and the middle tier, Nestle and Tony's Chocolonely, all have decreased probabilities to be chosen compared to the control group. While the high tier, Godiva and Lindt, has a higher probability to be chosen, compared to the control group. Again, the IIA plays an important role here, but now because the IIA assumption is relaxed in the GenL. Since all alternatives are in some way correlated to each other, the repositioning of one tier affects the choice probabilities of all tiers and their respective brands. Because of the middle tier brands repositioning the lower tier brands and the middle tier brands lose market share, while the high tier brands gain market share.

Based on the insights provided by the hypotheses and the brand specific probabilities an answer to the research question *"Does product repositioning lead to changes in the market structure by influencing choice set formation?"* can be formulated. Repositioning changes the market structure, since all brands see their probabilities to be chosen affected by the repositioning of a strategic group. The data show that the strategic group that repositions and the strategic group where that specific strategic group repositions towards will lose market share. At the same time, the strategic group that sees the specific strategic group

reposition away from their strategic group gains market share. These effects come to play because repositioning leads to a market becoming more distinct to the consumers, because the overlap between brands, their characteristics and competitive behavior decreases. By accounting for CSH a more precise influence of the brand attributes to the size and composition of the choice sets, and therefore the choice set formation, can be explained.

# General Discussion

## Conclusion

This research answers the research question *“Does product repositioning lead to changes in the market structure by influencing choice set formation?”*. It does so by including choice set heterogeneity in a GEV model, resulting in the GenL model. This model allows to answer the hypotheses, as formulated in the literature review, whose answer support in solving the research question.

The first hypothesis states *“The middle tier strategic group will have a higher probability to be chosen after the repositioning than before the repositioning.”*. By using the GenL model parameters the tier specific probabilities have been estimated. The probability that a specific tier will be chosen shows that after the repositioning all pure choice sets, the non-mixed tiers, have a higher probability to be chosen than without the repositioning. While the mixed choice sets, the mix-tiers, all saw a decrease in the probability to be chosen. Repositioning leads to a more distinct industry for consumers because the overlap between the tiers in terms branding, attributes and competitive behavior decreases. This is in line with the findings in the literature, who identify that it is the unsuccessful brands that reposition in order to become more successful. And that the direction the brands reposition towards a less competitive market segment is, hence creating less overlap in the industry.

The second hypothesis reads *“Dutch chocolate consumers prefer pure and natural flavored chocolate more than Belgium consumers do.”*. With the interaction effect between the generic brand attributes, type and flavor, and nationality partial evidence has been found to support the hypothesis. For the type of chocolate, no effect with nationality has been found. For the flavor a significant negative effect has been found between nationality and almond infused chocolate, while no significant effect has been found between nationality and caramel sea salt flavored chocolate. With literature mentioning that consumer heterogeneity stems from the consumers' social and cultural origin. These findings are in line with Dutch consumers favoring natural flavored chocolate bars.

Combining the answers from the two hypotheses and brand specific probabilities the market structure after the repositioning looks as follows: {17%; 9%; 12%; 25%; 17%; 20%}, following the order Côte d'Or, Chateau, Nestle, Tony's Chocolonely, Godiva and Lindt. Comparing the new market structure to the market structure without repositioning the low tier brands, Côte d'Or and Chateau, and the middle tier brands, Nestle and Tony's Chocolonely, see their probability to be chosen decrease. Consequently, the high tier brands, Godiva and Lindt, see their probability to be chosen increase. So repositioning leads to changes in the market structure because the repositioning leads to a more distinct industry. Because of the repositioning the consumers experience a clearer industry. This results for Nestle and Tony's Chocolonely in a decrease in the probability to be chosen, because they reposition away from the high tier brands towards to low tier brands. As a result of moving closer to the low tier brands, Côte d'Or and Chateau also see a decrease in their probability to get chosen. The winners are Godiva and Lindt, because Nestle and Tony's Chocolonely move away from their position, who see their probability to get chosen increase.

