Four Essays on the Context-Dependence of Consumer Preferences in Situations of Reduced Choice

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1 INTRODUCTION

1.1 Research Purpose and Main Research Questions

While previous research on the context-dependence of preferences has focused on new product introduction (Dhar and Glazer, 1996; Huber et al., 1982; Pan and Lehmann, 1993; Simonson, 1989; Simonson and Tversky, 1992), this thesis investigates the impact of market exit. In today's marketing practice, brand elimination is a prevalent instrument for both retailers and manufacturers.

Retailers are acting in a mature market and have to cope with pressure on prices and stiff competition (Zentes and Rittinger, 2009). High retail concentration and growing price war for customers involve continuously decreasing margins. The huge variety of consumer goods and increasing listing of private labels (Steenkamp and Dekimpe, 1997) imply that shelf space is more and more regarded as bottleneck. Accordingly, to stay competitive, strengthen negotiation power against manufacturers and raise private-label ranges, retailers frequently decide to delist brands (Sloot and Verhoef, 2008; Steiner, 2004). In addition, unavailability at the point of sale can be temporary which is typically signaled by an open space in the shelf. In retailing research, this phenomenon is referred to as out-of-stock (OOS) (Campo et al., 2000; Emmelhainz et al., 1991; Fitzsimons, 2000; Schary and Christopher, 1979; Verbeke et al., 1998) and particularly caused by inaccurate forecasting practices, inefficient shelf replenishment, and insufficient store ordering (Corsten and Gruen, 2003). Despite 40 years of research, OOS rates seem to fall into an average level at about 7 to 8 percent (Aastrup and Kotzab, 2010; Gruen et al., 2002) for stationary retailing. Increasing relevance of stock-outs is also observable for online and service sectors, such as online shops, airlines or hotels (Breugelmans et al., 2006; Dadzie and Winston, 2007).

From the manufacturer's perspective, brand removals take place with the objective of concentrating on particular strong and successful brands or as a consequence of mergers and acquisitions. Portfolio managers eliminate brands to reduce cannibalization among the own brands and to strengthen the remaining brands which should result in increased overall profits. For instance, one of the leading global FMCG companies Unilever implemented a restructuring program named "Path to Growth" reducing its portfolio from about 1600 to 400 core brands by end of 2004 (Unilever, 2002).

Removing brands from the shelf or from the market alters the decision context of the customer and thus, has an influence both on its product and store choice. Experimental research, predominantly on product innovations, has revealed that changes in the set of alternatives induce systematic shifts in choice-probabilities (Bhargava et al., 2000; Huber et al., 1982; Sheng et al., 2005; Simonson, 1989; Tversky and Simonson, 1993). In contrast to classical economic theory which presumes stable and consistent preferences, it is claimed that decision-making is highly influenced by a changed context[1] (Bettman, 1979; Payne et al., 1992; Slovic, 1995; Tversky et al., 1988). Extensive evidence from context effects research indicates that the introduction of a new alternative can cause significant changes in brand choice behavior (Heath and Chatterjee, 1995).

The most robust phenomena documented in behavioral research on market entry and measured by means of preference or choice data are the similarity effect (Tversky, 1972), the attraction effect (Huber et al., 1982) and the compromise effect (Simonson, 1989). The finding that an introduced alternative takes disproportionately more choice share from similar than from dissimilar alternatives is referred to as similarity effect (Burton and Zinkhan, 1987; Tversky, 1972). The attraction effect (Huber and Puto, 1983; Ratneshwar et al., 1987) is the ability of a new product to increase the attractiveness of a target brand relative to a competitor

[1] Consistent with prior research, the term context is defined as the set of alternatives under consideration (Tversky and Simonson, 1993).

brand when the new product is dominated by the target but not by the competitor. The compromise effect (Drolet et al., 2000; Simonson, 1989) depicts the phenomenon that the relative preference of an alternative, which exhibited an extreme position, is enhanced by the entry of an even more extreme option. Its probability of choice is augmented since it is turned into a compromise option. Consequently, contextual effects in consumer choice represent a violation of some essential criteria of rational decision behavior (e.g., the principle of regularity, the independence from irrelevant alternatives (*IIA*) axiom (Luce, 1959; Luce, 1977)).

The aim of this thesis is to examine whether the same holds true for brand removals. Basically, context theory is taken into account when investigating brand choice behavior and preference shifts in response to brand exit. The research is mainly interested in the effects of temporary and permanent assortment unavailability on consumer reactions and preferences as well as the major antecedents of the resulting decision behavior. More precisely, inter alia, the following research questions are addressed:

- Will brand exit result in comparably robust and theoretically predictable preference shifts as substantiated for brand entry?
- Which *negative* context effects do exist for permanent brand removals (e.g., due to delisting)?
- Is there a *negative* similarity effect for temporary brand exits (e.g., due to an OOS situation)? Which phantom positions cause a diminishment or an increase of this phenomenon?
- Building on the empirical fact that consumers adapt their buying behavior to promotional activities; do OOS responses differ for promoted items?

- Which antecedent variables do influence preference formation after brand removals?
- Does brand delisting result in greater losses for retailers or manufacturers? Is the outcome dependent on the relative positions of the considered alternatives? Which party faces the major damage in OOS situations?
- Taking into account the relative positions of available alternatives, which items should be delisted by the retailer, for instance, to strengthen its own private labels? Which alternative items should be offered in OOS situations to minimize losses?

1.2 Structure and Outline

The above specified research questions are covered in this thesis in four autonomous chapters (2-5) representing four self-contained essays on different aspects and effects of brand exit on consumer preferences. Besides the shared research focus in respect of content, the essays are related due to the same underlying theoretical approach.

Essay 1[2,3] (chapter 2) is joint work with Lutz Hildebrandt. In this essay, two empirical studies discuss the impact of brand delisting on customer responses by investigating the underlying decision process. We use the results of previous research on context effects for market entry documented in behavioral research to develop a system of hypotheses, especially on a *negative* similarity, attraction and compromise effect. On the basis of a real-life quasi-experiment on FMCGs, the existence of a *negative* similarity effect is revealed, i.e. customers tend to switch to a similar brand. In addition, a *negative* attraction effect is discovered.

[2] *Wiebach and Hildebrandt (2010)*, published as SFB 649 Discussion Paper 2010-056, November 2010, Humboldt-Universität zu Berlin.

[3] An abbreviated version of this essay is published in: The 6 Senses - The Essentials of Marketing, Proceedings of the 39th EMAC Conference, Copenhagen Business School, Copenhagen/ Denmark, 1-4 June.

According to that, the relative choice share of a previously dominating option is diminished due to the delisting of the dominated brand. We further analyzed key determinants of a brand loyal reaction in response to delisting applying a binary logistic regression and maximum-likelihood estimation. The second study of this essay tests whether a *negative* compromise effect can be detected for durables. We find partial support for this hypothesis which emphasizes the decrease in relative choice share of intermediate options if an extreme alternative is removed from the choice set.

Essay 2[4] (chapter 3) includes an extended and fundamentally revised version of the first essay. This research considers customers' switching behavior if a brand is delisted by taking into account context theory in four separate studies and different FMCG and durable categories. The findings of two real-life quasi-experiments reveal that customer responses depend significantly on the composition of the choice set and that the resultant switching patterns collectively lead to a bigger damage for manufacturers than for retailers. Being confronted with the reduced choice, the majority of individuals switched to the main competitor of the delisted brand. Two further online experiments support the hypotheses on the existence of *negative* context effects for brand removals across different experimental settings and product categories.

Essay 3[5] (chapter 4) of this thesis represents joint work with Jana Luisa Diels and considers substitution patterns in OOS situations by successfully relating the assumptions of context and phantom theory to OOS reactions. In particular, we propose and include promotion as essential driver of customers' OOS reactions. With regard to behavioral responses, a series of online experiments suggest an augmented probability of purchase postponement and a significant smaller chance of brand switching for stock-outs of

[4] *Wiebach and Hildebrandt (2011)*, accepted for publication in *Journal of Retailing and Consumer Services*.
[5] *Wiebach and Diels (2011)*, published as SFB 649 Discussion Paper 2011-050, August 2011, and an extension with Lutz Hildebrandt submitted to *Journal of Retailing*.

promotional products in FMCG categories. We further introduce outlet-switching as so far neglected OOS reaction and point out its relevance, particularly for OOS items on promotion. In respect of switching behavior and preference shifts, the first study of the paper demonstrates that for temporal unavailability of products, substitution patterns correspond to a *negative* similarity effect which is, however, reduced for stock-outs of low involvement FMCGs on promotion. In the second study, we indicate that the *negative* similarity effect is even enforced for promotions of similar substitutes. Yet, the effect is ruled out by the simultaneous occurrence of an attraction effect when dissimilar substitutes are offered at a reduced price.

Essay 4 (chapter 5) studies important antecedent variables of one specific phenomenon for brand removals – the *negative* attraction effect. In reference to Mishra et al. (1993) who developed a causal model including the drivers of the attraction effect for product introduction, an adapted holistic framework for product exit is tested for FMCGs and durables by using structural equation modeling. Besides verifying the existence of a *negative* attraction effect, the results of the estimated model emphasize decoy share, preference strength and information relevance as major drivers of the considered phenomenon. In addition it is restated that context-dependent preference shifts are less pronounced under conditions that facilitate decision-making.

Table 1.1 provides an overview of the four essays summarizing their research purpose, their research focus, the conducted empirical studies, the involved product categories and the applied methods.

Table 1.1: Overview of the Included Essays

	Research purpose	Type of unavailability	Considered consumer responses	Empirical studies	Product category		Method
Essay 1 *Wiebach and Hildebrandt (2010)*	• Revealing the existence of a *negative* similarity effect, a *negative* attraction effect, and a *negative* compromise effect as customer reaction on delisting. • Identifying relevant determinants of a brand-loyal reaction.	Permanent (Delisting)	Behavioral reactions, substitution patterns (aggregate level)	1 real-life quasi-experiment, 1 online experiment	FMCGs: Durables:	frozen pizza MP3 player	• Principal components analysis • χ^2-test • Binary logistic regression
Essay 2 *Wiebach and Hildebrandt (2011)*	• Revealing the existence of a *negative* similarity effect, a *negative* attraction effect, and a *negative* compromise effect as customer reaction on delisting across several product categories.	Permanent (Delisting)	Behavioral reactions, substitution patterns (aggregate level)	2 real-life quasi-experiments, 2 online experiments	FMCGs: Durables:	frozen pizza, cereal, orange juice MP3 player	• Principal components analysis • χ^2-test • *T*-test
Essay 3 *Wiebach and Diels (2011)*	• Verifying the existence of a *negative* similarity effect in OOS situations. • Testing the influence of promotion and different phantom positions on customer reactions and preferences (i.e., the magnitude of the *negative* similarity effect).	Temporary (OOS)	Behavioral reactions, substitution patterns (aggregate level)	4 online experiments	FMCGs: Services:	detergent, orange juice restaurants, hotels	• χ^2-test • *T*-test • ANOVA
Essay 4 *Wiebach (2011)*	• Verifying the existence of a *negative* attraction effect. • Determining important antecedents of a *negative* attraction effect.	Not specified	Substitution patterns (individual level)	2 online experiments	FMCGs: Durables:	frozen pizza smartphones	• χ^2-test • *T*-test • ANOVA • Structural equation modeling

1.3 Contribution

This paragraph briefly summarizes the main contributions of each part of this dissertation. On the one hand, new theoretical insights are provided for marketing academics while, on the other hand, practitioners can apply the key findings of the included studies when deciding on the elimination of brands.

1.3.1 Scientific Relevance

With this thesis, we aim to contribute to the literature in several ways. By means of the first and the second essay, we relate context theory to delisting decisions and explore important determinants and consequences. Our findings extend the work of Sivakumar and Cherian (1995) by developing additional hypotheses and demonstrating the existence and strength of three major *negative* context effects in the case of brand removals. Thereby, rational principles of choice are violated. It is demonstrated that eliminating similar, dominated or extreme options affects the market share of the remaining brands in a theoretically predictable way. The studies empirically document the impact of choice set reduction on preference shifts in several FMCG categories as well as for durables.

The third essay extends the knowledge on OOS effects, context and phantom theory by uncovering a new explanation of OOS-induced preference shifts and including promotion as an important driver. Prior out-of-stock research has primarily examined the effects of various fundamental factors on the probability of different customer reactions subsequent to an out-of-stock incident. The present work is designed to be the first to consider the specific influence of the factor promotion both on behavioral OOS reactions as well as on OOS-induced substitution patterns. We employ the idea that preferences for the remaining substitutes do not conform to the assumptions of classical choice theory but depend on the

position of the stocked-out item in relation to the remaining alternatives. As promotional offers change the decision context by altering the relative positions of the OOS item and the available alternatives due to promotion-induced changes in price, those offers significantly influence customers' substitution decisions. We show that, depending on whether the unavailable product or one of the substitutes is on promotion, systematic shifts in choice probabilities can be observed. In addition, research on phantom alternatives (Farquhar and Pratkanis, 1993) is enriched. Prior phantom theory studies have particularly paid attention to asymmetrically dominating phantoms and their influence on preference formation (Hedgcock et al., 2009; Highhouse, 1996; Scarpi, 2008). By contrast, we test the impact of *(1)* non-dominating phantoms, *(2)* relatively superior phantoms, *(3)* asymmetrically dominated phantoms, and *(4)* relatively inferior phantoms. Our findings provide evidence that individuals consistently substitute in accordance to a *negative* similarity effect, i.e. they tend to choose substitutes which resemble the (preferred) OOS item on the considered attributes. This outcome can be interpreted as customers' attempt to simplify the decision process (Breugelmans et al., 2006). Due to promotional price reductions and changing phantom positions, the *negative* similarity effect is reduced for stock-outs of promoted low-involvement FMCGs. If a similar substitute is offered at a reduced price, the effect is enforced. For dissimilar substitutes, the contrary is shown.

In the fourth essay, an overall framework to account for influencing factors of context-dependent preference shifts for brand removals is provided which has so far been lacking in the literature. Following numerous studies on product introductions and consumer decision-making which have highlighted the relevance of the product-decoy combination for the attraction effect phenomenon (Huber et al., 1982; Moran and Meyer, 2006), a holistic model is conceptualized and tested for the inversed setting. In particular, the article employs the conceptual basis of Mishra et al. (1993) and offers insights regarding the potential influencing

factors for the *negative* attraction effect to better predict consumers' choice behavior when inferior items are eliminated from a choice set. An improved understanding of the phenomenon and its driving factors helps consumer researchers to devise choice experiments more precisely, i.e. to control for important factors in the choice task and to take them into account when evaluating the magnitude of the effect.

1.3.2 Managerial Relevance

In general, managers need to comprehend customer reactions when they are confronted with the unavailability of their preferred product and what factors influence decision behavior in these situations to avoid losing customers. With the different studies included in this dissertation, marketers can improve their decision-making abilities when they decide which brands to remove. Overall, it becomes evident that before the elimination of a brand, preferences and choice behavior are predictable using context theory. Retailers can employ the subsequent findings to predict the consequences of a delisting strategy or an out-of-stock situation, brand manufacturers can adopt the results when deciding on the reduction of their product portfolios or negotiating with retailers about shelf space.

The first and the second essay provide knowledge that makes retailers' decisions easier when they plan to permanently remove items from their assortments. The findings of the studies deliver an enhanced understanding of customer responses to reduced product offerings and consequently, help retail managers to improve buying conditions in negotiations with manufacturers. In contrast, insights on the severity of a threat to delist are of great value to brand manufacturers. By considering real-life examples, *negative* context effects become more relevant to managers. They should obviously take these effects into account when deciding on the reduction of their assortments and brand portfolios, respectively. The results further indicate that delisting particularly harms the manufacturer if similar competitor brands

are offered on the shelf. The robust *negative* similarity effect, which was demonstrated in three categories and online experiments, recommends retailers to always offer a similar alternative to keep customers in the store. Consequently, both retailers and manufacturers should pay attention to the competition environment and employ consolidated findings on the context-dependence of choice when deciding and negotiating on prices and shelf space.

The managerial implications of the third essay are twofold. For the manufacturer, the analyzed OOS situations imply severe damages since customers primarily decide to substitute if their previously favorite brand is temporarily unavailable. In this way, the manufacturer not only misses margins in the short run but also bears the risk of losing loyal customers to competing brands in the long run. With regard to substitution patterns, the demonstrated *negative* similarity effect implies that the supply of at least two comparable brands of the manufacturer's product line is recommendable to keep customers in OOS situations. For the retailer, on the other hand, our overall results suggest fewer category sales losses as the majority of OOS-affected customers decide to switch to an alternative the retailer offers within that category and only a small proportion to switch the store. However, if the unavailable brand is offered on promotion, they significantly less often substitute within the retail chain and postpone their purchases with higher probability. Accordingly, the retailer faces lost margins in the short run. The newly introduced behavioral response outlet switching proves to be especially appropriate since a significantly higher fraction of customers in OOS situations for promoted items visit another outlet of the same retail chain to obtain the promotional offer. Concerning switching patterns, the revealed robust *negative* similarity effect suggests that retailers should always stock at least two similar products to facilitate substitution decisions in the store in OOS situations. In addition, our findings indicate that retailers can guide brand and item choice in OOS situations by the systematic use of promotional activities. Due to the altering relative positions of the OOS item and the available

alternatives, those offers significantly affect substitution decisions and can be used to direct individuals' preferences and choices in situations of unavailability. This, for instance, offers an opportunity for retailers to strengthen their own private labels.

The fourth essay delivers valuable insights on the utilization of the *negative* attraction effect to forecast and control customers brand choice in situations when dominated items are temporarily or permanently removed from the market. The deletion of inferior items represents a predominant instrument in marketing practice. For instance, as the majority of new product introductions fail, manufacturers are forced to re-eliminate the unsuccessful items. Accordingly, strategic portfolio decisions can be based on some key findings of the presented study. The managerial significance is further notable for retailers deciding on the delisting of brands which typically represent inferior options in the assortment. The study proposes several guidelines, which both parties can utilize to strengthen a specific target brand. For instance, it is highlighted whether decision-making at the point of sale should be facilitated or whether it can be profitable to eliminate brands even if they generate moderate sales. Moreover, recommendations with regard to the appropriateness of information presented at the store are given and important differences referring to high and low-involvement goods are underlined.

2 CONTEXT EFFECTS AS CUSTOMER REACTION ON DELISTING OF BRANDS

Wiebach and Hildebrandt (2010)

Discussion Paper

ABSTRACT

The delisting of brands is frequently used by retailers to strengthen their negotiating position with the manufacturers and suppliers of their product assortment. However, retailers and manufacturers have to consider the risk of potential reactions when customers are faced with a reduced or modified assortment and thus, different choice. In this paper, two studies are presented which investigate customers' switching behavior if a (sub-)brand is unavailable and key determinants of the resulting behavior are discussed. Various conditions are tested by taking into account context theory. The results reveal that customer responses depend significantly on the context. A real-life quasi-experiment suggests that manufacturers may encounter substantially larger losses than retailers. Managerial implications for both parties can be derived and recommendations for further research are developed.

2.1 Introduction

Delisting, defined as permanent deletion of a brand from the assortment of a retailer (Sloot and Verhoef, 2008), is a prevalent instrument in today's retailing practice. There may be a multitude of causes for delisting brands. Major reasons mentioned by retailers are a need for free shelf space to sell their own private labels, cost-saving programs to stay competitive, alleviating shopper confusion and an attempt to strengthen their negotiating power against manufacturers. The latter is especially important. Brand manufacturers mainly depend on retailers to sell their products. Hence, a delisting can induce declines in sales as customers are forced to switch brands if they want to stay loyal to the store. In addition, operational costs ascending with rising stock keeping units (SKUs), inventory costs and out-of-stock levels are lower. Reducing these costs helps conventional supermarkets to compete against the growing retail formats of discount stores. However, assortment reductions can also cause losses for retailers if brand loyal customers do not switch to the other brands on the shelf but to competing stores when the preferred item is no longer available. As delisting bears risks for both parties, it is of great relevance to investigate its implications, to predict choice modification and to measure the evoked changes in the competitive environment.

Removing brands permanently from the shelf alters the decision context of the customer and thus, has an influence both on his brand choice behavior and store choice. Experimental research, predominantly directed to market entry, has revealed that changes in the set of alternatives can induce systematic shifts in choice probabilities (Huber et al., 1982). It is claimed that decision-making is highly influenced by a changed context. Since context effects may cause potential violations of the rational choice principles (e.g. regularity and value maximization), they stress the need for context-dependent models (Kivetz et al., 2004). Extensive experimental evidence from context effects research indicates that the introduction

of a new alternative can cause significant changes in brand choice behavior (cf. Huber et al., 1982; Dhar and Glazer, 1996; Pan and Lehmann, 1993; Tversky, 1972). The aim of this paper is to analyze whether a similar effect can be observed for brand removals. Basically, the research takes into account context theory when investigating brand choice behavior in response to delisting strategies.