## **Implications**

### *Managerial implication*

Managers, working in the marketing field or affiliated in some way with brands strategy, can use the findings in this research to determine if a change in the positioning of their brand can be useful. Next, it could also provide inside for managers who see one of the competitors going through a repositioning. Manager should be aware of the independence of irrelevant alternatives (IIA) proposition. In the GenL model this proposition is relaxed. In short it means that all actions made by competitors in the industry will have either a positive or negative influence on your brand. If this the IIA is not relaxed, shown by the control probabilities in Table 6, an action by an irrelevant alternative will not have any consequences for your brand. The IIA could be the reason that in the MNL the low tier brand does not experience negative effects from the middle tier brands moving towards their competitive space, while in the GenL model the low tier brands do experience negative effects. In industries with strategic groups action undertaken by marketing managers influence how their brand is perceived by consumers, but it also influences how the other brands in the industry are perceived by consumers. Managers should therefore always inform themselves about all alternatives in



their competitive industry spacing, and specify which alternatives are indeed going to be a relevant alternative.

### *Methodological implication*

This research builds further upon the abundant literature involving preference heterogeneity. By stressing the importance of including choice set heterogeneity into the equation, extra literature into the field of market structure has formulated. By proving that choice set heterogeneity improves the statistical fit of this research methodology new insights into the effect of choice set heterogeneity, focusing on its implications of repositioning in the chocolate bar industry, have been established. Next, this research also shows that, within choice modeling, that using a GEV model improves the statistical fit. The GenL model, compared to the MNL model, has a higher statistical fit and shows extra light on how to predict and account for effects of strategical decisions.

## **Discussion**

### *Limitations*

Originally it was the idea to compute the probabilities of the discrete choice model using the Apollo package in R. R and RStudio (R), a programming language and software package for statistical computing and graphics. It provides a wide range of statistical techniques making it popular by researchers. Advantages of using R are that the software is open source making it available for everybody. Next, it's a software specifically designed for statistical computing and data analysis. It results in many different packages to tailor the right ways to perform complex analyses. Lastly, R has a high reproducibility. By writing scripts of code the analysis is easy documented making it easier to reproduce results. The Apollo package was intended to be used, because it is the most flexible and powerful R package for estimating discrete choice models. The advantages of using Apollo as described by Hess & Palma (2019) are the fact that it's a free accessible package, its ease of use also if the user is new to choice modeling jargon and complexity and the package being customizable. The original idea was to mix a latent class model with a crossed nested logit. Due to the complexity of merging both models another approach was chosen, as described in the method section. A result of having changed the model is that it has relatively low statistical fit.

Another limitation of the model that was used in this research is that many parameters in the choice set generation function were constrained to zero for identification. These parameters were used to test whether the research question and hypotheses were true. These constrained parameters reduce the flexibility of the model to capture the complexity of individual decision-making processes. It implies that certain factors or attributes are completely ignored in the choice set generation, potentially leading to biased or incomplete predictions. It can result in oversimplified or unrealistic representations of the decision process, leading to inaccurate predictions or limited understanding of consumer behavior. Diminishing its explanatory power and potentially hindering the accuracy and validity of choice set probabilities.

A last limitation is that this choice experiment was designed and executed by researchers who themselves are not experts in the chocolate bar industry. This could be problematic since the grouping of the brands could have been wrong, putting the wrong type of brands in the wrong strategic group. Also, parameters could be included into the model that might have been irrelevant. Lastly, important parameters or attributes could have been unintentionally excluded, while in fact could have altered the outcomes of the model parameters, choice set probabilities and brand probabilities.

#### *Future research*

There are several ways how future research could build upon the findings of this research. Chocolate bars belong to the fast mover consumer goods (FMCG) and are a business to consumer (B2C) products. Further research could focus if the same findings can be found in other FMCG markets and if business to business (B2B) products follow the same outcomes. Looking at research in the chocolate bar industry itself also additional research could be done. On the one hand it can be interesting if the findings about the Netherlands and Belgium hold between other parts of the European Union. It can also be of interest to see how taste differ across continents. On the other hand, the same research can be repeated by researchers with more affinity and knowledge about chocolate, and the chocolate bar industry itself, to make sure the right brand, grouping, attributes, and experimental conditions are put in place.

Another angle for future research to investigate is using other methods to calculate the model parameters, choice set probabilities and brand probabilities. New research could look into different models such as latent class, mixed logit or (cross) nested logit. As described in the limitations, the original idea was to combine the strength of two models. But with time and capacity constraints of the software, another approach was chosen. Researcher with the time and capacity could also investigate merging different models to answer the same research question.

Lastly, future research could look into strategic groups itself. As Desarbo & Grewal (2008) mention there are different types of strategic groups. Future research can focus more specifically which specific effects occur when specific types of strategic groups reposition. Next, this research focusses on the effects of repositioning between strategic groups. Zooming in more into strategic groups and investigating the effects of changes in positioning within a strategic group could be of added value in explaining the complete industry.

# Appendix

**Table 7**

*Parameters of the MNL model*

<b>Variables</b>	<b>Values</b>	<b>Standard error</b>	<b>t-stat</b>
ASC_low	-0,311	0,211	-1,473
coteXchateau	0,654***	0,040	16,443
ASC_mid	-0,121	0,168	-0,722
ASC_mid X Exp	-0,305***	0,054	-5,654
nestleXtonny	-0,809***	0,035	-23,040
ASC_high	0,433**	0,171	2,535
godivaXlindt	-0,174***	0,035	-4,989
70% Cocoa	-0,194***	0,015	-12,861
70% Cocoa X Country	-0,016	0,015	-1,0782
Almonds	-0,035	0,021	-1,655
Almonds X Country	-0,131***	0,020	-6,669
Caramel Sea Salt	0,058***	0,020	2,909
Caramel Sea Salt X Country	0,012	0,014	0,832
QualityLow	0,435***	0,028	15,475
QualityMid	0,604***	0,026	23,378
QualityHigh	0,476***	0,026	18,322
PriceLow	-1,414**	0,316	-4,475
PriceMid	-1,152***	0,087	-13,252
PriceHigh	-1,145***	0,052	-22,025

\*p<0.1, \*\*p<0.05, \*\*\*p<0.01

Which of this chocolate bars would buy for your own consumption?













	Chocolate 1	Chocolate 2	Chocolate 3	Chocolate 4	Chocolate 5	Chocolate 6
Brand						
Type	Milk	Milk	Milk	Milk	70% cocoa	70% cocoa
Flavor	Salted caramel	Salted caramel	Salted caramel	Almonds		Almonds
Quality rating						
Price (100g)	€ 2.65	€ 0.55	€ 2.05	€ 2.05	€ 2.65	€ 0.55
You would buy:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Chocolate 1	Chocolate 2	Chocolate 3	Chocolate 4	Chocolate 5	Chocolate 6

Figure 2. Example choice task respondents had to answer

## References

- Allenby, G. M., & Rossi, P. E. (1998). Marketing models of consumer heterogeneity. *Journal of Econometrics*, 89(1), 57–78. [https://doi.org/10.1016/S0304-4076\(98\)00055-4](https://doi.org/10.1016/S0304-4076(98)00055-4)
- Ballantyne, R., Warren, A., & Nobbs, K. (2006). The evolution of brand choice. *Journal of Brand Management*, 13(4), 339–352. <https://doi.org/10.1057/palgrave.bm.2540276>
- Barney, J. B., & Hoskisson, R. E. (1990). Strategic groups: Untested assertions and research proposals. *Managerial and Decision Economics*, 11(3), 187–198.  
<https://doi.org/10.1002/mde.4090110306>
- Boer, J. de. (2019, April 17). *Deze 5 grafieken laten zien hoe chocolade andere snoepsoorten in Nederland wegvaagt*. Business Insider Nederland. <https://www.businessinsider.nl/deze-5-grafieken-laten-zien-hoe-chocolade-andere-snoepsoorten-in-nederland-wegvaagt/>
- Bogner, W., Thomas, H., & McGee, J. (1996). A LONGITUDINAL STUDY OF THE COMPETITIVE POSITIONS AND ENTRY PATHS OF EUROPEAN FIRMS IN THE U.S. PHARMACEUTICAL MARKET. *Strategic Management Journal*, 17(2), 85–107.
- Camilleri, M. A. (2018). Market Segmentation, Targeting and Positioning. *Travel Marketing, Tourism Economics and the Airline Product*, 4, 69-83.
- Cattani, G., Porac, J. F., & Thomas, H. (2017). Categories and competition. *Strategic Management Journal*, 38(1), 64–92. <https://doi.org/10.1002/smj.2591>