Thus, our paper contributes to marketing and retailing literature by relating context theory to delisting decisions and exploring their important determinants and consequences. In addition, this research provides knowledge that makes retailers' decisions easier when they consider removing items from their assortments. An improved understanding of customer responses to reduced product offerings may help retail managers to enhance buying conditions in negotiations with manufacturers. Insights on the severity of a threat to delist are of great value to brand manufacturers. Finally, recommendations for product portfolio decisions can be derived.

The article is organized as follows: As prior research on out-of-stock and permanent assortment reductions offers valuable insights for our analysis, it is reviewed and discussed in the next section. Then, the theoretical background on context effects is briefly presented, our research objectives are specified and hypotheses are developed. Two empirical studies examine the shifts in choice probabilities when brands are removed and, by means of a real-life quasi-experiment, significant determinants of a brand loyal reaction are explored. We conclude with a discussion of our key findings and an outlook on future research.

2.2 Effects of the Unavailability of Brands

"Product not available!" is an annoying situation, of which every regular grocery shopper is probably aware. The consumer may be confronted with two situations. The assortment unavailability can either be temporary (often indicated by an empty space in the shelf and the result of logistic problems) or permanent (shelves are readjusted, in this case the disappearance of the brand or delisting might be the cause). In the first case, a short-term effect can be expected, whereas the second case may have long-term implications which probably differ from temporary impacts. The peculiarities of both kinds of unavailability of (preferred) brands and their consequences are covered below.

2.2.1 Temporary Assortment Unavailability

In retailing research, the phenomenon of temporarily unavailable brands is referred to as an out-of-stock (OOS) or a stock-out. The European Optimal Shelf Availability (OSA) survey reveals an average out-of-stock level of 7.1 percent (ECR Europe and Roland Berger, 2003). To emphasize its meaning, recent studies on OOS have primarily considered customer reactions to short-term unavailability (cf., Anupindi et al., 1998; Campo et al., 2000; Campo et al., 2003; Emmelhainz et al., 1991; Fitzsimons, 2000). Given that a remarkable percentage of purchase decisions are made in the store, such stock-out situations represent a serious threat to brand loyalty and the evaluation of the brand or store in general (Corsten and Gruen, 2004). In fact, they can lead to substantial losses for manufacturers and retailers. For instance, the study by Emmelhainz and colleagues (1991) detects that in certain instances the manufacturer loses more than 50 percent of his customers to a competitor and the retailer faces a loss up to 14 percent. The degree of damage strongly depends on the way consumers react. Previous studies, however, have revealed very inconsistent outcomes. It is assumed that immediate

behavioral responses to an out-of-stock situation are item-switching, brand-switching, store-switching, postponement and cancelling the purchase altogether. The results from the perspective of the company could be an unexpected cannibalization or the loss of customers if the ties for an existing competing brand are stronger than those for another brand in the company's own product line. Conversely, if customers decide to look for the missing item in another store, the retailer faces major losses. Existing research therefore has linked customer responses to an OOS to brand-related, store-related, consumer-related and situation-related variables (Zinn and Liu, 2001) in order to identify fundamental determinants of OOS reactions. Consumer characteristics that are of particular importance comprise shopping-attitude, mobility, shopping frequency, general time constraint and age (eg., Campo et al., 2000; Hegenbart, 2009; Sloot et al., 2005). Situational characteristics that turned out to be relevant include, amongst others, required purchase quantity, specific time constraint and urgency of the purchase (e.g., Campo et al., 2000; Hegenbart, 2009; Zinn and Liu, 2001). Product-related variables of great importance are brand loyalty, availability of acceptable alternatives, purchase frequency, brand equity and product involvement (e.g., Campo et al., 2000; Hegenbart, 2009; Sloot et al., 2005; Zinn and Liu, 2001). Finally, store-related characteristics that significantly influence OOS reactions consist of store loyalty, perceived store prices and store distance (e.g., Campo et al., 2000; Hegenbart, 2009; Sloot et al., 2005). These findings on the implications of temporary unavailability provide a promising basis for the assumptions about our analysis of permanent unavailability. Obviously, similar reactions and underlying antecedents may be prevalent when investigating delisting.

2.2.2 Permanent Assortment Unavailability

In marketing literature, studies on permanent assortment reductions (PAR), i.e. a considerable percentage of items in a category is eliminated by the retailer, concentrate on permanent item

deletion and its consequences for category and store sales and assortment perception (e.g., Boatwright and Nunes, 2001; Borle et al., 2005; Broniarczyk et al., 1998). It has been commonly assumed that more choice is better (Oppewal and Koelemeijer, 2005). This postulation is confirmed by various store choice studies (e.g., Hoch et al., 1999; Steenkamp and Wedel, 1991) and has been adopted by retailers. Larger assortments are supposed to attract more customers, as they are thought to better meet the customer's needs along with varying preferences (Bettman et al., 1998) and reduce time and transportation costs associated with a one-stop shopping (Messinger and Narasimhan, 1997). A large assortment offers flexibility for variety seekers and increases the probability to get one's favored alternative. Recent research, however, calls this "more choice is better" belief into question and reveals that sales can actually go up when items are removed from the assortment and do not affect store choice (Boatwright and Nunes, 2001). Broniarczyk et al. (1998) found that smaller assortments may be perceived as being more attractive as long as they include the preferred items and category space is held constant. Similarly, the "paradox of choice" is shown by Schwartz (2004). It implies that a too large assortment can overstrain the consumer's mind and increase choice difficulty on a typical grocery shopping trip. The information overload may result in consumer confusion and lower satisfaction with the decision process (Iyengar and Lepper, 2000). This is consistent with the work of Gourville and Soman (2005), who discovered that increasingly large assortments ("overchoice") can have a negative impact on consumer choice and brand share. They claim that this effect is significantly moderated by assortment type. Chernev (2003) further demonstrates in four experiments that the selections made from larger assortments can result in weaker preferences subject to the identified key factor ideal point availability. The same has been shown by Zhang and Krishna (2007) who examine brand-level effects of SKU reductions and find varying outcomes across brands, categories and customers. In general, the discussed phenomenon is referred to as the "choice

overload hypothesis." It also has important theoretical implications as it violates the regularity axiom, a keystone of classical choice theory. To sum up, there is an ongoing debate about the benefits and downsides of large assortments in retailing research.

By contrast, delisting (referring to "the removal of all items of a single brand, leading to unavailability of the brand within the store," Sloot and Verhoef, 2008) and its impact on customer reactions have only been of limited interest in academic research, even though it is a prevalent method in the retailing industry to stay competitive, to increase private label ranges or to strengthen negotiating power against manufacturers. An exception is the study of Sloot and Verhoef (2008). They examine the behavioral consequences of a brand delisting by means of store switching intention (SSI) and brand switching intention (BSI) in sixteen different stores and ten product categories taking into account different antecedents. Their study reveals that many consumers stay brand loyal and that a small proportion cancels their purchase if the favored brand becomes unavailable. Additionally, they found that it is not only the assortment size but the composition of the assortment which matters. As pointed out the delisting, in particular of high market share brands in hedonic product groups, has a negative impact on category sales and store choice. They further show that retailers with relatively large assortments are less affected by brand delistings and that large categories face greater negative consequences. Sloot and Verhoef (2008) only include delisting of the primary brand. However, in order to study a context-dependent switching behavior, a design which contains different initial situations will be reasonable.

To summarize, Table 2.1 provides an overview of research on the unavailability of items in marketing literature.

Length of unavailability	Type of unavailability	Studies
Short-term (OOS)	Item(s)	Peckham, 1963; Walter and Grabner, 1975; Schary and Christopher, 1979; Emmelhainz et al., 1991; Campo et al., 2000; Fitzsimons, 2000; Zinn and Liu, 2001; Campo et al., 2003; Corsten and Gruen, 2003; Campo et al., 2004; Sloot et al., 2005; Kalyanam et al., 2007; and Hegenbart, 2009
Short-term	Brand(s)	Verbeke et al., 1998
Long-term (PAR)	Items(s)	Drèze et al., 1994; Broniarczyk et al., 1998; Iyengar and Lepper, 2000; Boatwright and Nunes, 2001; Chernev, 2003; Borle et al., 2005; Oppewal and Koelemeijer, 2005; Gourville and Soman, 2005; and Sloot et al., 2006
Long-term (PAR)	Item(s) / Brand(s)	Zhang and Krishna, 2007
Long-term (total market)	Brand(s)	Sivakumar and Cherian, 1995
Long-term (delisting)	Brand(s)	Sloot and Verhoef, 2008

Table 2.1: Overview of Studies on Unavailability, cf. Sloot and Verhoef, 2008

The studies mentioned above include key determinants (brand-, consumer-, store- and situation-related) to figure out the heterogeneity in OOS responses applying multinomial logit (MNL) model. Although they identify empirical associations, an appropriate theory to explain customer behavior in such situations has not been adopted. We claim that context theory will help to account for customer reactions when confronted with product unavailability and consequently can be applied to explain the impacts on choice shifts.

2.3 Theoretical Background – Context Theory

The existing published research primarily regards the OOS or PAR problem in the context of the classical decision theory, assuming that if the preferred item is not available, the buyer will switch to the second-best alternative, or if he has no time restriction and procurement costs, he will just change the store to buy the favored item. This is a common assumption; however, is it reasonable to assume that the preference rank ordering may remain stable if the first choice brand is not available for a longer period or, like in the PAR-situation, forever?

The whole rank ordering of preferences may change and the attractiveness will be built on different reference criteria to compare the alternatives. A simple extension of the classical choice model is the assumption of relative utilities in the attraction model, where the evaluation is made by selected criteria of the alternatives. Hence, for our modeling approach, we may assume that when choosing a product, a consumer does not primarily consider the product attributes and the attribute levels of a single option but takes into consideration the attribute levels of the available and relevant alternatives (Sheng et al., 2005). Consequently, the choice probability of a product is affected by its own attractiveness in relation to the attractiveness of the other products in the consumer's consideration set - the brands a consumer regards when he chooses one unit of the product class (Bettman, 1979; Howard and Sheth, 1969). Here, consumers' decisions may alter, depending on the availability and relevance of other products if they do not always pick the product with the highest utility.

In contrast to classical economic theory, which assumes fixed preferences and utility maximization, research on context effects for market entry states that consumers often do not have well-defined preferences and construct choice on the spot when they have to make a decision (Bettman, 1979; Bettman and Park, 1980; Payne et al., 1992; Slovic, 1995; Tversky et al., 1988). Instead, choices are dependent on the positions and the presence or absence of other alternatives, referred to as the specific set of alternatives in which an option is considered (e.g., Bhargava et al., 2000; Huber et al., 1982; Simonson, 1989). As a result, the value of an option does not only depend on its own characteristics but also on the attribute levels of the other options in the choice set (Simonson and Tversky, 1992). Context effects represent a violation of some essential criteria of rational decision behavior. The principle of regularity claims that the choice probability of an alternative T cannot be raised by adding a new alternative to the choice set $\widetilde{S}$ as the relative attractiveness of the existing products cannot be changed, i.e. if $T \in \widetilde{S} \subseteq S, P(T,\widetilde{S}) \geq P(T,S)$ (Huber et al., 1982). It is contained in

the proportionality framework by Luce, which assumes that new alternatives take shares from existing alternatives in proportion to their previous shares (Luce, 1959). The principle of regularity and the proportionality framework are restated in the assumption of *Independence from Irrelevant Alternatives (IIA)*. Accordingly, the "[...] preference between options does not depend on the presence or absence of other options" (Tversky and Simonson, 1993, p. 1179), i.e. if $P(x,y) \neq 0,1$ for all $x, y \in T$, then for any $S \subset T$ such that $x, y \in S$, $\frac{P(x,y)}{P(x,y)} = \frac{P_S(x)}{P_S(y)}$ (Luce, 1959, p. 9). Thus, it is not possible to influence the relative attractiveness, and therefore the choice probability and relative choice shares of existing products, by adding new products. Translated into the delisting framework, these principles propose that after a delisting or elimination the remaining products cannot lose but gain choice share in proportion to their original choice probability. To account for the existence of context effects the principle of *IIA* has to be disproved.

The most robust phenomena, observed in context experiments and documented in behavioral research on market entry and measured by means of preference or choice data, are the *similarity effect* (Tversky, 1972), the *attraction effect* (Huber et al., 1982) and the *compromise effect* (Simonson, 1989). In our explanation, the implications of context effects for product delisting are derived from the theoretical framework and empirical results of essential experiments on product entry. The notation $P(A|\{A,B,C\})$ denotes the probability of choosing option A from the set of options $\{A,B,C\}$. The three effects are visualized in Figure 2.1.

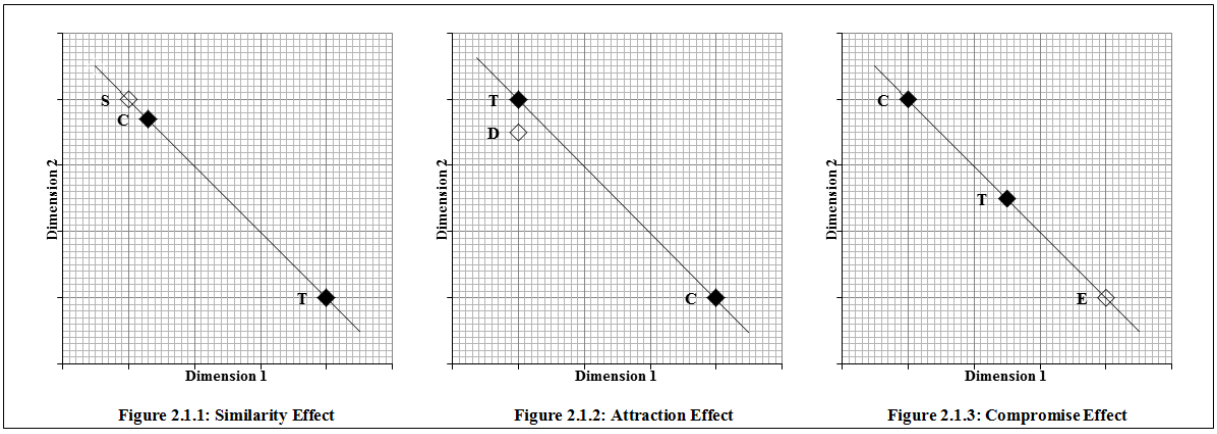

Figure 2.1.1: Similarity Effect | Figure 2.1.2: Attraction Effect | Figure 2.1.3: Compromise Effect

Figure 2.1: Similarity Effect, Attraction Effect and Compromise Effect

2.3.1 Similarity Effect

The phenomenon of an introduced alternative that takes disproportionately more choice share from similar than from dissimilar alternatives, is referred to as the *similarity effect* (Tversky, 1972). Let us assume the initial choice set consists of two options, *T* (=target) and *C* (=competitor), which differ on two equally important dimensions (e.g. price and quality) such that $P(T|\{T,C\}) \approx P(C|\{T,C\})$. Subsequently, an option *S*, rather similar to *C*, is added to the choice set (see Figure 2.1.1).

The similarity effect shows that the similar options *C* and *S* hurt each other but do not hurt option *T*. The relative choice shares change in favor of the target alternative *T* when *S* is introduced. This choice behavior results in a violation of the *IIA* assumption, since $P(T|\{T,C,S\}) > P(C|\{T,C,S\}) \approx P(S|\{T,C,S\})$ and $\frac{P(T|\{T,C,S\})}{P(C|\{T,C,S\})} > \frac{P(T|\{T,C\})}{P(C|\{T,C\})}$. For our research it is of major interest to consider the reversed case. In which way will consumers react if alternative *S* is removed from the choice set? Will *C* regain the entire lost choice share?

2.3.2 Attraction Effect

The *attraction effect* (Huber and Puto, 1983) denotes the situation when the introduction of an asymmetrically dominated decoy (*D*) increases the choice probability of the dominating target (*T*) (see Figure 2.1.2). For instance, in the initial choice set a consumer considers options *T* and *C* with $P(T|\{T,C\}) \approx P(C|\{T,C\})$. Then, an option *D* is added which is similar to *T*, but dominated by *T*. The addition of a decoy to the choice set enhances the probability of choosing the dominating option *T*, since decision makers' preferences for *T* are increased. One argument that could explain the induced shift in choice share is the facilitation of choice strategies by the use of the dominance heuristic. Choosing the dominating alternative avoids having to make difficult trade-offs (Wedell, 1991) and simplifies the justification of the decision (Simonson, 1989). Further substantiated explanations are *loss aversion*, *range-frequency theory* (Parducci, 1974) and *context-dependent weighting* of dimensions (Tversky et al., 1988). The attraction effect violates the fundamental "regularity" principle of choice behavior which claims that after adding an option to the choice set, the probability of choosing *T* or *C* should either stay equal (when *D* is not chosen) or should decrease (when *D* is sometimes chosen). But in the described case $P(T|\{T,C\}) < P(T|\{T,C,D\})$. Accordingly, the *IIA* assumption is violated, since *D* alters the *T*-to-*C* preference ratio: $\left(\frac{P(T|\{T,C,D\})}{P(C|\{T,C,D\})} > \frac{P(T|\{T,C\})}{P(C|\{T,C\})}\right)$.

Typically, research on the attraction effect has looked at the introduction of a new alternative into a choice set. There are only a few studies on the attraction effect and market exit, e.g. Sivakumar and Cherian (1995). In a manipulated experiment, they revealed that brand exit could also produce the attraction effect. The magnitude of the attraction effect (for product exit) turned out to be significantly smaller than for product entry. This implies that the introduction of an asymmetrically dominated decoy that increases the sales of T can be

removed from the market again and the positive effect of the former introduction will partly be maintained (Sivakumar and Cherian, 1995).

2.3.3 Compromise Effect

The compromise effect describes the ability of an extreme alternative (E) to increase the target's choice probability by changing its relative position towards an intermediate option (Simonson, 1989). The relative preference of the target which exhibited an extreme position is enhanced by the entry of an even more extreme option (E). Suppose in the initial situation two options T and C are presented with $P(T|\{T,C\})\approx P(C|\{T,C\})$. Then, an extreme option E is added (see Figure 2.1.3). Option T is turned into a compromise option and hence, the probability of choosing it is augmented, since T's choice has become easier to justify (Simonson, 1989). $P(T|\{T,C,E\})>P(E|\{T,C,E\})$ and $P(T|\{T,C,E\})>P(C|\{T,C,E\})$ result again in a violation of the *IIA* assumption as $\frac{P(T|\{T,C,E\})}{P(C|\{T,C,E\})} > \frac{P(T|\{T,C\})}{P(C|\{T,C\})}$.

If brands are delisted or exit a market, consumers who have been buying these products for years are faced with a new set of alternatives. The context has changed. Their familiar brand is no longer available at their frequently visited store. The elimination from the consideration set alters the decision context of the customer and thus, may also have an influence on the consumer's preference and accordingly choice. Consequently, the importance of the theory on context effects for our research on the prediction of brand delisting effects is evident. Context effects have substantial relevance for predicting consumer brand choice (Van Heerde et al., 2004).

2.4 Research Objectives and Hypotheses

In the following studies, we are primarily interested in the effects of permanent unavailability of a brand on customer reactions and consequently, store and brand sales. Furthermore, we investigate the underlying decision process by employing research hypotheses derived from context theory. Findings should demonstrate the existence and strength of choice effects in the case of brand elimination and in real world situations. The results of this analysis may help retailers to enhance their decision-making when they consider eliminating items from their assortments or to improve buying conditions in negotiating with manufacturers. Insights on the severity of such a threat are of great value for brand manufacturers. We use the results of previous research on context effects for market entry documented in behavioral research to develop a system of hypotheses, especially similarity, attraction and compromise effect. We use an inverse formulation for the estimation of choice probabilities.

Hypotheses:

Studies on the *similarity effect* have revealed that similar alternatives lose more market share when a new alternative is introduced (Tversky, 1972). Consequently, for the removal of a brand, we expect that a similar brand will regain more market share than a dissimilar alternative (*negative similarity effect*):

H1: *If an alternative S is removed, the probability of choosing the similar alternative C will increase disproportionately, i.e.*

$$P(C|\{T,C\}) > P(C|\{T,C,S\}) \text{ or } \frac{P(C|\{T,C\})}{P(T|\{T,C\})} > \frac{P(C|\{T,C,S\})}{P(T|\{T,C,S\})}.$$

With regard to the widely discussed *attraction effect,* a decoy alternative has the ability to increase the attractiveness of the target relative to a competitor when the new product is dominated by the target and not by the competitor (Huber and Puto, 1983). It has been found that the target tends to be selected more often when the decoy is present (Malaviya and Sivakumar, 1998). Accordingly, for market exit, the target brand will lose its dominant position and will be considered less attractive if a dominated or relatively inferior alternative disappears (*negative attraction effect*):

H2: *If a dominated alternative is removed, the probability of choosing the previously dominating alternative T will not rise or only rise disproportionately, i.e.*

$$P(T|\{T,C\}) < P(T|\{T,C,D\}) \text{ or } \frac{P(T|\{T,C\})}{P(C|\{T,C\})} < \frac{P(T|\{T,C,D\})}{P(C|\{T,C,D\})}.$$

The *compromise effect* denotes the increase in a brand's choice share when it becomes an intermediate option in the choice set (Simonson, 1989). If a brand loses its "compromise" position as a consequence of a removal of another brand, we hypothesize that it will be perceived less attractive and accordingly, will lose choice share (*negative compromise effect*):

H3: *If an alternative is removed from a choice set, the probability of choosing a previously intermediate alternative will not rise or only rise disproportionately:*

$$P(T|\{T,C\}) < P(T|\{T,C,E\}) \text{ or } \frac{P(T|\{T,C\})}{P(C|\{T,C\})} < \frac{P(T|\{T,C,E\})}{P(C|\{T,C,E\})}.$$

The violation of the proportionality hypothesis underlying classical economic theory is used as an indicator of context effects. To address our research objectives and to test the formulated hypotheses, two empirical studies are conducted. It will be shown if the predicted *negativ*e context effects prove true for market exit and which factors dictate customers' reaction.

2.5 Empirical Studies

2.5.1 Study 1

The first study, based on data from a real-life quasi-experiment involves a major European retail chain that decided to delist a leading brand of a main European manufacturer company. In the spring of 2009, the retailing chain started to restructure its product line in the food category by eliminating one of the leading brands in the frozen pizza category. The fundamental goal of our research is to investigate customers' reactions on the modified assortment and to find out if the decision to delist one preeminent brand has certain effects on the market share of alternative brands and if context theory can be used to predict choice behavior. Especially, we were interested in the question of whether delisting hurts the retailer or the manufacturer more. It is of major interest to measure if, on the basis of postulated context effects, it is possible to explicate choices after the removal of a brand and accordingly, changes in choice shares. Furthermore, a multivariate logit analysis is performed to investigate the drivers of the different reaction patterns more intensely.

Before the delisting, there were four substantial brands available in the studied frozen foods assortment at the examined discounter; two brands A and B from the same food manufacturer, one competitor brand C and a store brand D were offered. In spring 2009 the

discount chain decided to delist brand A. A preliminary analysis will reveal the competition in the concerned frozen foods market before delisting. Afterwards, specified hypotheses are deduced and tested.

2.5.1.1 Method

Given that the considered product is one of the major dishes of young people, 329 individuals, primarily students at a large German university, were recruited to participate in an online survey. Earlier studies on context effects have also employed student samples as a valuable resource of information (cf. Huber et al., 1982). As the product category is related very strongly to students' consumption, we do not see any problems of validity. In addition, respondents who did not complete the questionnaire were excluded from the analysis. Furthermore, the current study required familiarity with the studied product category. That is why we only selected respondents who usually buy frozen food for their household. The final sample included 216 respondents with a mean age of 26.8, 64 percent of them were female, the average household consisted of 2.1 people and students accounted for about 73 percent of all participants (for the investigated product category students apparently represented an important target group).

2.5.1.2 Principal Components Analysis and Concretized Hypotheses

Initially, a principal component analysis is performed to gain insights into important dimensions and the competition in the studied frozen goods market based on the evaluation of the product attributes. To obtain data for the analysis, respondents were asked to judge each of the four brands on twelve different attributes on a five-point Likert scale ranging from 1 (do not agree at all) to 5 (totally agree). In addition to product name and pricing information, a picture of the product packaging was presented to enhance realism. All checked criteria

(*MSA=0.895, Barlett's test of sphericity, p-value<0.000*) supported the applicability of the analysis. The common principles (e.g. Kaiser-criterion) are employed to identify the number of extracted factors. Further investigation of the factor loadings after Varimax rotation enables the interpretation of three extracted dimensions: *quality & taste* (component 1), *balanced diet* (component 2) and *price* (component 3). Subsequently, mean factor scores were computed for each brand and are used to illustrate the positions of the brands in a three-dimensional space which reveals the initial competition in the market (see Figure 2.2).

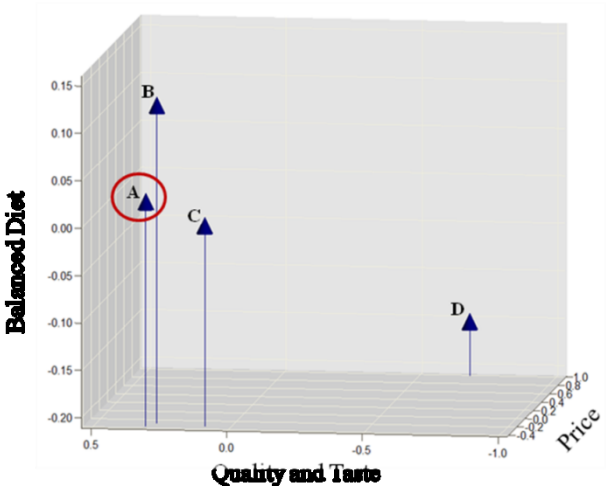

Figure 2.2: Competition Before Delisting (Study 1)

The detected positions show that two groups of competitors can be determined: Brand C appears to be the main competitor of brand A. This implies that the two brands are perceived to be the most similar with regard to the included attributes.

The first hypothesis about shifts in market share according to the similarity hypothesis can now be formulated more specifically. Since for the market entry scenario context theory predicts that a similar alternative loses more market share than a dissimilar option, we assume for the inverse setting that the choice share of brand C will rise disproportionately if brand A is delisted, in other words:

H1: *If alternative A is removed, the probability of choosing the similar alternative C will rise disproportionately, i.e.*

$$\frac{P(C|\{B,C,D\})}{P(J|\{B,C,D\})} > \frac{P(C|\{A,B,C,D\})}{P(J|\{A,B,C,D\})}, J = \{B,D\}$$

Additionally, consistent with extensive research on the attraction effect, brand A can be considered a relatively inferior alternative ("decoy") to the "target" brand B based on the included attributes (Huber and Puto, 1983). Hence, the market share of brand B should decrease or only increase less than proportionally. H2 finally claims that the market share of brand B will not rise or only rise less than proportionally when brand A is delisted:

H2: *If the "dominated" alternative A is removed, the probability of choosing alternative B will not rise or only rise disproportionately, i.e.*

$$\frac{P(B|\{B,C,D\})}{P(J|\{B,C,D\})} < \frac{P(B|\{A,B,C,D\})}{P(J|\{A,B,C,D\})}, J = \{C,D\}$$

The second part of the study permits a test of the generated hypotheses and of the effects of deleting an alternative from the four-item core set, within subjects. To measure the reactions and shifts in choice shares, participants were presented a first choice set including the four alternatives (A, B, C and D) available at the examined discounter and had to make a selection. After answering some general questions about nutrition and buying behavior, respondents were confronted with the reduced choice set which contained the three remaining brands (B, C and D) and the additional options to switch stores or cancel purchase completely (deduced from previous research on OOS responses, see section 2.2.1). They had to choose again.

2.5.1.3 Results

The observed relative frequencies of each choice scenario are reported in Table 2.2. In the first decision situation 27.32 percent of the respondents picked brand A, 31.94 percent brand B, 12.50 percent brand C and 28.24 percent selected the store brand D. In the second choice scenario (after delisting), brand B was chosen by 39.81 percent, 24.08 percent of the respondents decided to select brand C and 33.33 percent picked brand D. Store switching was only selected by two participants (0.93 percent) and only four respondents (1.85 percent) decided not to purchase at all. The very low rate of store switching may have been caused by the method used to collect the data. The small portion of respondents who intended to drop their entire purchase is a distinctive observation for fast moving consumer goods (FMCG)-categories. This outcome is in line with previous research on OOS reactions (cf. Campo et al., 2000). These small portions are hereafter neglected in order to test our hypotheses.

	Before delisting	**After delisting**
Brand A	27.32%	
Brand B	31.94%	39.81%
Brand C	12.50%	24.08%
Brand D	28.24%	33.33%
(Switch store)		(0.93%)
(Cancel purchase)		(1.85%)

Table 2.2: Relative Frequencies of Choice Options Before and After Delisting (Study 1)

Traditional utility theory and choice models would predict choice shares[6] as follows: if an alternative is deleted from the choice set (brand A), the *IIA* assumption implies a proportional distribution on the remaining brands (brand B, C and D) (Luce, 1959), i.e.

[6] If we assume that the research sample is representative for the market, the choice share would be identical with the market share we utilize in the abbreviation of market share (*MS*).

$$MS_{i,2} = \frac{MS_{i,1}}{\sum_{i=B, i\neq A}^{D} MS_{i,1}} \cdot MS_{A,1} + MS_{i,1}$$

with

$MS_{i,2}$ = market (choice) share of the remaining brands (i={B, C, D} after delisting,

$MS_{A,1}$ = market (choice) share of the delisted brand A before delisting (period 1).

In Table 2.3 actual ($\Delta MS_{observed}$) and postulated (ΔMS_{IIA}) choice shifts are compared to discover disproportionate movements of market shares. That means that we have to compare the market share expected by using the traditional choice approach and the results of the brand delisting experiment under context specific assumptions.

Brand i	$MS_{i,1}$	$MS_{i,2}$	*Context-dependent* $\Delta MS_{i,observed}$	*Classical Theory* $\Delta MS_{i,IIA}$	*Difference*
Brand B	32.38%	40.95%	**+8.57%**^{ns}	+11.77%	-3.20%
Brand C	12.86%	24.76%	**+11.90%*****	+4.68%	+7.23%
Brand D	28.10%	34.29%	**+6.19%**^{ns}	+10.22%	-4.03%

$MS_{i,1}$: market share of brand i before delisting, $MS_{i,2}$: market share of brand i after delisting
*** significant deviation of $\Delta MS_{i,IIA}$, p≤0.01
^{ns} deviation not significant, p>0.05

Table 2.3: Shifts in Choice Shares (Study 1)

If brand A is delisted, the choice share of brand C is almost doubled. More precisely, the increase in market share (ΔMS_C=*+11.90 percent*) is significantly higher than postulated by *IIA* ($\Delta MS_{C,IIA}$=*+4.68 percent*) with χ^2=*7.597*, *d.f.=1*, *sig.=0.006*. This means that $\frac{P(C|\{B,C,D\})}{P(J|\{B,C,D\})} > \frac{P(C|\{A,B,C,D\})}{P(J|\{A,B,C,D\})}, J = \{B,D\}$. Consequently, keeping with hypothesis 1, a *negative similarity effect* is also prevalent for a removal of a product. We found strong support for hypothesis 1.

When A is delisted, the same-manufacturer brand B can only adopt a small part of former buyers of brand A. Compared to the predicted shift in market share ($\Delta MS_{B,IIA} = 11.77\ percent$), the increase in market share is only 8.57 percent, though the difference is not significant ($\chi^2 = 0.876,\ d.f. = 1,\ sig. = 0.349$). However, the choice share rises less than proportionally ($\frac{P(B|\{B,C,D\})}{P(J|\{B,C,D\})} < \frac{P(B|\{A,B,C,D\})}{P(J|\{A,B,C,D\})}, J = \{C,D\}$). Therefore, it can be concluded that for market exit a negative attraction effect also exists; hypothesis 2 is partially confirmed.

The store brand D could also attract some of the previous customers of brand A. However, this increase in market share is smaller than anticipated by *IIA* ($\chi^2 = 1.439,\ d.f. = 1,\ sig. = 0.230$).

2.5.1.4 Discussion

These results can be used to summarize the impacts on both manufacturers and retailers. The food manufacturer of brands A and B loses a remarkable portion of its customers (-18.31 percent) because many respondents decided to switch brands rather than sub-brands. In the second choice scenario, only 8.57 percent of previous buyers of brand A selected brand B (from the same food company), indicating loyalty to the company. In order to evaluate the impacts on retailer's return further information on realized margins would be needed. However, we can conclude that sales are not so highly affected since nearly all subjects decided in favor of substitution rather than switching stores. In addition, the store brand D could attract some of the previous customers of the removed brand; hence, private-label range is augmented. In the studied example, the competitor brand (C) benefits most from the removal of brand A. It adopted the major portion of recent buyers of brand A and also kept its own customers. Summing up, both retailers and manufacturers should pay heed to the competition environment and employ consolidated findings on context effects when deciding

and negotiating on the deletion of product offerings. By dint of the presented study, we succeeded in providing evidence of the existence of two major *negative context effects* for brand exit. However, the third hypothesis on a *negative compromise effect* cannot be tested by means of the discussed experiment, since none of the included brands was considered a "compromise" option. Therefore, the results of a second experiment are presented hereafter.

2.5.2 Study 2

The aim of the second survey is to analyze brand choice for MP3 players (which differed on two attributes, memory in GB and battery in hours) and the effects of a hypothetical removal on shifts in choice shares. Subsequently, we only consider one part of the survey covering the compromise effect and present the major results. For our analysis we kept 260 respondents who showed the demanded familiarity with the product in order to measure preference. A pretest-posttest design was employed to consider customers' reactions on unavailability. Constructed experimental choice scenarios consist of different three-brand choice sets including a compromise option (T) (see Figure 2.3, comparable to Figure 2.1.3) and reduced two-brand choice sets (an example of the choice set manipulation is presented below).

	Set 1			**Set 2**	
Attribute	**C**	**T**	**E**	**C**	**T**
Memory (in GB)	1	2	4	1	2
Battery (in hours)	9	6	3	9	6

Figure 2.3: Choice Set Manipulation (Example, Study 2)

To test whether a *negative compromise effect* can be detected, we compare choice shares predicted by *IIA* with actual choices (within-subjects) on an aggregated level. If *IIA* holds,

market shares of C and T should rise proportionately if alternative E disappears. Table 2.4 displays selected results.

	MS_1	MS_2	*Context-dependent* $\Delta MS_{observed}$	*Classical Theory* ΔMS_{IIA}	*Difference*
C (1GB, 2h)	12.31%	16.92%	**+4.62%**[ns]	+1.43%	+3.19%
T (2GB, 6h)	77.31%	83.08%	**+5.77%**[ns]	+8.96%	-3.19%

[ns] deviation not significant, $p>0.05$

Table 2.4: Shifts in Choice Shares (Study 2)

Comparing the computed expected market share with the observed shares, we can conclude that the previous "compromise" alternative T is selected less often than predicted by *IIA*. Since T loses its intermediate position, it is perceived less attractive. The increase in market share is, however, not significantly lower ($\chi^2=2.238,\ d.f.=1,\ sig.=0.135$). Accordingly, hypothesis 3 is only partially supported. Nevertheless, the finding empirically documents the relevancy of context theory to explain preference shifts when an extreme alternative is removed from the market and choice set respectively.

Negative context effect	**Hypothesis**		**Support**	
Negative similarity effect	H1	$\frac{P(C\|\{T,C\})}{P(T\|\{T,C\})} > \frac{P(C\|\{T,C,S\})}{P(T\|\{T,C,S\})}$	Study 1	✓
Negative attraction effect	H2	$\frac{P(T\|\{T,C\})}{P(C\|\{T,C\})} < \frac{P(T\|\{T,C,D\})}{P(C\|\{T,C,D\})}$	Study 1	✓
Negative compromise effect	H3	$\frac{P(T\|\{T,C\})}{P(C\|\{T,C\})} < \frac{P(T\|\{T,C,E\})}{P(C\|\{T,C,E\})}$	Study 2	(✓)

Table 2.5: Summary of Results on Negative Context Effects

Summing up, support for H1, H2 and H3 indicates that the three major context effects, so far verified for market entry, emerge also when items are removed from the market. By considering a real-life example, our results make context effects and negative context effects more relevant to managers. They should take these effects into account when deciding on the reduction of their assortments and brand portfolios, respectively. The provided evidence of the existence of negative context effects demonstrates that eliminating "dominated", "similar" or "extreme" options affects the market share of the remaining brands in a theoretically predictable way.

2.5.3 Determinants of Customers' Reactions

In a third step, it is of major interest to detect factors that influence customers' decisions when their preferred brand is removed from the shelf. Identifying the key determinants of reactions in delisting situations can provide valuable insights for management. Which antecedents ascertain whether customers either act brand loyal or decide to switch brands? Which variables result in a higher probability to act brand loyal?

To answer these questions, we used data from study 1, kept all respondents representing previous buyers of brand A ($n_A=57$) and analyzed their behavior in the second choice setting. The research design is given by Figure 2.4. We are interested in finding an appropriate combination of predictor variables to help explain the binary outcome. The structure of the model can be explained as in Figure 2.4 and will be explained in detail in the next paragraph. A binary logistic regression is applied. Maximum likelihood estimation is employed to estimate the parameters and to get the indicators for significance testing.

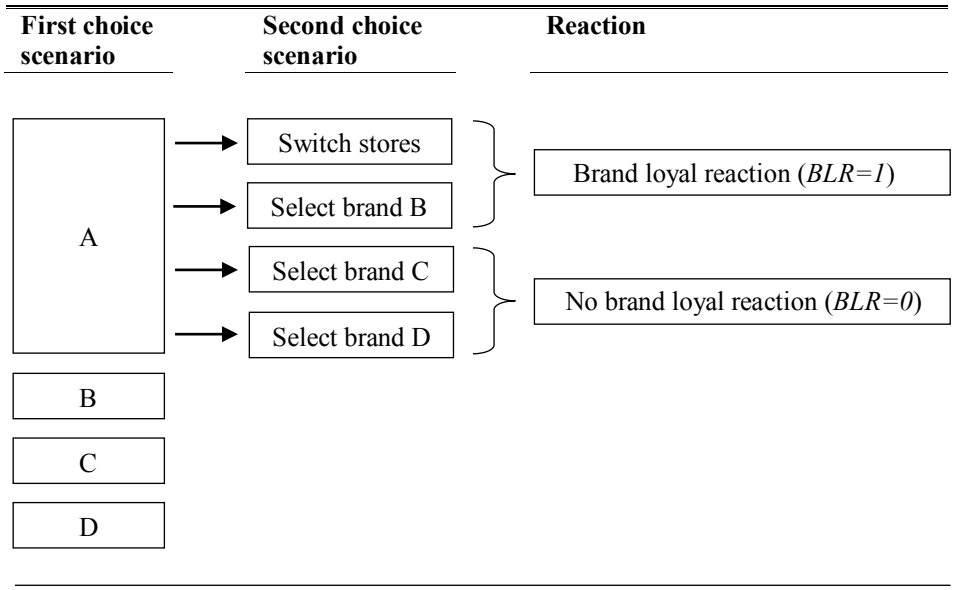

Figure 2.4: Framework for Classifying Respondents in Terms of Brand Loyalty of their Reaction

2.5.3.1 Dependent Variable of the Model

In the survey (see 2.5.1), we measured hypothetical choice before and after delisting. The binary dependent variable ("*brand loyal reaction (BLR)*" with *{1, 0} = {"yes", "no"}*) is composed of respondents' initial brand choice (A) and their switching behavior. If participants chose to switch to brand B (same-manufacturer brand) or decided to switch stores, their reaction is classified *brand loyal* (*BLR=1*). Switching to brand C or brand D is assigned to a *no brand loyal reaction* (*BLR=0*) (see Figure 2.4). Table 2.6 reports the descriptive results.

Reaction	Frequency	n	Dependent Variable
Switch to brand B	21	22	brand loyal reaction (*BLR=1*)
Switch stores	1		
Switch to brand C	23	35	no brand loyal reaction (*BLR=0*)
Switch to brand D	12		

Table 2.6: Frequency Distribution of Customer Reactions when their Preferred Brand is Delisted

The objective of the subsequent logistic regression is to discover the specific characteristics of both groups of respondents and to specify the differences between the two segments. The determinants contained in the model are described in the subsequent paragraph.