Chandler, A. (1962). *Strategy and Structure: Chapters in the History of the Industrial Enterprise*. Cambridge, Mass: M.I.T. Press.

Cleland, J., Porteous, T., & Skåtun, D. (2018). What can discrete choice experiments do for you? *Medical Education*, 52(11), 1113–1124. <https://doi.org/10.1111/medu.13657>

DeSarbo, W. S., & Grewal, R. (2008). Hybrid strategic groups. *Strategic Management Journal*, 29(3), 293–317. <https://doi.org/10.1002/smj.658>

Desarbo, W. S., Grewal, R., & Scott, C. J. (2008). A Clusterwise Bilinear Multidimensional Scaling Methodology for Simultaneous Segmentation and Positioning Analyses. *Journal of Marketing Research*, 45(3), 280–292. <https://doi.org/10.1509/jmkr.45.3.280>

Dibb, S., & Simkin, L. (1991). TARGETING, SEGMENTS AND POSITIONING. *International Journal of Retail & Distribution Management*, 19(3), 4-10. <https://doi.org/10.1108/09590559110143800>

Dittrich, K., Duysters, G., & de Man, A.-P. (2007). Strategic repositioning by means of alliance networks: The case of IBM. *Research Policy*, 36(10), 1496–1511. <https://doi.org/10.1016/j.respol.2007.07.002>

Domzal, T., & Unger, L. (1987). EMERGING POSITIONING STRATEGIES IN GLOBAL MARKETING. *Journal of Consumer Marketing*, 4(4), 23–37. <https://doi.org/10.1108/eb008208>

- Dornier, R., Nouredine, S., Co, S., Rochelle, L., & Delécolle, T. (2012). Strategic Groups Structure, Positioning of the Firm and Performance: A Review of Literature. *International Business Research*, 5(2), 27-36. <https://doi.org/10.5539/ibr.v5n2p27>
- Draganska, M., & Klapper, D. (2011). Choice Set Heterogeneity and the Role of Advertising: An Analysis with Micro and Macro Data. *Journal of Marketing Research*, 48(4), 653–669. <https://doi.org/10.1509/jmkr.48.4.653>
- Dranove, D., Peteraf, M., & Shanley, M. (1998). Do strategic groups exist? An economic framework for analysis. *Strategic Management Journal*, 19(11), 1029–1044. [https://doi.org/10.1002/\(SICI\)1097-0266\(1998110\)19:11<1029::AID-SMJ992>3.0.CO;2-L](https://doi.org/10.1002/(SICI)1097-0266(1998110)19:11<1029::AID-SMJ992>3.0.CO;2-L)
- Edmunds, A., & Morris, A. (2000). The problem of information overload in business organisations: A review of the literature. *International Journal of Information Management*, 20(1), 17–28. [https://doi.org/10.1016/S0268-4012\(99\)00051-1](https://doi.org/10.1016/S0268-4012(99)00051-1)
- El-Ansary, A. I. (2006). Marketing strategy: Taxonomy and frameworks. *European Business Review*, 18(4), 266–293. <https://doi.org/10.1108/09555340610677499>
- Fiegenbaum, A., Howard, T., & Tang, M.-J. (2001). Linking hypercompetition and strategic group theories: Strategic maneuvering in the US insurance industry. *Managerial and Decision Economics*, 22(4), 265–279.
- Goi, C. L. (2009). A Review of Marketing Mix: 4Ps or More? *International Journal of Marketing Studies*, 1(1), 2-5.