2.5.3.2 Independent Variables of the Model

We included a set of predictors and a set of control variables in the model to explain the brand loyal reaction. We assume that *BLR* is affected by (1) attitudinal variables, (2) choice set related factors and (3) sociodemographic characteristics (control variables). Attitudinal variables cover positive or negative judgments about different eating habits (*"Addiction to fast food", "Importance of the pizza base", "Importance of variety")* as well as customer specific views of general shopping habits (*"Preference of buying branded products"*, *"Preference of buying high-quality products"*). Choice set related variables pertain to variables that are linked to the composition of available alternatives, such as *"Consideration set size"* and *"Preference strength of buying products from the same manufacturer"* (maker of A and B). The latter is obtained by adding up the points for the preferred brand A and for B provided by the preference ratings on a constant sum scale in the first choice scenario divided by 100.[7] The included sociodemographics that might influence the reaction on delisting

[7] The instruction for the constant sum scale task was: "Based on your preference, please distribute 100 points among the brands, giving most points to the brand you prefer most. Make sure the points add up to 100." (Hauser and Shugan, 1980)

consist of *"Age of the respondent"* and *"Sex of the respondent"*. Table 2.7 summarizes the considered consumer and choice set related factors. The third column indicates the predicted direction of the determinants' effects on the brand loyal reaction chosen by the respondents (*BLR=1* or *BLR=0*). An increase (or a reduction) in the likelihood of reacting in a brand loyal way is specified by a "+" (or a "-"). For instance, *"Preference of buying branded products"* implies a very brand-conscious behavior, making a brand loyal reaction more likely (presented by a "+" in column three of Table 2.7). The illustrated hypotheses are derived in the following way:

Hypothesis 4 states that *"Addiction to fast food"* is likely to decrease a brand loyal reaction. If people frequently consume fast food, they are probably habituated to different brands within different product categories. That is why they might switch brands when faced with a delisting (H4: -). Greater *"Importance of variety"* may be associated with a higher probability of a brand loyal response in the case of a manufacturer that offers a huge mixture in its product-line. As the examined company provides reasonable diversity, we expect a positive coefficient (H5: +). If participants consider the pizza base very important, it is assumed that the base is the selection criterion of major significance. Consequently, after the removal of brand A, a pizza with a broadly similar base will be chosen with increasing frequency. In our example case, B (the same-manufacturer brand) possesses a very different type of base. Therefore, we predict that subjects who attach a lot of importance to the pizza base will be more likely to select C or D in the second choice setting (H6: -). A higher *"Preference of buying branded products"* may obviously be related to a higher chance of a brand loyal behavior (H7: +). If customers prefer buying high-quality products, a brand loyal answer is in turn less likely provided that further brands of high quality are available (H8: -). Moreover, choice set related variables might influence the reaction significantly. We include the predictor *"Consideration set size"* into our model and suggest that a smaller consideration

set will induce a notably higher likelihood of a brand loyal reaction (H9: +). This predictor is measured by counting respondents' reported brands of frozen pizza with which they are acquainted. In addition, a stronger *"Preference strength of buying products from the same manufacturer"* is obviously linked to a higher probability of a brand loyal reaction (H10: +). With regard to sociodemographics, a significant influence is presumed for respondents' age and gender. Firstly, elderly people do usually have a favorite brand and are not fond of trying new brands. This is restated in our eleventh hypothesis (H11: +). Secondly, the categorical variable *"Sex of the respondent"* could affect the reaction. Typically, women are responsible for grocery shopping; hence, they are more familiar with grocery brands which often result in a distinctive preference for specific brands (H12: -).

Determinant	**Variable**	**Hypothesis: effect of determinant on BLR**	
attitudinal variables			
"Addiction to fast food"	FAST_FOOD	H4:	-
"Importance of variety"	IMP_VAR	H5:	+
"Importance of the pizza base"	IMP_BASE	H6:	-
"Preference of buying branded products"	PREF_BRANDS	H7:	+
"Preference of buying high-quality"	PREF_QUALITY	H8:	-
choice set related variables			
"Consideration set size"	SIZE_CS	H9:	-
"Preference strength of buying products from the same manufacturer"	PREF_A_B	H10:	+
sociodemographics			
"Age of the respondent"	AGE	H11:	+
"Sex of the respondent"	SEX (1-female, 2-male)	H12:	-

Table 2.7: Hypotheses on the Impact of Consumer and Choice Set Related Factors

The measurement models of the multiple-item concepts and the measures of the single-item scales are presented in Appendix 2.1.

2.5.3.3 The Model

To test the derived hypotheses (H4 to H12), we estimate a binary logit model explaining the choice probability of a brand loyal reaction as a function of the discussed consumer and choice set related factors. In our study, a participant can either select a brand loyal reaction (*BLR=1*) or a non-brand loyal reaction (*BLR=0*). The goal of binary logistic regression is to correctly predict the category of outcome (*BLR=1* and *BLR=0*, respectively) for individual cases using the most parsimonious model. Parameter estimates are recovered that most suitably predict the probability of both outcomes:

$$\pi_k(BLR_k) = \begin{cases} \left(\dfrac{1}{1+\exp\left[-\left(\alpha + \sum_{j=1}^{J} \beta_j x_{jk}\right)\right]} \right) & for\ BLR_k = 1 \\ \left(1 - \dfrac{1}{1+\exp\left[-\left(\alpha + \sum_{j=1}^{J} \beta_j x_{jk}\right)\right]} \right) & for\ BLR_k = 0 \end{cases} \qquad (1)$$

Then the logistic regression model for the log odds of a brand loyal reaction is

$$\ln\left[\frac{\pi_k(BLR_k = 1)}{1-\pi_k(BLR_k = 1)}\right] = \alpha + \sum_{j=1}^{J} \beta_j x_{jk} \ . \qquad (2)$$

Where: $\pi_k(BLR)$ = probability that respondent *k* chooses the brand loyal reaction (if $BLR_k=1$) and probability that respondent *k* chooses the non-brand loyal reaction (if $BLR_k=0$), respectively; α = intercept; x_{jk} = consumer or choice set related characteristic *j*, as perceived

by consumer k; β_j= coefficient for variable j; J = Set of consumer or choice set related characteristics expected to affect the way of reaction and

$$\alpha + \sum_{j=1}^{J} \beta_j x_{jk} = \alpha + \beta_1 \cdot FAST\_FOOD_k + \beta_2 \cdot IMP\_BASE_k + \beta_3 \cdot IMP\_VAR_k + \beta_4 \cdot PREF\_BRANDS_k + \beta_5 \cdot PREF\_QUAL_k + \beta_6 \cdot SIZE\_CS_k + \beta_7 \cdot PREF\_A\_B_k + \beta_8 \cdot AGE_k + \beta_9 \cdot SEX_k \quad (3)$$

Estimation proceeds by finding parameter estimate betas that maximize the resulting likelihood function. For given values of x_j the expected probability for any respondent k to belong to the brand loyal segment $BLR=1$ is given by

$$\pi_k(BLR = 1) = \frac{\exp(\alpha + \sum_{j=1}^{J} \beta_j x_{jk})}{1 + \exp(\alpha + \sum_{j=1}^{J} \beta_j x_{jk})} \quad . \qquad (4)$$

We employ the software package SAS 9.2, the maximum-likelihood algorithm and the iterative Fisher's scoring method to estimate the regression parameters.

2.5.3.4 Results

Prior to estimating the binary logit model, we checked whether multicollinearity might cause methodological problems. The correlation matrix illustrates very low correlation coefficients between the independent variables (see Appendix 2.2). Therefore, the condition of independency is satisfied and the estimators will not be affected significantly (Leeflang et al., 2000). The results of the estimated binary logit models are presented in Table 2.8. We estimated the different models stepwise in order to reveal potential moderating effects of choice set or demographic variables. By comparing the results, an underlying cause of the

control variables can be excluded (see Table 2.8). Accordingly, the subsequent interpretation and discussion of the estimation outcomes is focused on the most exhaustive model 3. The model's χ^2 statistic is 28.064 (with *d.f.=9, p=0.001*). Hence, we can conclude that at least one of the betas in equation (6) is nonzero. The computed goodness-of-fit measures indicate an adequate fit of the statistical model.

	Model 1			***Model 2***			***Model 3***		
	χ^2=14.0556 (df=5, p=0.015)			*χ^2=21.5977 (df=7, p=0.003)*			*χ^2=28.064 (df=9, p=0.001)*		
Parameter	Coefficient (std.error)	Wald	Odds Ratio	Coefficient (std.error)	Wald	Odds Ratio	Coefficient (std.error)	Wald	Odds Ratio
Intercept	0.8624 (1.5819)	0.2972		-4.5013 (2.7440)	2.6908		-10.6485 (4.7509)	50.237	
FAST_FOOD	-0.6530* (0.3565)	3.3560	0.520	-0.6446* (0.3822)	2.8452	0.525	-0.2823 (0.3988)	0.5013	0.754
IMP_VAR	0.3288 (0.2170)	2.2960	1.389	0.3274 (0.2347)	1.9452	1.387	0.4444* (0.2675)	27.597	1.560
IMP_BASE	-0.3869* (0.2100)	3.3941	0.679	-0.4624* (0.2641)	3.0649	0.630	-0.6625** (0.3119)	45.129	0.516
PREF_BRANDS	0.3259 (0.3108)	1.0995	1.385	0.5717 (0.3589)	2.5371	1.771	0.5050 (0.3941)	16.416	1.657
PREF_QUAL	-0.4878 (0.3039)	2.5767	0.614	-0.9023** (0.4039)	4.9913	0.406	-1.2656** (0.5120)	61.098	0.282
SIZE_CS				0.5506 (0.3912)	1.9812	1.734	0.9473* (0.5021)	35.596	2.579
PREF_A_B				7.0157** (3.1521)	4.9537	>999.9	7.9481*** (3.5584)	49.889	>999.9
AGE							0.2185* (0.1235)	31.296	1.244
SEX							0.4883 (0.9802)	0.2482	1.630
Model Fit									
-2 Log likelihood		61.972			54.430			47.963	
AIC		73.972			70.430			67.963	
SC		86.230			86.774			88.394	
Nagelkerke-R^2		0.2967			0.4282			0.5279	
Cox & Snell-R^2		0.2185			0.3154			0.3888	
Hosmer-Lemeshow Goodness-of-Fit Test	4.7451 (*df=8, p=0.7844*)			182.237 (*df=8, p=0.0196*)			40.283 (*df=8, p=0.8546*)		

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

Table 2.8: Results of Binary Logistic Regression

We find some of the expected effects, some hypotheses are rejected and some predictors turned out not to be significant. Participants' *"Addiction to fast food"* revealed no significant effect (no support of H4). In contrast, the *"Importance of variety"* offered by a frozen food manufacturer has a significant effect. The impact on participant's probability to react in a brand loyal way is positive if he favors variety, consistent with hypothesis 5. If companies offer a diversified portfolio, it might be easier to switch to another kind of pizza by sticking to the same manufacturer. Thus, food companies facing the threat of being delisted should sell other sub-brands at the same store to keep customers. Moreover, customers who perceive the pizza base to be very important will be less likely to select the brand loyal reaction (*BLR=1*). This is in line with hypothesis 6. If their favorite brand is not available, they will select a pizza with a comparable base. In the studied example, the additional pizza of the same manufacturer (B) does not represent an acceptable option, since the type of base differs a lot. The predictor *"Preference of buying branded products"* has no significant effect on the probability of a brand loyal response; therefore hypothesis 7 is not confirmed. In contrast, the negative coefficient of the predictor variable *"Preference of buying high-quality products"* coincides with the assumption that customers who are especially aware of high-quality products do not hesitate to switch brands if both provide high quality. While hypothesis 8 is supported, hypothesis 9 is rejected. The positive parameter of the predictor *"Consideration set size"* indicates an increase in the probability of the brand loyal outcome (*BLR=1*) when respondents have larger consideration sets. A possible explanation for this result might be that participants who are acquainted with more brands of frozen pizzas are normally more familiar with the product category and accordingly, appreciate most the manufacturer brand. Additionally, hypothesis 10 is corroborated. The "*Preference of buying a product from the same manufacturer"* significantly influences the binary outcome of *BLR*. As expected, a higher preference for A and B augments the chance of being brand loyal after the removal of

A. Another significant explanatory variable is the *"Age of the respondent"*. The outcome reflects the prevalent opinion that, in general, brand loyalty is higher for elderly people because they are more likely to have one favorite brand. In addition, older people experiment less with new brands. Finally, the effect of *"Sex of the respondent"* is not significant, implying no confirmation of hypothesis 12. Table 2.9 combines the discussed findings.

Determinant	Variable	Hypothesized effect	Result binary model
	attitudinal variables		
"Addiction to fast food"	FAST_FOOD	H4: -	n.s.
"Importance of the variety"	IMP_VAR	H5: +	✓
"Importance of the pizza base"	IMP_BASE	H6: -	✓
"Preference of buying branded products"	PREF_BRANDS	H7: +	n.s.
"Preference of buying high-quality"	PREF_QUALITY	H8: -	✓
	choice set related variables		
"Consideration set size"	SIZE_CS	H9: -	✗
"Preference of buying a product from the same manufacturer."	PREF_A_B	H10: +	✓
	sociodemographics		
"Age of the respondent"	AGE	H11: +	✓
"Sex of the respondent"	SEX	H12: -	n.s.

Table 2.9: Summary of Hypotheses and Results

2.6 Discussion and Implications

The purpose of this paper is to investigate how customers react when restrictions are imposed on product offerings. The first part of the study proves that the widely discussed context effects for an expansion of the choice set are also present in situations when the expected product offering is reduced. In particular, the meaningful impact of unavailable options on preferences and consequently choice is shown. Rational principles of choice are violated. The paper provides evidence that removing "dominated", "similar" or "extreme" alternatives from

the shelf impacts choice shares of the remaining brands in a theory-based predictable way. The results of study 1 illustrate that delisting can harm the manufacturer and indicate the influence of context on customers' reactions. Most of the customers (39 percent) of the delisted brand A switch to the main competitor brand C in the second choice situation. The concerned food company can only keep a smaller part of the previous customers of brand A (35 percent). In contrast, the retailer faces a negligible loss of customers in our sample; store switching is only selected by two respondents. This delivers valuable input for retailer-manufacturer negotiations. They have to incorporate the specific positions of the involved products when negotiating prices and shelf spaces. Indeed, we have managed to verify three substantial context effects for choice set reduction, the *negative* substitution effect, the *negative* attraction effect and the *negative* compromise effect, which makes context theory more important for managers. Our findings contribute to marketing literature on context effects by empirically documenting the impact of choice set reduction on preference shifts. In fact, context matters when a brand is delisted.

The second part of the empirical application detects important characteristics of brand loyal customers. The influence of some key determinants on subjects' reaction is studied by employing a logistic regression. The utilization of this type of model is determined by the nature of the dichotomous dependent variable, describing a brand loyal vs. a non-brand loyal reaction. Results suggest that both consumer and choice set related determinants significantly affect customer reaction. Elderly respondents with a larger consideration set who prefer variety and buying brands from the same manufacturer but do not consider the pizza base to be important exhibit a higher probability of a brand loyal reaction. Taking into account the initial competition, these predictors may have an influence on the magnitude of the *negative* attraction effect. Since the same-manufacturer brand B is perceived slightly superior to A on the included dimensions, the reaction classified as brand loyal decreases the proposed

negative attraction effect. The presented results reveal important determinants of a brand loyal reaction that should be considered by multi-brand companies when deciding on or negotiating about the removal of brands.

A major limitation of our research is that the results are based only on reported delisting responses and attitudinal data. Despite the fact that data collection by means of a questionnaire can be criticized in different ways, a substantial advantage of questionnaires over real choices represents the possibility to differentiate clearly between the potential reactions. In addition, surveys allow collecting supplementary information which can be utilized to explain stated behavior. In our study, respondents face a hypothetical delisting situation which shows that people do not always act in the same way they pretend they would. Sometimes, subjects have difficulties to imagine a situation such as the one with which they were confronted, which altogether may lower the external validity. However, the questionnaire allows us to collect relevant information necessary to address the specific research objective and there is broad support in the literature that hypothetical and real choices can lead to the same results (Kühberger et al., 2002; Wiseman and Levin, 1996). Furthermore, the hypotheses in the first part of the study are tested by means of aggregated data. The boundaries of our research generate opportunities for future research. The analysis covers only two product categories, particularly; choice in both experiments was limited to four and three alternatives, respectively. Further research has to generalize the findings by examining more categories in a real-world shopping situation. Scanner panel data across stores could enable the development of a tool to determine consequences and practical implications for manufacturers and retailers prior to brand delistings. Developing effective strategies to manage dissatisfaction due to delistings would be another useful and interesting area to be explored. For instance, is suggesting an available alternative a positive or negative approach? Should retailers communicate that a brand is going to be delisted? Should they

offer an equivalent store brand? Besides this operational objective, additional moderators should be included when analyzing the outcome of an entire delisting strategy. A causal model can be used to cover complex relationships between major antecedents and constructs.

Overall, the results of the study demonstrate that consumer preferences and responses to delisting are strongly influenced by the composition and framing of the choice set. Retailers and manufacturers should derive advantages from insights on context theory when deciding on items to delist.

Appendix 2.1: Measurement Models of Multi-Item Concepts and Measures of the Single-Item scales

Determinant	Variable	Concept	Measure
		attitudinal variables	
multi-item scale			
Addiction to fast food	FAST_FOOD (Cronbach's α = 0.71)		
		"I often eat fast-food."	1-I totally disagree, 5-I totally agree
		"I prefer to cook dishes that do not take much time."	1-I totally disagree, 5-I totally agree
		"I often eat out."	1-I totally disagree, 5-I totally agree
		"At home we often cook our own food." *	1-I totally disagree, 5-I totally agree
single-item scales			
Importance of the variety	IMP_VAR	"When buying frozen pizza, how important do you consider a great variety of pizza?"	1-not at all important, 7-very important
Importance of the pizza base	IMP_BASE	"When buying frozen pizza, how important do you consider the pizza base?"	1-not at all important, 7-very important
Preference of buying branded products	PREF_BRANDS	"Groceries from well-known brands are better than those from unknown brands."	1-I totally disagree, 5-I totally agree
Preference of buying high-quality products	PREF_QUALITY	"When buying groceries, I especially take heed of quality."	1-I totally disagree, 5-I totally agree
		choice set related variables	
Consideration set size	SIZE_CS	Number of named brands (consideration set)	"Please name all the brands of pizza that you are acquainted with."
Preference Strength of buying products from the same manufacturer	PREF_A_B	Points for the preferred brand A and brand B are added up provided by the preference ratings on a constant sum scale in the first choice scenario divided by 100.	"Based on your preference, please distribute 100 points among the brands, giving most points to the brand you prefer most. Make sure the points add up to 100."
		sociodemographics	
Age of the respondent	AGE	Age of the respondent	in years
Sex of the respondent	SEX	Sex of the respondent	1-female, 2-male

* Scores of statements that measure the opposite of the indicated characteristics were recoded.

Appendix 2.2: Correlation Matrix

	FAST_FOOD	IMP_VAR	IMP_BASE	PREF_BRANDS	PREF_QUALITY	SIZE_CS	PREF_A_B	AGE	SEX
FAST_FOOD	1								
IMP_VAR	-0.116	1							
IMP_BASE	-0.099	0.024	1						
PREF_BRANDS	0.008	0.230	-0.119	1					
PREF_QUALITY	-0.098	0.114	0.171	0.139	1				
SIZE_CS	-0.119	-0.055	0.243	-0.153	-0.001	1			
PREF_A_B	-0.136	0.204	-0.158	-0.025	0.302	-0.015	1		
AGE	-0.379	0.142	0.182	0.195	0.151	-0.119	0.119	1	
SEX	0.126	-0.086	-0.202	0.129	0.242	-0.079	-0.008	0.178	1

3 EXPLAINING CUSTOMERS' SWITCHING PATTERNS TO BRAND DELISTING

Wiebach and Hildebrandt (2011)

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ABSTRACT

Delisting is frequently used by retailers to strengthen their negotiating position against manufacturers. However, both parties have to consider the risk of potential reactions when customers are faced with a reduced or modified assortment and thus, different choice. This research investigates customers' switching behavior if a brand is delisted by taking into account context theory. The results of two real-life quasi-experiments reveal that customer responses depend significantly on the context and that manufacturers may encounter substantially larger losses than retailers. Two further online experiments support the hypotheses on the existence of *negative* context effects for brand removals. Managerial implications can be derived and recommendations for further research are developed.

3.1 Introduction

Delisting, defined as the permanent deletion of a brand from the assortment of a retailer (Sloot and Verhoef, 2008), is a prevalent instrument in today's retailing practice. Retailers' reasons for delisting brands are the need for free shelf space to sell private labels, cost-saving programs to stay competitive, alleviating shopper confusion and the attempt to strengthen their negotiating power against manufacturers. The latter is especially important. Brand manufacturers mainly depend on retailers to sell their products. Hence, a delisting can induce declines in sales as customers are forced to switch brands if they want to stay loyal to the store. In addition, operational costs ascending with rising stock keeping units (SKUs), inventory costs and out-of-stock levels are lower. Reducing these costs helps conventional supermarkets compete against the growing retail formats of discount stores. However, assortment reductions can also cause losses for retailers if brand loyal customers do not switch to another brand on the shelf but to competing stores when the preferred item is no longer sold. As delisting bears risks for both parties, it is of great relevance to investigate its implications, to predict choice modification and to measure the evoked changes in the competitive environment. Despite its great managerial importance, delisting as one type of unavailability of items has been widely neglected in the literature. By contrast, short-term unavailability, referred to as out-of-stock, has gained more attention (Breugelmans et al., 2006; Campo et al., 2000; Emmelhainz et al., 1991; Peckham, 1963).

Removing brands permanently from the shelf alters the decision context of customers and thus, has an influence both on their brand choice behavior and store choice. Experimental research, predominantly directed to market entry, has revealed that changes in the set of alternatives can induce systematic shifts in choice probabilities (Huber et al., 1982). It is

claimed that decision-making is highly influenced by a changed context[8]. Extensive experimental evidence from context effects research indicates that the introduction of a new alternative can cause significant changes in brand choice behavior (Huber et al., 1982; Dhar and Glazer, 1996; Pan and Lehmann, 1993; Tversky, 1972). In contrast, our research addresses the question of whether a similar effect can be observed for brand removals. More precisely, the current study takes into account context theory when investigating preference changes and brand choice behavior in response to delisting strategies.

Thus, this paper contributes to marketing and retailing literature by relating context theory to customers' reactions on delisting decisions and exploring the consequences. Our findings extend the work of Sivakumar and Cherian (1995) by demonstrating the existence and strength of three *negative* context effects in the case of brand removals. In addition, this research provides knowledge that facilitates retailers' decision-making when considering downsizing the assortment. An improved understanding of theoretically predictable customer responses to reduced product offerings may help retail managers to enhance buying conditions in negotiations with manufacturers. Insights on the severity of a threat to delist are of great value to brand manufacturers. Finally, recommendations for product portfolio decisions can be derived.

The article is organized as follows: Prior research on permanent assortment reductions is reviewed in the next section. Then, the theoretical background on context-dependent preferences is briefly presented, our research objectives are specified and hypotheses are developed. In section 4, four empirical studies examine the shifts in choice probabilities when brands are removed. We conclude with a discussion of our key findings and an outlook on future research.

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[8] Consistent with prior research, the term context is defined as the set of alternatives under consideration (Tversky and Simonson, 1993).

3.2 Theoretical Background

3.2.1 Permanent Assortment Unavailability

In marketing literature, studies on permanent assortment reductions (PAR), i.e. a considerable percentage of items in a category is eliminated by the retailer, have concentrated on permanent item deletion and its consequences for category and store sales as well as assortment perception (Boatwright and Nunes, 2001; Borle et al., 2005; Broniarczyk et al., 1998). It has been commonly assumed that more choice is better (Oppewal and Koelemeijer, 2005). This postulation has been confirmed by various store choice studies (Hoch et al., 1999; Steenkamp and Wedel, 1991) and has been adopted by retailers. Larger assortments are supposed to attract more customers, as they are thought to better meet the customer's needs along with varying preferences (Bettman et al., 1998) and reduce time and transportation costs associated with a one-stop shopping (Messinger and Narasimhan, 1997). A large assortment offers flexibility for variety seekers and increases the probability to get one's favored alternative. Recent research, however, has called this "more choice is better" belief into question and has revealed that sales can actually go up when items are removed from the assortment and do not affect store choice (Boatwright and Nunes, 2001). Broniarczyk et al. (1998) found that smaller assortments may be perceived as being more attractive as long as they include the preferred items and category space is held constant. Similarly, the "paradox of choice" was shown by Schwartz (2004). It implies that a too large assortment can overstrain the consumer's mind and increase choice difficulty on a typical grocery shopping trip. The information overload may result in consumer confusion and lower satisfaction with the decision process (Iyengar and Lepper, 2000). This is consistent with the work of Gourville and Soman (2005), who discovered that increasingly large assortments ("overchoice") can

have a negative impact on consumer choice and brand share. They claim that this effect is significantly moderated by assortment type. Chernev (2003) further demonstrated in four experiments that the selections made from larger assortments can result in weaker preferences due to the identified key factor ideal point availability. The same was shown by Zhang and Krishna (2007) who examined brand-level effects of SKU reductions and found varying outcomes across brands, categories and customers. In general, the ongoing discussion about the phenomenon is referred to as the "choice overload hypothesis."

By contrast, delisting and its impact on customer reactions have been covered by Sloot and Verhoef (2008). In their study, the behavioral consequences of a (primary) brand delisting are examined by means of store switching intention (SSI) and brand switching intention (BSI) in sixteen different stores and ten product categories taking into account different antecedents. Their study provides evidence that many consumers stay brand loyal and that only a small proportion cancels their purchase if the favored brand becomes unavailable. Additionally, they found that delisting, in particular of high market share brands in hedonic product groups, has a negative impact on category sales and store choice.

Previous research on permanent unavailability has primarily identified empirical associations. An appropriate theory to explain customer behavior in such situations has not been adopted. We claim that context theory will help to account for customer reactions when confronted with reduced choice.

3.2.2 A Context-Theoretical Explanation of Preference Shifts due to Assortment Changes

In contrast to classical economic theory, which assumes fixed preferences and utility maximization, research on context effects states that consumers often do not have well-defined preferences and construct choice at the time a decision is made (Bettman, 1979; Bettman and Park, 1980; Payne et al., 1992; Slovic, 1995; Tversky et al., 1988). Choices are

dependent on the positions and the presence or absence of other alternatives, referred to as the specific set of alternatives in which an option is considered (Bhargava et al., 2000; Huber et al., 1982; Simonson, 1989). As a result, the value of an option does not only depend on its own characteristics but also on the attribute levels of the other options in the choice set (Hildebrandt and Kalweit, 2008; Simonson and Tversky, 1992). Consequently, context effects represent a violation of some essential criteria of rational decision behavior (e.g., the principle of regularity, the independence from irrelevant alternatives *(IIA)* assumption (Luce, 1959)).

The most robust phenomena, observed in experiments on market entry and measured by means of preference or choice data, are the *similarity effect* (Tversky, 1972), the *attraction effect* (Huber et al., 1982) and the *compromise effect* (Simonson, 1989) which are visualized in Figure 3.1.

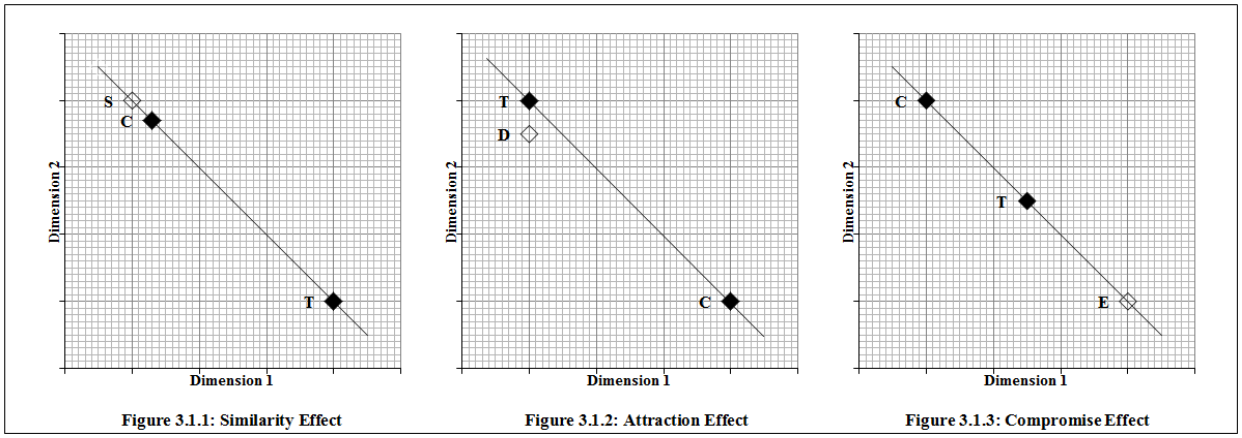


Figure 3.1: Similarity Effect, Attraction Effect and Compromise Effect.

The experimental setting applied by most context effects researchers comprises of an initial choice set with two options, *T* (=target) and *C* (=competitor), which differ on two equally important dimensions (e.g., price and quality) and lie on the same trade-off line such that

$P(T|\{T,C\}) \approx P(C|\{T,C\})$.[9] If subsequently an option *S* (similar to *C*) is added to the choice set (see Figure 3.1.1), the *similarity effect* can be observed. According to this effect, the introduced alternative *S* takes disproportionately more choice shares away from similar than from dissimilar alternatives. Due to the addition of *S* to the choice set, *S* and *C* are perceived as exchangeable options and constitute one cluster in the consumer's mind (categorization process) (Cohen and Basu, 1987; Tversky, 1977). The loyalty of a potential buyer is divided by the similar items (Huber and Puto, 1983). By contrast, the perceived distance with regard to the dissimilar option *T* is increased (Parducci, 1965). Consequently, the relative choice shares change in favor of the target alternative *T* when *S* is introduced. This choice behavior results in a violation of the *IIA* assumption, since $\frac{P(T|\{T,C,S\})}{P(C|\{T,C,S\})} > \frac{P(T|\{T,C\})}{P(C|\{T,C\})}$. The *attraction effect* (Huber and Puto, 1983) denotes the situation when the introduction of an asymmetrically dominated decoy (*D*) increases the choice probability of the dominating target (*T*) (see Figure 3.1.2). One argument to explain the induced shift in choice share is the facilitation of choice strategies by the use of dominance heuristics. Choosing the dominating alternative avoids having to make difficult trade-offs (Wedell, 1991) and simplifies the justification of the decision (Simonson, 1989). Further substantiated explanations are loss aversion, range-frequency theory (Parducci, 1974) and context-dependent weighting of dimensions (Tversky et al., 1988). The attraction effect violates the fundamental *IIA* assumption, since *D* alters the *T*-to-*C* preference ratio as follows: $\frac{P(T|\{T,C,D\})}{P(C|\{T,C,D\})} > \frac{P(T|\{T,C\})}{P(C|\{T,C\})}$. In addition, the regularity principle of choice behavior may be violated if $P(T|\{T,C\}) < P(T|\{T,C,D\})$. The *compromise effect* (Simonson, 1989) depicts the phenomenon that the relative preference of the alternative *T* is enhanced by the

[9] The notation *P(T|{T,C})* denotes the probability of choosing option T from the set of options *{T,C}*.

entry of an extreme option *E* (see Figure 3.1.3). Option T is turned into a compromise option and hence, its probability of choice is augmented. Choosing a middle option is perceived as easier to justify and less likely to be criticized (Simonson, 1989) and results in a violation of the *IIA* assumption: $\frac{P(T|\{T,C,E\})}{P(C|\{T,C,E\})} > \frac{P(T|\{T,C\})}{P(C|\{T,C\})}$.

3.3 Hypotheses

We use the results of previous research on context-dependent preferences for market entry to develop a system of hypotheses for market exit, especially on the *negative similarity effect*, the *negative attraction effect* and the *negative compromise effect*. We use an inverse formulation for the estimation of choice probabilities. Thereby, the violation of the proportionality hypothesis (*IIA*) underlying classical economic theory is used as an indicator for the existence of context effects (Huber and Puto, 1983; Mishra et al., 1993).

Traditional utility theory and choice modeling would predict choice shares[10] as follows: If an alternative (A) is deleted from the choice set, the *IIA* assumption implies a proportional distribution on the remaining brands (B, C, …, N) (Luce, 1959), i.e.

$$MS_{i,2}^{IIA} = \frac{MS_{i,1}}{\sum_{i=B,i\neq A}^{N} MS_{i,1}} \cdot MS_{A,1} + MS_{i,1}$$

with

$MS_{i,2}^{IIA}$: market (choice) share of the remaining brand i (i={B, C, …, N}) after delisting,

[10] If we assume that the research sample is representative of the market, the choice share would be identical with the market share we utilize in the abbreviation of market share (*MS*).

$MS_{i,1}$: market (choice) share of brand i (i={B, C, …, N}) before delisting,

$MS_{A,1}$: market (choice) share of the delisted brand A before delisting.

If the observed market share deviates significantly from the predicted market share $MS_{i,2}^{IIA}$, we conclude that *negative* context effects exist. Subsequently, hypotheses on the three phenomena are developed.

Studies on the *similarity effect* have revealed that similar alternatives lose more market share when a new alternative (*S*) is introduced (Tversky, 1972). Consequently, for the removal of a brand, we expect that a similar brand will regain more market share than a dissimilar alternative (*negative similarity effect*):

H1: *If an alternative S is removed from a choice set, the probability of choosing the similar alternative C will increase disproportionately, i.e.*

$$\frac{P(C|\{T,C\})}{P(T|\{T,C\})} > \frac{P(C|\{T,C,S\})}{P(T|\{T,C,S\})}.$$

With regard to the widely discussed *attraction effect,* a decoy alternative has the ability to increase the attractiveness of the target relative to a competitor when the new product is dominated by the target and not by the competitor (Huber and Puto, 1983). Accordingly, for market exit, the target brand will lose its dominant position and will be considered relatively less attractive if a dominated or relatively inferior alternative disappears (*negative attraction effect*):

H2: *If an asymmetrically dominated alternative D is removed from a choice set, the probability of choosing the previously dominating alternative T will not rise or only rise disproportionately, i.e.*

$$\frac{P(T|\{T,C\})}{P(C|\{T,C\})} < \frac{P(T|\{T,C,D\})}{P(C|\{T,C,D\})}.$$

The *compromise effect* denotes the situation that the share of a brand increases when it is an intermediate option in the choice set (Simonson, 1989). If a brand loses its "compromise" position as a consequence of a removal of another brand, we hypothesize that it will be perceived as being less attractive and accordingly, will lose choice share or will only gain disproportionate choice share (*negative compromise effect*):

H3: *If an extreme alternative E is removed from a choice set, the probability of choosing the previously intermediate alternative T will not rise or only rise disproportionately, i.e.*

$$\frac{P(T|\{T,C\})}{P(C|\{T,C\})} < \frac{P(T|\{T,C,E\})}{P(C|\{T,C,E\})}.$$

To address the purpose of our research and to test the formulated hypotheses, four empirical studies are conducted. It will be shown if the predicted *negative* context effects prove true for customers' switching patterns after brand delistings.

3.4 Empirical Studies

We carried out four separate studies for testing the effects of delisting on the shifts in brand choice shares. While the details of each study are given later (4.1 – 4.4), their objectives can be briefly summarized. Both Study 1 and Study 2 cover real-life experiments and exemplarily examine the *negative attraction effect* and the *negative similarity effect* in two different fast moving consumer good (FMCG) categories, within subjects. The studies were conducted after the delisting of the underlying brands in a major retail chain. In the third study, the *negative similarity effect* is replicated for another FMCG category but in a more general experimental setting. The fourth investigation is again an experimental study and permits a test of the *negative attraction effect* and the *negative compromise effect* for durable consumer goods, both within and across subjects.

In each study, respondents were confronted with two choice tasks including an initial and a reduced choice set which were offered in an alternative by attribute matrix format. For every product class, subjects were asked to select one alternative using only the information provided and to assume that all other aspects were identical among the available choices. In addition, they were told that there were no right or wrong answers and that they should consider only their personal preferences. In each study, we organized a lottery as an incentive to participate. The winners received cinema tickets, Amazon vouchers or iPod shuffles. The specific experimental designs employed are summarized in Table 3.1 and described next. To evaluate the outcome, the results of our context experiments are compared with the predictions of classical choice theory.

	Experiment (sample size)	Experimental design	Product category	Dimensions	Negative context effects	Choice data
Study 1	real-life quasi-experiment (n=210)	pretest-posttest within-subjects design	frozen pizza (FMCG)	quality & taste, balanced diet, price (generated by PCA)	*NSE*[a] *NAE*[b]	nominal
Study 2	real-life quasi-experiment (n=354)	pretest-posttest within-subjects design	cereal (FMCG)	price and quality	*NSE*[a]	nominal and ratio
Study 3	online experiment (n=333)	pretest-posttest within-subjects design	orange juice (FMCG)	price and quality	*NSE*[a]	ratio
Study 4	online experiment (n=262)	pretest-posttest within- and between-subjects design	MP3 player (durable)	memory in GB, battery life in hours	*NAE*[b] *NCE*[c]	nominal

[a] *Negative similarity effect,* [b] *Negative attraction effect,* [c] *Negative compromise effect*

Table 3.1: Overview of the Conducted Studies

3.4.1 Study 1

The first study is based on data from a real-life quasi-experiment and involves a major European retail chain that started to restructure its product line in the food segment by eliminating one of the leading brands (A) in the frozen pizza category in spring 2009. Prior to that, four initial brands were available in the studied foods assortment at the examined discounter: two brands A and B from the same food manufacturer, one competitor brand C and one private label brand D. A preliminary analysis will reveal the competition in the concerned frozen foods market before delisting. Afterwards, hypotheses are specified and tested.

3.4.1.1 Data Collection and Method

Given that pizza is one of the major dishes of young people, 329 individuals, primarily students at a large German university, were recruited to participate in an online survey. Earlier studies on context effects have also employed student samples as a valuable resource of information (Huber et al., 1982). Respondents who did not complete the questionnaire or did

not exhibit the required familiarity with the considered product category were excluded from the analysis. The final sample included 216 respondents with a mean age of 26.8, 64 percent of them were female and the average household consisted of 2.1 people. In the first part of the survey, participants' involvement and interest in the product category were measured and the presented alternatives had to be judged on different attributes. The second part of the questionnaire permitted a test of the generated hypotheses. We used a pretest-posttest within-subjects design. To measure the reactions and shifts in choice shares, participants were presented a first choice task including the four alternatives (A, B, C and D). After answering some general questions about nutrition and buying behavior (filler tasks), respondents were confronted with the reduced choice set which contained the three remaining brands (B, C and D) and the additional options to switch stores or cancel the purchase completely.

3.4.1.2 Principal Components Analysis and Derived Hypotheses

Initially, a principal component analysis was performed to gain insights into important dimensions and the competition in the studied pizza market. To obtain data for the analysis, respondents were asked to judge each of the four brands using twelve different attributes on a five-point Likert scale ranging from 1 (do not agree at all) to 5 (totally agree). In addition to product name and pricing information, a picture of the product packaging was presented to enhance realism. All checked criteria (*MSA= 0.895, Barlett's test of sphericity, $p<0.000$*) supported the applicability of the analysis. The common principles (e.g., Kaiser-criterion) were employed to identify the number of extracted components. Further investigation of the Varimax rotated components enabled the interpretation of a three-component-solution: *quality & taste* (component 1), *balanced diet* (component 2) and *price* (component 3). Subsequently, mean factor scores were computed for each brand and were used to illustrate the positions of

the brands in a three-dimensional space which revealed the initial competition in the market (see Figure 3.2).

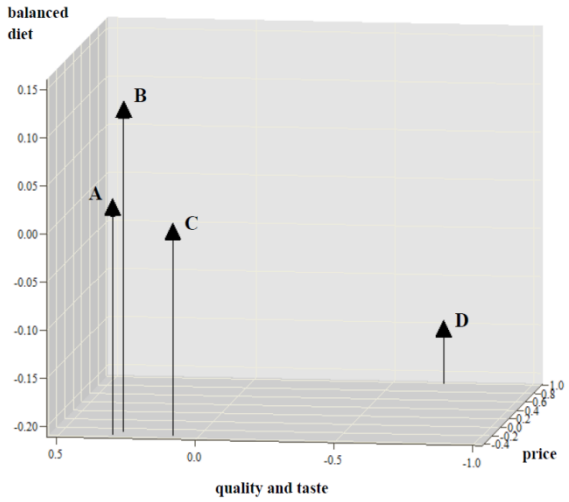


Figure 3.2: Attribute Space Before Delisting (Pizza, Study 1).

Two groups of competitors can be determined: Brand C appears to be the main competitor of brand A. This implies that the two brands were perceived to be most similar with regard to the included attributes. Accordingly, the first hypothesis about shifts in market share can now be specified.