Goyat, S. (2011). The basis of market segmentation: A critical review of literature. *European Journal of Business and Management*, 3(9), 54-53.

Greene, W. H., & Hensher, D. A. (2013). Revealing additional dimensions of preference heterogeneity in a latent class mixed multinomial logit model. *Applied Economics*, 45(14), 1897–1902. <https://doi.org/10.1080/00036846.2011.650325>

Grönroos, C. (1997). From marketing mix to relationship marketing - towards a paradigm shift in marketing. *Management Decision*, 35(4), 322–339.  
<https://doi.org/10.1108/00251749710169729>

Grover, R., & Srinivasan, V. (1987). A Simultaneous Approach to Market Segmentation and Market Structuring. *Journal of Marketing Research*, 24(2), 139–153.  
<https://doi.org/10.2307/3151504>

Hemmerling, S., Asioli, D., & Spiller, A. (2016). Core Organic Taste: Preferences for Naturalness-Related Sensory Attributes of Organic Food Among European Consumers. *Journal of Food Products Marketing*, 22(7), 824–850. <https://doi.org/10.1080/10454446.2015.1121428>

Hess, S. & Palma, D. (2019), *Apollo: A flexible, powerful and customisable freeware package for choice model estimation and application*, *Journal of Choice Modelling*.

Horsky, D., Misra, S., & Nelson, P. (2006). Observed and Unobserved Preference Heterogeneity in Brand-Choice Models. *Marketing Science*, 25(4), 322–335.

<https://doi.org/10.1287/mksc.1050.0192>

Hunt, M. (1972). Competition in the Major Home Appliance Industry. *Unpublished Ph.D. Dissertation, Harvard University.*

Kamakura, W. A., Kim, B.-D., & Lee, J. (1996). Modeling Preference and Structural Heterogeneity in Consumer Choice. *Marketing Science*, 15(2), 152–172.

Leask, G., & Parker, D. (2007). Strategic groups, competitive groups and performance within the U.K. pharmaceutical industry: Improving our understanding of the competitive process. *Strategic Management Journal*, 28(7), 723–745. <https://doi.org/10.1002/smj.603>

Li, J., & Liu, W. (2013). Selecting a target segment: Market structure and new venture entry strategies. *Management Decision*, 51(7), 1402–1421. <https://doi.org/10.1108/MD-05-2012-0315>

Mas-Ruiz, F. J., Ruiz-Moreno, F., & Ladrón de Guevara Martínez, A. (2014). Asymmetric rivalry within and between strategic groups. *Strategic Management Journal*, 35(3), 419–439. <https://doi.org/10.1002/smj.2102>

Mas-Ruiz, F., & Ruiz-Moreno, F. (2011). Rivalry within strategic groups and consequences for performance: The firm-size effects. *Strategic Management Journal*, 32(12), 1286–1308. <https://doi.org/10.1002/smj.936>

- McGee, J., & Thomas, H. (1986). Strategic groups: Theory, research and taxonomy. *Strategic Management Journal*, 7(2), 141–160. <https://doi.org/10.1002/smj.4250070204>
- Nedungadi, P. (1990). Recall and Consumer Consideration Sets: Influencing Choice without Altering Brand Evaluations. *Journal of Consumer Research*, 17(3), 263–276.
- Olusoga, S. A., Mokwa, M. P., & Noble, C. H. (1995). Strategic groups, mobility barriers, and competitive advantage: An empirical investigation. *Journal of Business Research*, 33, 153-164. [https://doi.org/10.1016/0148-2963\(94\)00065-m](https://doi.org/10.1016/0148-2963(94)00065-m)
- Pilli, L., Swait, J., & Mazzon, J. A. (2022). Jeopardizing brand profitability by misattributing process heterogeneity to preference heterogeneity. *Journal of Choice Modelling*, 43, 100359. <https://doi.org/10.1016/j.jocm.2022.100359>
- Porter, M. E. (1979). The Structure Within Industries and Companies' Performance. *The Review of Economics and Statistics*, 61(2), 214–227. <https://doi.org/10.2307/1924589>
- Porter, M. E. (1997). COMPETITIVE STRATEGY. *Measuring Business Excellence*, 1(2), 12–17. <https://doi.org/10.1108/eb025476>
- Priester, J. R., Nayakankuppam, D., Fleming, M. A., & Godek, J. (2004). The A<sup>2</sup> SC<sup>2</sup> Model: The Influence of Attitudes and Attitude Strength on Consideration and Choice. *Journal of Consumer Research*, 30(4), 574–587. <https://doi.org/10.1086/380290>

Qualtrics. (2022). *What is a conjoint analysis? Conjoint types & when to use them.*

Qualtrics.com. <https://www.qualtrics.com/experience-management/research/types-of-conjoint/>

Reger, R. K., & Huff, A. S. (1993). Strategic groups: A cognitive perspective. *Strategic Management Journal*, 14(2), 103–123. <https://doi.org/10.1002/smj.4250140203>

Roetzel, P. G. (2019). Information overload in the information age: A review of the literature from business administration, business psychology, and related disciplines with a bibliometric approach and framework development. *Business Research*, 12(2), 479–523. <https://doi.org/10.1007/s40685-018-0069-z>

Schimmer, M., & Brauer, M. (2012). Firm performance and aspiration levels as determinants of a firm's strategic repositioning within strategic group structures. *Strategic Organization*, 10(4), 406–435. <https://doi.org/10.1177/1476127012457983>

Shocker, A., Ben-Akiva, M., Bocarra, B. & Nedungadi, P. (1991). Consideration set influences on consumer decision-making and choice: Issues, models, and suggestions. *Marketing Letters*, 2(3), 181-197.

Söllner, A., & Rese, M. (2001). Market segmentation and the structure of competition: Applicability of the strategic group concept for an improved market segmentation on industrial markets. *Journal of Business Research*, 51(1), 25–36. [https://doi.org/10.1016/S0148-2963\(99\)00043-0](https://doi.org/10.1016/S0148-2963(99)00043-0)

Sonenshein, S., Nault, K., & Obodaru, O. (2017). Competition of a Different Flavor: How a Strategic Group Identity Shapes Competition and Cooperation. *Administrative Science Quarterly*, 62(4), 626–656. <https://doi.org/10.1177/0001839217704849>

Song, F. (2009). Intergroup trust and reciprocity in strategic interactions: Effects of group decision-making mechanisms. *Organizational Behavior and Human Decision Processes*, 108(1), 164–173. <https://doi.org/10.1016/j.obhdp.2008.06.005>

SurveyMonkey. (2021). *What are choice experiments, and when to use them*. surveymonkey.com. <https://nl.surveymonkey.com/market-research/resources/choice-experiments/>

Swait, J. (2001). Choice set generation within the generalized extreme value family of discrete choice models. *Transportation Research Part B: Methodological*, 35(7), 643–666. [https://doi.org/10.1016/S0191-2615\(00\)00029-1](https://doi.org/10.1016/S0191-2615(00)00029-1)

Swait, J., & Erdem, T. (2007). Brand Effects on Choice and Choice Set Formation Under Uncertainty. *Marketing Science*, 26(5), 679–697. <https://doi.org/10.1287/mksc.1060.0260>

Swait, J., & Feinberg, F. (2014). Deciding how to decide: An agenda for multi-stage choice modelling research in marketing. In S. Hess & A. Daly, *Handbook of Choice Modelling* (pp. 649–660). Edward Elgar Publishing. <https://doi.org/10.4337/9781781003152.00037>

Tiu, W. L., Nancarrow, C., & Kwok, P. M. H. (2001). Food taste preferences and cultural influences on consumption. *British Food Journal*, 103(5), 348–357.

<https://doi.org/10.1108/00070700110396321>

Tiu Wright, L., Nancarrow, C., & Kwok, P. M. H. (2001). Food taste preferences and cultural influences on consumption. *British Food Journal*, 103(5), 348–357.

<https://doi.org/10.1108/00070700110396321>

Train, K. (2002). *Discrete Choice Methods with Simulation*. Cambridge University Press.