***H1*$_{pizza}$**: *If alternative A is delisted, the probability of choosing the similar alternative C will rise disproportionately, i.e.*

$$\frac{P[C|\{B,C,D\}]}{P[J|\{B,C,D\}]} > \frac{P[C|\{A,B,C,D\}]}{P[J|\{A,B,C,D\}]}, J = \{B,D\}$$

Additionally, brand A can be considered a relatively inferior alternative ("decoy") to the "target" brand B based on the included attributes (Huber and Puto, 1983). Hence, *H2* claims:

***H2*$_{pizza}$**: *If the dominated alternative A is removed, the probability of choosing alternative B will not rise or only rise disproportionately, i.e.*

$$\frac{P[B|\{B,C,D\}]}{P[J|\{B,C,D\}]} < \frac{P[B|\{A,B,C,D\}]}{P[J|\{A,B,C,D\}]}, J = \{C,D\}$$

3.4.1.3 Analysis and Results

The observed relative frequencies of each choice scenario are reported in Table 3.2. In the first decision situation, 27.32 percent of the respondents picked brand A, 31.94 percent brand B, 12.50 percent brand C and 28.24 percent selected the private label brand D. In the second choice scenario (after delisting), brand B was chosen by 39.81 percent, 24.08 percent of the respondents decided to select brand C and 33.33 percent picked brand D. Store switching was only selected by two participants (0.93 percent) and only four respondents (1.85 percent) decided not to purchase at all. The small portion of respondents who intended to drop their entire purchase is a distinctive observation for FMCG categories. This outcome is in line with previous research on OOS reactions (Campo et al., 2000). These small portions are hereafter neglected in order to test our hypotheses.

	Before delisting	**After delisting**
Brand A	27.32%	
Brand B	31.94%	39.81%
Brand C	12.50%	24.08%
Brand D	28.24%	33.33%
(Store switching)		(0.93%)
(Purchase cancellation)		(1.85%)

Table 3.2: Relative Frequencies of Choice Options Before and After Delisting (Pizza, Study 1).

In Table 3.3, actual ($\Delta MS_{i,observed}$) and postulated ($\Delta MS_{i,IIA}$) choice shifts are opposed to discover disproportionate movements of choice shares. Therefore, we compare the choice shares expected by the traditional choice approach and the results of the brand delisting experiment under context specific assumptions.

			Context-dependence	*Classical theory*	
Brand i	$MS_{i,1}$	$MS_{i,2}$	$\Delta MS_{i,observed}$	$\Delta MS_{i,IIA}$	*Difference*
Brand B	32.38%	40.95%	+8.57%^{ns}	+11.77%	-3.20%
Brand C	12.86%	24.76%	+11.90%***	+4.68%	+7.23%
Brand D	28.10%	34.29%	+6.19%^{ns}	+10.22%	-4.03%

$MS_{i,1}$: market share of brand i before delisting, $MS_{i,2}$: market share of brand i after delisting
*** significant deviation of $\Delta MS_{i,IIA}$, $p \leq 0.01$,
^{ns} deviation not significant, $p > 0.1$

Table 3.3: Shifts in Choice Shares (Pizza, Study 1).

If brand A is delisted, the choice share of the competitor brand C is almost doubled. Specifically, the increase in market share ($\Delta MS_C = +11.90$ *percent*) is significantly higher than postulated by the *IIA* assumption ($\Delta MS_{C,IIA} = +4.68$ *percent*) with $\chi^2 = 7.597$, *d.f.=1*, $p = 0.006$. Consequently, keeping with $H1_{pizza}$, a *negative similarity effect* is also prevalent for a removal of a product. Additionally, the same-manufacturer brand B can only adopt a smaller part of former buyers of brand A. Compared to the predicted shift in market share ($\Delta MS_{B,IIA} = 11.77$ *percent*), the increase in market share is only 8.57 percent, though the difference is not significant ($\chi^2 = 0.876$, *d.f.=1*, $p = 0.349$). However, the choice share rises less than proportionally. Therefore, it can be concluded that for market exit a *negative attraction effect* also exists; $H2_{pizza}$ is partially confirmed. To investigate whether these results could be generalized to other categories as well, the approach is extended to further product classes in the following experiments.

3.4.2 Study 2

In the second study, another real-life quasi experiment was carried out to replicate the effects of Study 1. This time, a major European retail chain planned to reduce its assortment size by removing one of the leading brands (A) in the cereal category at the beginning of 2010. Initially, three brands were stocked on the shelves of the considered discounter, brand A (a major European food manufacturer's brand), brand B (main competitor of A) and brand C (a private label brand) (see Figure 3.3).

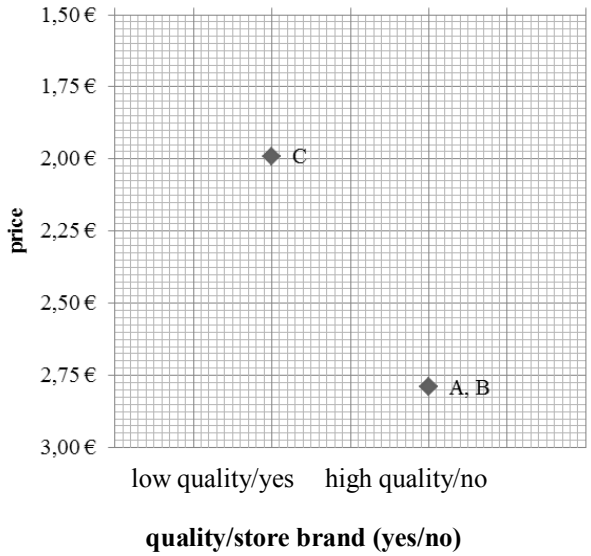


Figure 3.3: Attribute Space Before Delisting (Cereal, Study 2)

3.4.2.1 Data Collection and Method

The dataset was collected by means of an online questionnaire distributed at a large German university among students attending different courses at the faculty of business and economics. In total, 603 individuals participated. After discarding the incomplete surveys and participants who were not familiar with the product category, the final sample consisted of 354 respondents (52 percent female) with a mean age of 27 and an average household size of

2.1. A pretest-posttest within-subjects design and a three-stage approach were employed. After being asked about their familiarity and knowledge with regard to the analyzed product category, participants were confronted with the first decision situation - the three-brand choice set ({A,B,C}). Prior to the second choice task, respondents answered some questions about their general buying behavior (filler tasks). Then, they were again supposed to choose a package of cereal. In addition, they were informed that the cereal brand A was delisted by the retailer. Consequently, the second choice scenario included the two remaining brands B and C and an additional option to switch the store. Finally, the respondents were forced to substitute, i.e. they had to select one of the remaining brands. Each of the three choice tasks comprised two decisions respectively: (1) the respondents selected the alternative they would buy (nominal choice), and (2) they allocated preference ratings on a constant sum scale[11] (ratio choice).

3.4.2.2 Analysis and Results

In the initial setting of this real-life quasi-experiment, brand A and brand B can be perceived as being similar alternatives. Both brand A and B offer a high quality of an established brand and a high price level. On the other side, the private label brand C represents a low-quality and low-priced alternative. Accordingly, we can adjust our general hypothesis *H1* on the *negative similarity effect* to this experimental setting. We claim:

[11] The instruction for the constant sum scale task was: "Based on your preference, please distribute 100 points among the brands, giving most points to the brand you prefer most. Make sure the points add up to 100." (Hauser and Shugan, 1980).

H1 $_{cereal}$: *If alternative A is delisted, the probability of choosing the similar alternative B will rise disproportionately, i.e.*

$$\frac{P(B|\{B,C\})}{P(C|\{B,C\})} > \frac{P(B|\{A,B,C\})}{P(C|\{A,B,C\})}.$$

In this experiment, the shifts in choice shares can be analyzed by means of the nominal data as well as by means of the ratio data. Both the nominal choices and the distributed preference points before and after delisting are illustrated in Table 3.4.

	Before delisting		**After delisting**			
			General reaction		**Forced substitution**	
Brand i *(attributes)*	*Nominal choice*	*Preference points*	*Nominal choice*	*Preference points*	*Nominal choice*	*Preference points*
Brand A *(high, 2.79€)*	42.94%	42.21	-	-	-	-
Brand B *(high, 2.79€)*	20.34%	25.69	43.22%	43.55	54.24%	54.39
Brand C *(low, 1.99€)*	36.72%	32.10	40.96%	40.51	45.76%	45.61
Store switching	-	-	15.81%	15.95	-	-

Table 3.4: Relative Frequencies and Preference Points of Choice Options Before and After Delisting (Cereal, Study 2).

To test *H1* $_{cereal}$ on the *negative similarity effect*, we again compare the choice shifts predicted by the *IIA*-model and the observed choice shares. Table 3.5 includes the results.

Brand i	$MS_{i,1}$	$MS_{i,2}$	Context-dependence $\Delta MS_{i,observed}$	Classical theory $\Delta MS_{i,IIA}$	*Difference*
			Nominal choice		
Brand B	20.34%	54.23%	+33.89%**	+15.30%	+18.59%
Brand C	36.72%	45.76%	+9.04%***	+27.63%	-18.59%
			Preference points[a]		
Brand B	25.69	54.39	+28.71***	+18.76	+9.95
Brand C	32.10	45.61	+13.50***	+23.45	-9.95

*** $p \leq 0.01$, ** $p \leq 0.05$, [a] The results of the forced substitution task are employed.

Table 3.5: Shifts in Choice Shares (Cereal, Study 2).

The demonstrated results support our hypothesis $H1_{cereal}$. If brand A is delisted, the choice share of the similar brand B is more than doubled. In particular, the observed increase in choice share $\Delta MS_{B,observed}=+33.89$ *percent* is significantly higher than the shift proposed by the *IIA* assumption $\Delta MS_{B,IIA}=+15.30$ *percent* with $\chi^2=53.350$, *d.f.=1*, $p=0.000$. Accordingly, the similar competitor brand can increase its market share disproportionately. This finding is supported by the ratio data. In contrast to the predicted increase in preference points $\Delta MS_{B,IIA}=+18.76$, we can observe a significantly larger shift $\Delta MS_{B,observed}=+28.71$ with $t=4.764$, *d.f.=353* and $p=0.000$. Therefore, it can be concluded that a *negative similarity effect* is also prevalent for the removal of cereal brand A. According to this, the results of our first study are validated for another product category and the importance of considering *negative* context effects when brands are to be delisted is confirmed. In the next step, the effect is generalized by utilizing hypothetical products and adjusting the experimental setting.

3.4.3 Study 3

The third study was undertaken in the product category non-frozen orange juice. The aim of this study was to extend the findings of the two real-life studies 1 and 2 on *negative* context effects to choice situations without concrete brands. In this experiment, hypothetical products

were constructed such that the four initially available alternatives, which differ on two dimensions (price and quality), lie on the same trade-off line and always two items resembled each other (see Figure 3.4). The two alternatives A and B symbolize high quality and are offered at a high price; by contrast C and D form two low-quality and low-priced alternatives. Additionally, in this experiment, individuals were confronted with the delisting of their preferred alternative.

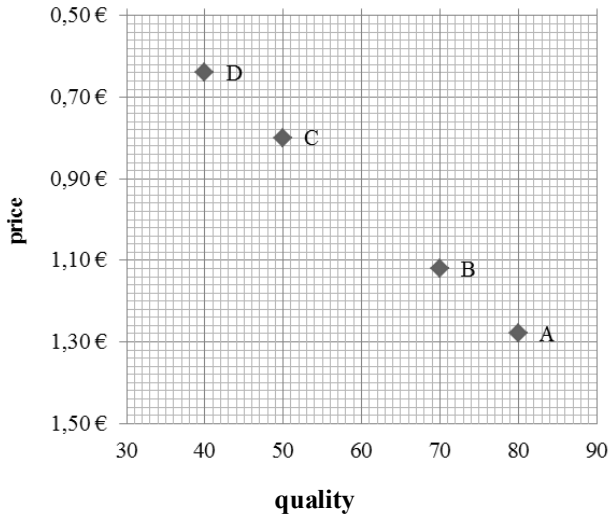


Figure 3.4: Attribute Space Before Delisting (Orange Juice, Study 3)

3.4.3.1 Data Collection and Method

Participants for this survey were addressed via email by using a university-wide mailing list. Thus, students from different fields of study were involved. The final sample consisted of 333 individuals (65.8 percent female) with an average age of 25 and a mean household size of 2.1. A pretest-posttest within-subjects design was again utilized to measure the choice behavior and the resulting shifts in choice shares; however, after the first decision situation, respondents were confronted with a reduced choice set in which their initially preferred

alternative was not provided. Accordingly, in the associated analysis, only the ratio data can be used.

3.4.3.2 Analysis and Results

In the first choice set, both alternatives A and B, and alternatives C and D form similar options respectively. As the second choice set (after delisting) depends on the selected preference product of each respondent in the first choice task, for this experimental setting the hypothesis on the *negative similarity effect* has to be formulated and tested for each scenario (i.e. each preference product).

H1 $_{orange\ juice}$: *If alternative I is delisted, the probability of choosing the similar alternative J will rise disproportionately, i.e.*

$$\frac{P(J|\{J,K\})}{P(K|\{J,K\})} > \frac{P(J|\{I,J,K\})}{P(K|\{I,J,K\})},$$

$$I = \begin{cases} A, \text{ if } A \text{ is preferred in } t=1 \\ B, \text{ if } B \text{ is preferred in } t=1 \\ C, \text{ if } C \text{ is preferred in } t=1 \\ D, \text{ if } D \text{ is preferred in } t=1 \end{cases}, \quad J = \begin{cases} B, \text{ if } I=A \\ A, \text{ if } I=B \\ D, \text{ if } I=C \\ C, \text{if } I=D \end{cases}, \quad K = \begin{cases} \{C,D\}, \text{ if } I=A \\ \{C,D\}, \text{ if } I=B \\ \{A,B\}, \text{ if } I=C \\ \{A,B\}, \text{if } I=D \end{cases}.$$

The results of the allocated preference points for each scenario are displayed in Table 3.6. The test of the derived hypotheses is once more performed by a comparison of the observed and the predicted shifts in choice shares (see Table 3.7).

	Preference product			
	A	***B***	***C***	***D***
Brand i *(attributes)*		*Before delisting*		
A *(80, 1.28€)*	75.48	18.56	10.91	4.09
B *(70, 1.12€)*	17.02	57.75	15.43	5.00
C *(50, 0.80€)*	4.81	17.80	59.57	14.55
D *(40, 0.60€)*	2.69	5.89	14.09	76.36
		After delisting		
A *(80, 1.28€)*	-	59.17	9.57	3.45
B *(70, 1.12€)*	89.90	-	44.71	4.82
C *(50, 0.80€)*	6.88	34.85	-	91.73
D *(40, 0.60€)*	3.22	5.98	45.71	-

Table 3.6: Preference Points of Choice Options Before and After Delisting (Orange Juice, Study 3).

			Context-dependence	***Classical theory***	
Brand i	$MS_{i,1}$	$MS_{i,2}$	$\Delta MS_{i,observed}$	$\Delta MS_{i,IIA}$	***Difference***
			Preferred brand = A		
Brand B	17.02	89.90	+72.88***	+52.39	+20.49
Brand C	4.81	6.88	+2.07***	+14.81	-12.74
Brand D	2.69	3.22	+0.53***	+8.27	-7.74
			Preferred brand = B		
Brand A	18.56	59.17	+40.61***	+25.36	+15.25
Brand C	17.80	34.85	+17.05**	+24.33	-7.29
Brand D	5.89	5.98	+0.09***	+8.05	-7.96
			Preferred brand = C		
Brand A	10.91	9.57	-1.34***	+16.08	-17.43
Brand B	15.43	44.71	+29.29ns	+22.73	+6.55
Brand D	14.09	45.71	+31.63ns	+20.76	+10.87
			Preferred brand = D		
Brand A	4.09	3.45	-0.64***	+13.22	-13.85
Brand B	5.00	4.82	-0.18***	+16.15	-16.34
Brand C	14.55	91.73	+77.18***	+46.99	+30.19

*** $p \leq 0.01$, ** $p \leq 0.05$, ns=not significant ($p > 0.1$)

Table 3.7: Shifts in Choice Shares (Orange Juice, Study 3).

In all four scenarios, the most similar alternative gains most of the choice share of the previously preferred and consequently delisted alternative, i.e. the allocated preference points increase disproportionately. If brand A (B, D) is delisted, the increase in preference points of

its similar alternative $\Delta MS_{B,observed}=+72.88$ ($\Delta MS_{A,observed}=+40.61$, $\Delta MS_{C,observed}=+77.18$) is significantly higher than the shift $\Delta MS_{B,IIA}=+52.39$ ($\Delta MS_{A,IIA}=+25.63$, $\Delta MS_{C,IIA}=+46.99$) postulated by the *IIA* assumption with $t_B=14.023$, $d.f.=175$ and $p=0.000$ ($t_A=4.569$, $d.f.=110$, $p=0.000$, $t_C=5.117$, $d.f.=10$, $p=0.000$). For the initial preference of alternative C, the effect is also present but not significant. In summary, $H1_{orange\ juice}$ is supported and it can be concluded that the *negative similarity effect* represents a robust phenomenon of customer reactions to delisting of FMCGs. For retailers, the question of whether these *negative* context effects also exist for durable goods is of special interest. The subsequent study will answer this question.

3.4.4 Study 4

The purpose of the fourth study was to verify the existence of the discovered *negative attraction effect* (see Study 1) for durable goods, in this case MP3 players. In addition, it was used to test the third suggested hypothesis on a *negative compromise effect* and to validate the results across subjects. MP3 players were selected as the product category because of the large familiarity in the studied sample. Two different choice scenarios were applied – scenario 1 to validate the *negative attraction effect* (see Figure 3.5.1), and scenario 2 to test the *negative compromise effect* (see Figure 3.5.2). The initially available three alternatives can be distinguished by two attributes, respectively: memory in gigabytes (GB) and battery life in hours.

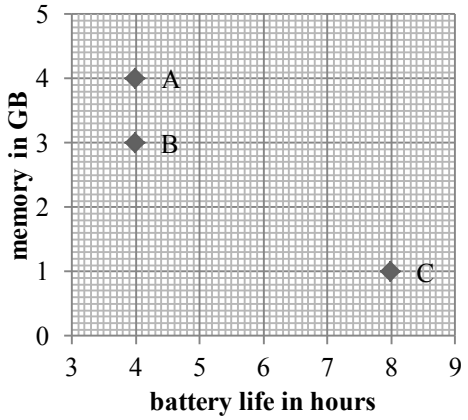


Fig. 3.5.1 Scenario1: negative attraction effect

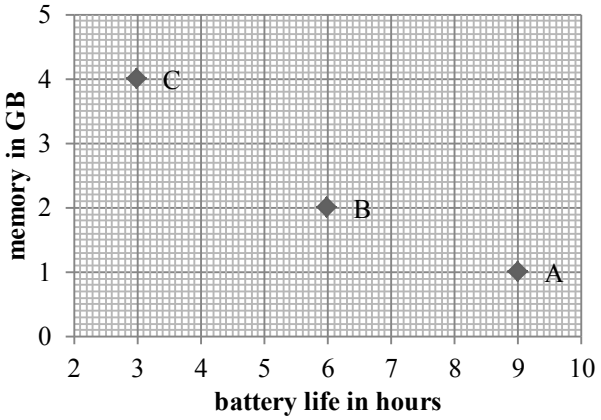


Fig. 3.5.2 Scenario 2: negative compromise effect

Figure 3.5: Attribute Space Before Delisting (MP3 Player, Study 4)

3.4.4.1 Data Collection and Method

Data for this study was collected by means of a questionnaire which was distributed both online and offline at a large German university and primarily to students since they represent the major target group of MP3 player manufacturers. In total, 397 individuals participated. For our analysis we kept 364 respondents who showed the demanded familiarity with the product in order to measure preference. The mean age was 26, the average household size was 1.9 and 56.9 percent of the participants were female. For each scenario, two different methods were applied: firstly, a pretest-posttest within-subjects design; and secondly, a between-subjects design. With regard to the pretest-posttest within-subjects design, the same three-stage approach from Study 2 was utilized to quantify the effects. Using the between-subjects design, the choice shares of an experimental group (confronted with the three-item choice set) and a control group (faced with the two-item choice set) were compared.

3.4.4.2 Analysis and Results

In the first scenario, the three-item choice set consists of alternative A, B and C in which B is asymmetrically dominated by A (see Figure 3.5.1). Consequently, hypothesis 2 can be concretized:

H2 $_{MP3\ player}$*: If the dominated alternative B is removed, the probability of choosing alternative A will not rise or only rise disproportionately, i.e.*

$$\frac{P(A|\{A,C\})}{P(C|\{A,C\})} < \frac{P(A|\{A,B,C\})}{P(C|\{A,B,C\})}.$$

The initial choice set in the second scenario includes three alternatives (A, B and C) that are located approximately on the same trade-off line (see Figure 3.5.2). The "target" alternative B can be perceived a compromise option. Accordingly, we suggest:

H3 $_{MP3\ player}$***: If the extreme alternative C is removed, the probability of choosing the previously intermediate alternative B will not rise or only rise disproportionately, i.e.***

$$\frac{P(B|\{A,B\})}{P(A|\{A,B\})} < \frac{P(B|\{A,B,C\})}{P(A|\{A,B,C\})}.$$

The relative frequencies of the choice options before and after delisting for both scenarios and groups are summarized in Table 3.8.

	Before delisting	After delisting	
Brand i *(attributes)*	*Scenario 1 (negative attraction effect)*		
		Experimental group	Control group
Brand A *(4 hours, 4 GB)*	59.16%	61.83%	58.54%
Brand B *(4 hours, 3 GB)*	5.73%	-	-
Brand C *(8 hours, 1 GB)*	35.11%	38.17%	41.46%
	Scenario 2 (negative compromise effect)		
		Experimental group	Control group
Brand A *(9 hours, 1 GB)*	12.21%	17.56%	21.95%
Brand B *(6 hours, 2 GB)*	77.48%	82.44%	78.05%
Brand C *(3 hours, 4 GB)*	10.31%	-	-

Table 3.8: Relative Frequencies of Choice Options Before and After Delisting (MP3 Player, Study 4).

To test whether a *negative attraction effect* and a *negative compromise effect* can be detected, we compare choices predicted by the *IIA* assumption with actual choices (within-subjects as well as between-subjects) on an aggregated level. If *IIA* holds, market shares of A and C (A and B in scenario 2) should rise proportionately if alternative B (C) disappears. Subsequently, we only consider the results of the nominal choice task which are displayed in Table 3.9 and are discussed subsequently.

Taking into account the first scenario, the choice share of the previously dominating alternative A only rises disproportionately. Whereas, for the within-subjects design (between-subjects design), the *IIA* assumption postulates a change in market share of $\Delta MS_{A,IIA}$=*+3.59 percent* ($\Delta MS_{A,IIA}$=*+3.59 percent*), the observed increase amounts to $\Delta MS_{A,observed}$=*+2.67 percent* ($\Delta MS_{A,observed}$=*-0.62 percent*) with χ^2=*0.094*, *d.f.=1*, *p=0.759* (χ^2=*0.623*, *d.f.=1*, *p=0.430*). This outcome is in line with the expected *negative attraction effect* since A is obviously perceived as being less attractive without the presence of the dominated option B. The shift in market share is, however, not significantly lower. Accordingly, hypothesis $H2_{MP3\ player}$ is only partially supported. Comparing the computed

expected market shares with the observed shares within-subjects in the second setting, we can conclude that the previous "compromise" alternative B is selected significantly less often ($\Delta MS_{B,observed}$=+4.96 *percent*) than predicted by *IIA* ($\Delta MS_{B,IIA}$=+8.90 *percent*) (χ^2=3.452, *d.f.=1, p=0.063*). Since B loses its intermediate position, it is perceived as being less attractive. Hypothesis $H3_{MP3\ player}$ is confirmed. This result is supported by the between-subjects results with χ^2=4.838, *d.f.=1*, *p=0.028* and documents the choice set dependence of preference modifications when an extreme alternative is removed from the market and accordingly the choice set.

			Context-dependence	***Classical theory***	
Brand i	$MS_{i,1}$	$MS_{i,2}$	$\Delta MS_{i,observed}$	$\Delta MS_{i,IIA}$	***Difference***
			within-subjects design, NAE[a]		
Brand A	59.16%	61.83%	+2.67%[ns]	+3.59%	-0.92%
Brand C	35.11%	38.17%	+3.05%[ns]	+2.13%	0.92%
			between-subjects design, NAE[a]		
Brand A	59.16%	58.54%	-0.62%[ns]	+3.59%	-4.22%
Brand C	35,11%	41.46%	+6.35%[ns]	+2.13%	+4.22%
			within-subjects design, NCE[b]		
Brand A	12.21%	17.56%	+5.34%[*]	+1.40%	+3.94%
Brand B	77.48%	82.44%	+4.96%[*]	+8.90%	-3.94%
			between-subjects design, NCE[b]		
Brand A	12.21%	21.95%	+9.74%[**]	+1.40%	+8.33%
Brand B	77.48%	78.05%	+0.57%[**]	+8.90%	-8.33%

[**] $p \leq 0.05$, [*] $p \leq 0.1$, [ns]=not significant ($p > 0.1$)
[a] *Negative attraction effect,* [b] *Negative compromise effect*

Table 3.9: Shifts in Choice Shares (MP3 Player, Study 4).

3.4.5 Summary of Findings

The results of the discussed studies demonstrate that context matters for customer reactions on delisting. Three major *negative* context effects were found (see Table 3.10). Studies 1, 2 and 3 highlighted the occurrence of a *negative similarity effect* for the removal of different FMCGs,

i.e. customers tend to substitute with a similar brand. The second phenomenon, which was confirmed by the outcomes of Study 1 for FMCGs and Study 4 for durables, is the existence of a *negative attraction effect*. According to this, the relative choice share of a previously dominating option is diminished due to the delisting of the dominated brand. A *negative compromise effect* was verified in Study 4 and emphasizes the decrease in the relative choice share of intermediate options if an extreme alternative is removed from the choice set. In addition, the results of the two real-life quasi-experiments reveal switching patterns which collectively lead to bigger damages for manufacturers than for retailers. Being confronted with the reduced choice, the majority of individuals switched to the main competitor of the delisted brand.

Hypotheses		Study	Product category	Initial choice set	Result
H1	*Negative similarity effect*	1	pizza	4 items	✓
		2	cereal	3 items	✓
		3	orange juice	4 items	✓[1]
H2	*Negative Attraction effect*	1	pizza	4 items	(✓)
		4	MP3 player	3 items	(✓)
H3	*Negative compromise effect*	4	MP3 player	3 items	✓

✓ The hypothesis is supported.
(✓) The hypothesis is partially supported.
[1] Only for the initial preference product C is the effect insignificant.

Table 3.10: Summary of Results

3.5 Discussion

Our paper provides evidence that the widely discussed context effects for an expansion of the choice set are also present in situations when items or brands are removed. In particular, the meaningful impact of unavailable options on preferences and consequently choice behavior is

shown. Thereby, rational principles of choice are violated. The current research reveals that removing "dominated", "similar" or "extreme" alternatives from the shelf affects the choice shares of the remaining brands in a theory-based predictable way. Our findings contribute to marketing literature on context effects by empirically documenting the impact of choice set reduction on preference shifts in several FMCG categories as well as for durables. By considering real-life examples, our findings make context effects and *negative* context effects more relevant to managers. They should take these effects into account when deciding on the reduction of their assortments and brand portfolios, respectively.

3.5.1 Managerial Implications

The results of the two real-life quasi-experiments illustrate that delisting can harm the manufacturer. In Study 1, the food manufacturer of brand A and B lost a remarkable portion of its customers (-18.09 percent) because many respondents decided to switch brands rather than moving to sub-brands. In the second choice scenario, only 32.15 percent of the previous buyers of brand A selected brand B (from the same food company), indicating loyalty to the company. By contrast, the competitor brand (C) benefited most from the removal of brand A. It adopted the major portion of recent buyers of brand A and also kept its own customers. The same behavioral pattern was observable in the second study. Only 15.81 percent of the participants intended to switch the store to buy their preferred but delisted brand. On the contrary, the major rival managed to more than double its choice share. The results also indicate that even if it is typically the retailer who decides on delisting of brands, the retail brand may not be the winner in the competitive situation. To evaluate the specific impacts on retailers' returns further information on realized margins would be needed. However, we can conclude that sales were not so highly affected since, in each study nearly all subjects decided in favor of substitution rather than switching stores. The robust *negative similarity effect*,

which was demonstrated in three studies, recommends retailers to always offer a similar alternative to keep customers in the store. Consequently, both retailers and manufacturers should pay attention to the competition environment and employ consolidated findings on the context-dependence of choice when deciding and negotiating on prices and shelf space.

3.5.2 Limitation and Future Research

A major limitation of our research is that the results are based only on reported delisting responses. Despite the fact that data collection by means of a questionnaire can be criticized in different ways, a substantial advantage of questionnaires over real choices represents the possibility to differentiate clearly between the potential reactions. In addition, surveys allow collecting supplementary information, which can be utilized to explain stated behavior. In our experiments, respondents faced a hypothetical delisting situation, which altogether may lower the external validity. However, the questionnaire allows us to collect relevant information necessary to address the specific research objective. There is broad support in the literature that hypothetical and real choices can lead to the same results (Kühberger et al., 2002; Wiseman and Levin, 1996). Furthermore, the hypotheses were tested by means of aggregated data. The analysis covered four different product categories, and choice was limited to four-item and three-item choice sets.

These boundaries generate opportunities for future research. The findings have to be generalized by examining more categories in a real-world shopping situation. Scanner panel data across stores could enable the development of a tool to determine consequences and practical implications for manufacturers and retailers prior to brand delistings. Developing effective strategies to manage dissatisfaction due to delistings would be another useful and interesting area to explore. For instance, is suggesting an available alternative a positive or negative approach? Should retailers communicate that a brand is going to be delisted? Should

they offer an equivalent store brand? Besides this operational objective, additional moderators should be included when analyzing the outcome of a delisting strategy. A model that analyzes the drivers of brand choice can be used to cover complex relationships between major antecedents and constructs related to the delisting effects.

4 THE IMPACT OF CONTEXT AND PROMOTION ON CONSUMER RESPONSES AND PREFERENCES IN OUT-OF-STOCK SITUATIONS

Wiebach and Diels (2011)

Discussion Paper

ABSTRACT

In general, consumer preferences depend on the context of a decision situation. This paper highlights the context-dependence of substitution behavior in out-of-stock (OOS) situations and provides evidence for the relevance of promotion as essential driver of customers' OOS reactions. We demonstrate both theoretically and empirically how OOS-induced preference shifts can be explained and predicted using context and phantom theory. In a series of experiments, we show that consumers substitute in accordance to a negative similarity effect, which is reduced for stock-outs of promoted low-involvement FCMGs. If a similar substitute is offered at a reduced price, the effect is enforced. For dissimilar substitutes, we show the contrary. The empirical findings further suggest an augmented probability of purchase postponement and a significant smaller chance of brand switching for stock-outs of promotional products. Furthermore, our study emphasizes outlet switching as a so far uninvestigated OOS reaction and discusses implications for retailers and manufacturers.

4.1 Introduction

Out-of-Stock (OOS) is not only a prevalent problem in today's retailing practice but also of high relevance in online and service sectors such as airlines or hotels. With regard to stationary retailing, the European Optimal Shelf Availability (OSA) survey revealed an average OOS level of 7.1% and an augmented rate of 10% for items on promotion (ECR Europe and Roland Berger, 2003). Customers encountering such OOS situations are forced to react. Potential behavioral responses include item switching, brand switching, store switching, as well as purchase postponement and cancellation (Emmelhainz et al., 1991; Sloot et al., 2005). Depending on the respective response, both retailers and manufacturers may face severe damages (Campo et al., 2000). In the short run, possible risks for the manufacturer comprise an unexpected cannibalization of its own product range or the loss of customers to competing brands. Conversely, if customers decide to look for the missing item in another store, the retailer faces major losses. In the long run, OOS situations represent a serious threat to brand and store loyalty (Karakaya, 2000).

The focus of previous OOS research is twofold: Firstly, the studies have looked at the magnitude of the potential behavioral responses. The results, however, vary strongly from study to study (Emmelhainz et al., 1991; Peckham, 1963; Sloot et al., 2005). Secondly, the studies have identified fundamental determinants of OOS responses. Typically, a classical choice approach (e.g., a multinomial logit model) is applied to relate certain product-specific, store-specific, consumer-specific and situation-specific variables and the potential OOS reactions (Campo et al., 2000; Hegenbart, 2009; Sloot et al., 2005; Zinn and Liu, 2001).

However, up to now, research on customer reactions to OOS has not explicitly regarded promotion as an influencing situational factor, although OOS particularly occurs for promoted

items, and some recent publications have underlined that this domain requires further research (Hegenbart, 2009; Sloot et al., 2005). Building on the empirical fact that customers adapt their buying behavior to promotional activities (Blattberg et al., 1981; Gupta, 1988), they can be expected to be especially dissatisfied if their purchase plans are hindered by a stock-out of the respective promoted product. Therefore, we assume OOS responses to differ from the so far discussed reactions when the unavailable item is on promotion. Additionally, promotions are known to drive purchase decisions with regard to brand and product choice (Blattberg and Jeuland, 1981). Therefore, they can also be expected to influence substitution decisions when a previously desired item is stocked out.

While the majority of studies have analyzed general reaction behavior in OOS situations, only little thought has so far been devoted to OOS-induced preference changes with regard to the remaining brands at the point of sale (Breugelmans et al., 2006; Campo et al., 2003). Another problem is that recent studies have primarily regarded the OOS problem in the context of the classical decision theory. This is a common assumption; however, is it reasonable to assume that preferences remain stable if the preferred brand is not available? If customers face an OOS situation, they are confronted with an entirely new decision situation represented by an altered choice set. Therefore, we claim that preferences shift as the relative attractiveness of an option is built on different reference criteria to compare the alternatives (Sheng et al., 2005).

In two studies, we use context theory (Huber et al., 1982; Simonson, 1989; Tversky and Simonson, 1993) and research on phantoms (Highhouse, 1996; Pratkanis and Farquhar, 1992) to explain and predict the preference shifts subsequent to an OOS in a theory-based way. Particularly, we focus on the effect of promotion to influence substitution decisions in OOS situations. The first study demonstrates that for the temporal unavailability of products, substitution patterns correspond to a *negative similarity effect (NSE)* (Tversky, 1972) which

is, however, reduced for stock-outs of low involvement FMCGs on promotion. In the second study, we show that the *NSE* is even enforced for promotions of similar substitutes. Yet, the effect is ruled out by the simultaneous occurrence of an attraction effect when dissimilar substitutes are offered at a reduced price.

Overall, our paper contributes to marketing and retailing literature (1) by including promotion as an important driver of customers' reactions in OOS situations, (2) by employing context and phantom theory to explain OOS-induced preference shifts and (3) by investigating substitution behavior in different experimental settings and making it predictable for retailers and manufacturers.

The paper is organized as follows: The next section briefly reviews theoretical aspects of context-dependent preferences and research on phantoms, thus providing the conceptual framework to deduct hypotheses on the effect of context and promotion on customer reactions and substitution patterns in OOS situations. We then describe the methodology to collect individual choice data in a series of online experiments, present the applied data analysis and test the derived hypotheses. We conclude with a general discussion of results and indicate implications as well as limitations and directions for future research.

4.2 Conceptual Framework

4.2.1 Preference Formation in Situations of Varying Choice Sets

Recent studies on OOS reactions have predominantly applied the assumptions of classical economic theory (e.g., regularity and Independence of Irrelevant Alternatives (*IIA*) (Luce, 1959)) and based their analyses upon criteria of rational choice. In contrast, extant research on consumer decision-making has revealed that consumers often do not have well-defined

preferences and construct choice when required (Bettman, 1979; Payne et al., 1992; Tversky et al., 1988). Accordingly, choices are dependent on the positions and the presence or absence of other alternatives (Bhargava et al., 2000; Huber et al., 1982; Simonson, 1989).

Research on the context-dependence of choice has so far brought into focus the effects of new product introduction on customers' preference formation. Researchers have revealed that in these situations the assumed preference shifts according to the classic economic theory are violated. Preference relationships among the core alternatives are changed subject to the altered choice set if a new alternative is included. In general, the studies have employed the following experimental set-up (see Figure 4.1): Subjects are initially confronted with a core set consisting of a target (*T*) and a competitor (*C*) in a two-dimensional space with approximately the same probability of choice. One core alternative is better on one dimension, whereas the counterpart is superior on the other dimension. Subsequently, a new option (*S, D* or *E*) is introduced adopting a specific position in the choice set and shifts in choice proportions are examined. In particular, it has been proven that by introducing a new option into the choice set (1) similar options lose proportionally more choice share than dissimilar ones (*similarity effect,* Figure 4.1.1) (Tversky, 1972), (2) dominating options can increase their choice share disproportionately (*attraction effect,* Figure 4.1.2) (Huber et al., 1982) and (3) options that become a compromise between two alternatives are chosen above average (*compromise effect,* Figure 4.1.3) (Simonson, 1989). Our study focuses on one of the most accepted phenomena: the similarity effect which has been demonstrated by Tversky (1972) and Debreu (1960).

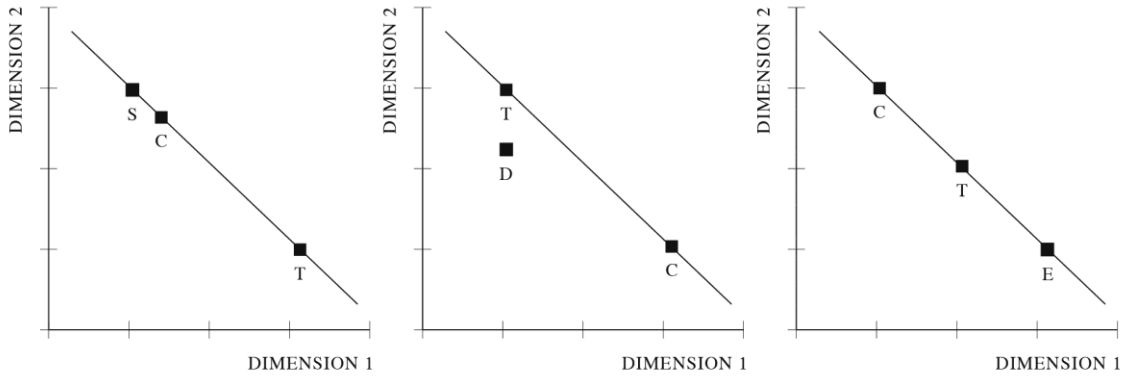


Figure 4.1.1: Similarity Effect

Figure 4.1.2: Attraction Effect

Figure 4.1.3: Compromise Effect

Figure 4.1: Similarity Effect, Attraction Effect and Compromise Effect

In contrast to the broadly covered research domain on new product introduction, the unavailability of items (e.g., OOS) and the resulting consequences for preference formation and choice have so far been paid less attention to in the literature. Yet, research on phantom alternatives offers a surplus knowledge to explain preference shifts in case of reduced choice sets. Here, a phantom alternative represents a choice option which looks real but for some reason is unavailable at the time a decision is made (Farquhar and Pratkanis, 1993). Although phantom alternatives only represent illusory options which cannot be chosen, they elicit an influence on the preference structure of a decision maker. This is because individuals utilize the 'irrelevant' information of phantoms to evaluate the available alternatives (Farquhar and Pratkanis, 1993). Phantom alternatives cause shifts in the preference structure which do not conform to the *IIA* assumption. Accordingly, a phantom alternative does not lead to a proportionate increase in the choice probabilities of the available alternatives but to disproportionate shifts in preference depending on different relative positions of the unavailable product.

With regard to those relative positions, literature on phantom alternatives has distinguished between asymmetrically dominating (Pettibone and Wedell, 2007) and

asymmetrically dominated phantoms (Fitzsimons, 2000; Hedgcock et al., 2009), relatively inferior (Doyle et al., 1999) and relatively superior phantoms and phantoms that are dominated by or are dominating both *T* and *C* (Gierl and Eleftheriadou, 2005). Despite the elaborate classification of phantoms, only few of these potential positions have so far been empirically tested. The majority of studies have analyzed the impact of asymmetrically dominating phantoms on preference formation proving a positive effect of *R* (range increasing)-phantoms on *T*'s choice probability in relation to *C* (Hedgcock et al., 2009; Highhouse, 1996; Scarpi, 2008). Possible explanations include loss aversion (Tversky and Kahneman, 1991), shifts in attribute importance (Hedgcock et al., 2009; Highouse, 1996), value shifts (Pettibone and Wedell, 2000) and the similarity substitution heuristic (Pettibone and Wedell, 2000; Tversky, 1972). Pettibone and Wedell (2007) further revealed that for asymmetrically dominating *F* (frequency increasing)- and *RF* (range frequency increasing)-phantoms the effect on *T*'s choice share is smaller than for range-increasing phantoms. Gierl and Eleftheriadou (2005) showed that asymmetrically dominating *F*- and *RF*-phantoms also lead to preference advantages of *C* in comparison to *T*.

The existing classification can be extended by adding phantom positions to the attribute space which are neither dominating nor dominated (i.e., they are located on the same trade-off-line as *T* and *C*). This way, the existence of the traditional context effects (similarity, attraction and compromise) in situations of unavailable choice options can be studied (Wiebach and Hildebrandt, 2011).

4.2.2 Hypotheses

Building on the results of previous OOS studies, the context-dependence of choice and phantom theory, we develop our system of hypotheses. The first part of our investigation focuses on the behavioral OOS responses and the influence of promotion. Particularly, we

assume that consumers who are faced with an OOS for a promoted item will tend to leave the store and change to another outlet of the same retail chain to benefit from the promotional offer. We base this assumption on empirical findings which show that customers consciously switch between retailers to make their purchases in stores offering price promotion and featuring on certain articles (Fox and Hoch, 2005). In contrast, the average of available empirical evidence on OOS responses suggests that 50% of OOS-affected customers are willing to substitute the missing item within the retail assortment. Accordingly, we expect customers who encounter a stock-out for a regular item to be more inclined to substitute, as they are not missing a special offer and are less motivated to switch the retail outlet. The marketing literature has typically viewed promotional activities as a reason for customers to stockpile (Blattberg et al., 1981; Van Heerde et al., 2003). That is, customers trade off inventory costs and product prices and consequently buy earlier and larger quantities of the promoted article than actually required. Since time of purchase and time of consumption do not necessarily correspond, it can be assumed that customers would rather defer a purchase for a product that is OOS if this purchase was only motivated by a promotional offer. Consequently, we assume:

H1a: *In OOS situations of promoted items, customers change the outlet with higher probability than in OOS situations of non-promoted items.*

H1b: *In OOS situations of non-promoted items, customers show a higher probability to substitute than in OOS situations of promoted items.*

H1c: *In OOS situations of promoted items, customers postpone the purchase with higher probability than in OOS situations of non-promoted items.*

The second part of our analysis addresses customers' substitution patterns and preference changes. In this research, we primarily test the similarity hypothesis for product exit – the *NSE*. We build on prior research on preference formation for product entry to generate the respective hypotheses for the reversed scenario of product exit. Based on the assumption that all available alternatives lie on the same trade-off line and hence neither option dominates the other (see Figure 4.1.1), the similarity hypothesis for market entry asserts that a new alternative takes share disproportionately from more similar alternatives (Tversky, 1972). Due to the addition of *S* to the choice set, *S* and *C* are perceived as exchangeable options and constitute one cluster in the consumer's mind (categorization process) (Cohen and Basu 1987; Tversky, 1977). The loyalty of a potential buyer is divided by the similar items (Huber and Puto, 1983). By contrast, the perceived distance with regard to the dissimilar option *T* is increased (Parducci, 1965).

We propose for the inverse setting that in OOS situations the choice share of the similar and available item (*T*) will increase disproportionately, whereas the relative share of the dissimilar option (*C*) will decline when the preferred item (*S*) is OOS (see Figure 4.2.1). This is because customers seek to simplify the decision process and minimize the risk of substitution by switching to similar alternatives (Breugelmans et al., 2006). In addition, the expected preference shift can be explained by the loss-aversion principle (Tversky and Simonson, 1993). The assumption that losses loom larger than accordant gains (Kahneman and Tversky, 1979) predicts people to select the similar option. Besides, by choosing the similar option, the decision-maker with an initial preference for *S* obtains an item that is unambiguously superior to the unalike item on the obviously more important dimension. The postulated *NSE* results in a violation of the proportionality framework which underlies constant utility and independent random utility models of choice (Luce, 1959; Mc Fadden, 1980). Accordingly, we propose:

H2a: *In OOS situations of non-promoted and non-dominating items the NSE occurs.*

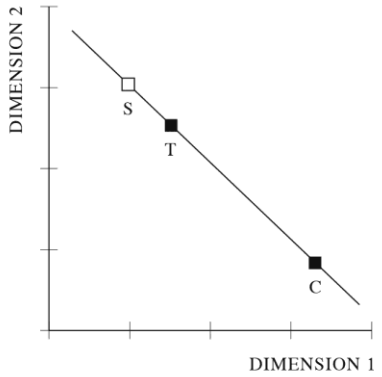


Figure 4.2.1: Negative Similarity Effect

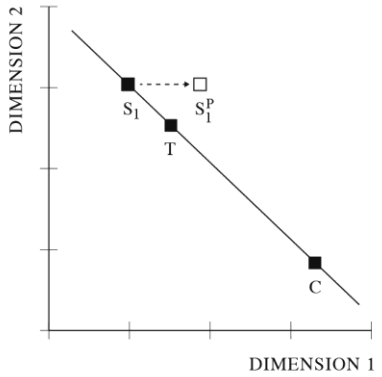


Figure 4.2.2: Asymmetrically Dominating Phantom

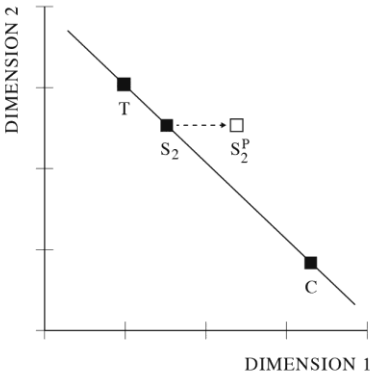


Figure 4.2.3: Relatively Superior Phantom

Figure 4.2: Negative Similarity Effect, Asymmetrically Dominating and Relatively Superior Phantom

However, if the OOS alternative is on promotion, its relative position is altered due to changes in price. Let us assume that dimension one comprises the attribute price and the previously available alternative S_1 illustrates a decision-maker's preferred item. Then, this preferred item is announced to be on promotion and OOS. Consequently, it is shifted in the attribute space as illustrated in Figure 4.2.2 and referred to as S_1^P. Since for S_1^P the value of dimension two (e.g., quality) stays unaffected and the value of dimension one (price) improves as the item gets cheaper, it is perceived superior to the similar and available option T on both dimensions and can be construed as an asymmetrically dominating *RF*-phantom (Pettibone and Wedell, 2007). The dominated alternative T hence appears less attractive and its choice is harder to justify – findings supported by the dominance-heuristic (Highhouse, 1996; Simonson, 1989) and the loss-aversion principle of the relative advantage model (Tversky and Simonson, 1993). That is why, we expect the decision-maker to be less inclined to choose the similar (and dominated) alternative than in the setting without promotion. Thus, we predict the

increase in choice share of the similar option *T* to be smaller for the promotion setting. The *NSE* will consequently be alleviated.

The same holds true for another possible framing. If the initially preferred item S_2 is superior to the similar alternative *T* on dimension one (price) but inferior to *T* on dimension two (e.g., quality), the factor promotion leads to a shift in the attribute space as displayed in Figure 4.2.3. The position of the unavailable item S_2^P is dubbed relatively superior by Gierl and Eleftheriadou (2005). So far, this phantom position has not been tested. As the similar alternative *T* is relatively inferior to the OOS option, it is considered less attractive and its selection is again harder to justify (Highhouse, 1996; Simonson, 1989). In addition, the perceived distance to the initially dissimilar option *C* is diminished (Parducci, 1965). We conclude that the relative choice proportion of the similar alternative *T* will be reduced in comparison to the non-promotion setting. Accordingly, the postulated *NSE* is diminished. In total, hypothesis 2b states:

H2b: *In OOS situations of promoted phantoms the NSE diminishes.*

Additionally, scenarios are imaginable in which – instead of the preferred and unavailable option *S* – one of the remaining alternatives at the POS is offered on promotion (see Figure 4.3).

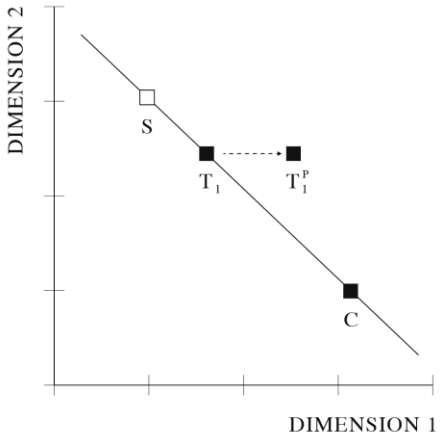


Figure 4.3.1:
Relatively Inferior Phantom

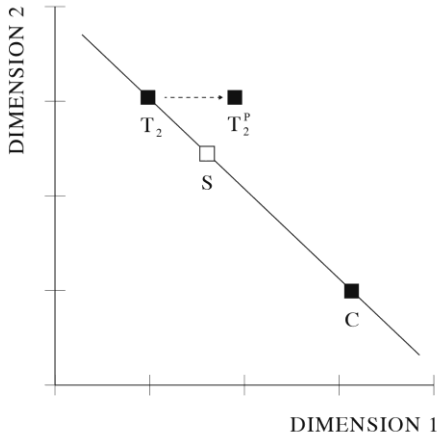


Figure 4.3.2:
Asymmetrically Dominated Phantom

Figure 4.3: Asymmetrically Dominated and Relatively Inferior Phantom

Let us assume that the most similar substitute *T* is offered at a reduced price, resulting in a rightward shift in the attribute space. Consequently the stocked-out item *S* takes the position of a relatively inferior or an asymmetrically dominated phantom, as it either demonstrates a worse trade-off than T_1^P or is dominated by T_2^P on both attribute dimensions respectively (see Figure 4.3.1 and Figure 4.3.2). Assuming that the phantom *S* serves as the customer's reference point to evaluate the available options (Heath et al., 2000), T_1^P represents a large gain on dimension one by losing only little on dimension two, whereas by switching from *S* to T_2^P, customers receive a gain on both considered attributes. In both cases, however, switching from *S* to the competing option *C* implies a large gain on dimension one accompanied by a simultaneous large loss on dimension two. Due to loss aversion and prospect theory, *C* thus appears less attractive resulting in an augmented choice probability of T_1^P and T_2^P respectively (Hedgcock et al., 2009; Tversky and Kahneman, 1991). Consequently, in both scenarios the choice probability of the most similar alternative *T* can be expected to increase disproportionately, resulting in a *NSE*. This effect can be expected to be even more

pronounced than for the non-promotional setting (cf., hypothesis 2a), since a switch from *S* to T_1^P or from *S* to T_2^P implies a better gain-loss-ratio than a switch from *S* to *T*. Summing up, we suggest:

H3a: *In OOS situations promotions of similar substitutes enforce the NSE.*

In the same vein, we can imagine one dissimilar or even very dissimilar substitute to be on promotion at the time the preferred product is temporarily unavailable. Figure 4.4 depicts the case when either competitor C_1 or competitor C_2 is offered at a reduced price causing a rightward shift of the respective item in the attribute space.

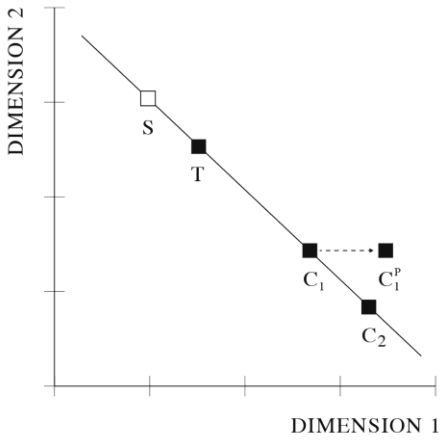


Figure 4.4.1:
Asymmetrically Dominated Decoy

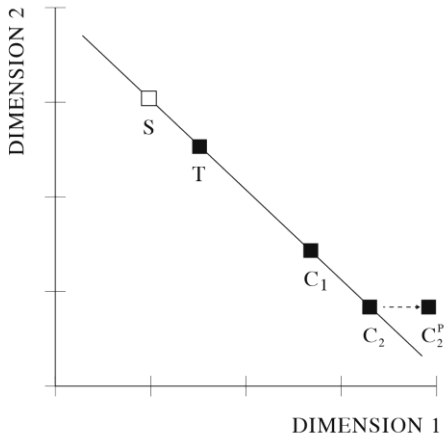


Figure 4.4.2:
Relatively Inferior Decoy

Figure 4.4: Asymmetrically Dominated and Relatively Inferior Decoy

If C_1 is on promotion, C_2 can be construed as an asymmetrically dominated decoy since it is dominated by C_1^P but not by any other alternative of the choice set (see Figure 4.4.1) (Huber et al., 1982). Here, C_2 represents a decoy and not a phantom since it is a selectable option. If C_2 is on promotion, option C_1 takes the place of a relatively inferior decoy in relation to C_2^P

as it exhibits a relatively worse trade-off on the considered attribute dimensions (see Figure 4.4.2) (Huber and Puto, 1983). Building on the fact that individuals use heuristics to facilitate decision making in new decision contexts (Bettmann, 1979), customers in these situations can be expected to substitute the unavailable with the promoted item since the cost of making decisions between dominated pairs is smaller than between non-dominated ones (Huber et al., 1982; Shugan, 1980). Thus, deciding between C_2 and C_1^P or C_1 and C_2^P is easier than between any of these options and *T*. That is why the choice probability of C_1^P and C_2^P can be assumed to increase disproportionately. This effect is known as the *attraction effect* (Huber et al., 1982) which can hence be assumed to offset or at least lower the *NSE* in the presented setting. Summing up, we hypothesize:

H3b: *In OOS situations promotions of dissimilar substitutes offset the NSE.*

4.3 Study 1

The primary purpose of study 1 was to contrast individuals' OOS responses and their respective substitution patterns for stock-outs of promoted versus non-promoted items. Owing to the fact that promotional activities influence customers' purchase behavior, we first tested the prediction that the behavioral reactions between both scenarios differed significantly (hypothesis 1a - hypothesis 1c). In the second part of the study, preference changes were considered and the existence of a *NSE* was examined for different product categories. Specifically, we wanted to demonstrate that choices of similar options are indeed more

probable than switching to dissimilar alternatives (hypothesis 2a). Yet, this phenomenon should be reduced for stock-outs of promoted items (hypothesis 2b).

4.3.1 Participants and Design

Data on OOS responses and substitution behavior was collected by a series of online experiments comprising between 451 and 1210 respondents per study. The participants were primarily students at a large university who were addressed during courses or via a university-wide mailing list. Four products were tested: two low involvement FMCG categories (detergent and orange-juice) and two high involvement categories (restaurants and hotels). We employed a 4 (detergent vs. orange juice vs. restaurant vs. hotel) x 2 (OOS item on promotion vs. OOS item not on promotion) pretest-posttest control group design with randomized group assignment. While the control group (CG) faced a stock-out during an average shopping situation, the experimental group (EG) was confronted with an OOS situation of a promoted item.

4.3.2 Procedure and Stimuli

Initially, in each experiment, test persons were faced with four fictitious brands that differed in price and quality (see Table 4.1). The four alternatives were constructed such that always two brands resembled each other and formed similar substitutes. Consequently, the choice sets consisted of two alternatives with a high quality-price combination and two alternatives with a rather low quality and low price. The four alternatives were non-dominating, that is, they were placed on the same trade-off line (see Figure 4.5).

	Experiment 1 Detergent (n = 451)		Experiment 2 Orange juice (n = 793)		Experiment 3 Restaurant (n = 878)		Experiment 4 Hotel (n = 1210)	
	Price[a]	*Quality*[b]	*Price*[c]	*Quality*[d]	*Price*[e]	*Quality*[f]	*Price*[g]	*Quality*[h]
Brand A	6.69€	90	1.28€	80	24€	8	120€	8
Brand B	5.99€	80	1.12€	70	21€	7	105€	7
Brand C	3.49€	50	0.80€	50	12€	4	60€	4
Brand D	2.85€	40	0.64€	40	9€	3	45€	3

[a] Price for 18 loads, [c] price per liter, [e] price per meal including one drink, [g] price per night, including breakfast
[b] Quality was operationalized by quality points awarded by a product test foundation with regard to cleaning power, color protection and ecological ingredients (100-highest quality, 0-lowest quality).
[d] Quality was operationalized by quality points awarded by a product test foundation with regard to flavor, fruit juice content, sugar content, no harmful substances (100-highest quality, 0- lowest quality).
[f] Quality Ranking (10-highest quality, 0- lowest quality).
[h] Quality was operationalized by quality points awarded by an evaluation portal with regard to cleanliness, location and surrounding area, facilities, service and staff (10-highest quality, 0- lowest quality).

Table 4.1: Initial Choice Sets

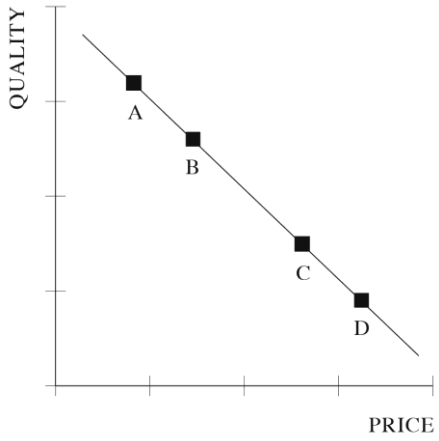


Figure 4.5: Initial Attribute Space

To test the hypotheses about OOS reactions and substitution behavior, we applied a three (two) stage approach for the low involvement FMCG categories (for the high involvement categories): In the first choice situation, test persons were asked to select their favorite brand (nominal choice) and to indicate a preference ranking for all four alternatives on a constant sum scale (ratio data). In the second situation, participants were confronted with a reduced choice set and informed that the item, which they selected in the first choice situation, was OOS and thus not available. The experimental groups additionally received the information

that their preferred product was on promotion but unfortunately already OOS. For detergent, the promotion package contained 10 additional loads, for orange juice and restaurants 20 percent discount were announced and in the hotel setting, the respective hotel was offered at a 15 percent discount. Due to the promotional reduction in price, the relative position of the OOS item changed. Consequently, in the experimental groups it took positions of asymmetrically dominating and relatively superior phantoms respectively (see Appendix 4.1).

Respondents who were assigned to the low involvement FMCG categories were then asked to state if they would react to the OOS situation by switching to one of the remaining brands, by leaving the store to buy their favorite brand in another shop of the same or a different retail chain or by postponing the purchase. Subsequently, they were again confronted with the reduced choice set and this time forced to substitute. Participants answering the questionnaire about the high involvement classes were directly requested to choose one of the remaining alternatives.

4.3.3 Results and Discussion

4.3.3.1 Manipulation Checks

To check the success of the randomized group assignment for each experiment, we compared the distribution of the preference products in the first decision task. The results showed that in all four categories the experimental and the control groups resembled each other with regard to the distribution of the preference product (see Table 4.2). A chi-square test confirmed the independence of the preference product and the assignment to the experimental groups ($\chi^2_{detergent}(3) = 1.519, p > .10$; $\chi^2_{orange\ juice}(3) = 1.536, p > .10$; $\chi^2_{restaurant}(3) = 1.238, p > .10$; $\chi^2_{hotel}(3) = 5.140, p > .10$). Accordingly, a possible bias could be precluded.

Experiment	Group	n	Brand A nominal (ratio)	Brand B nominal (ratio)	Brand C nominal (ratio)	Brand D nominal (ratio)
Experiment 1 (detergent)	Control Group	224	18.3% (22.86)	36.6% (34.09)	37.9% (30.33)	7.1% (12.71)
	Experimental Group	227	15.0% (20.61)	40.5% (35.50)	36.1% (31.81)	8.4% (12.08)
Experiment 2 (orange juice)	Control Group	336	52.4% (47.13)	33.6% (30.05)	10.7% (15.40)	3.3% (7.43)
	Experimental Group	457	49.5% (45.26)	33.5% (32.14)	13.3% (15.15)	3.7% (7.45)
Experiment 3 (restaurant)	Control Group	455	13.2% (18.44)	40.0% (36.29)	39.8% (33.00)	7.0% (12.26)
	Experimental Group	423	12.8% (17.67)	43.5% (34.92)	36.6% (34.72)	7.1% (12.69)
Experiment 4 (hotel)	Control Group	461	4.8% (9.41)	22.8% (23.35)	41.6% (35.51)	30.8% (31.73)
	Experimental Group	749	5.2% (9.31)	28.3% (27.03)	37.1% (34.32)	29.4% (29.33)

Table 4.2: Initial Choice (Preference Product, Study 1)

Additionally, we had to ensure that the allocated preference points for both the preference alternative as well as the respective similar substitute did not differ between the respective experimental and control groups. These points formed the basis to calculate the expected choice shares under the *IIA* assumption and should not be different in order to compare differences in substitution patterns in the second choice task statistically. A one-way ANOVA conducted on the allocated points for the preferred brand in all four experiments affirmed this precondition ($p > .10$). Furthermore, the independence of the experimental group and the initial preference ranking for the similar substitute was supported ($M^{CG}_{detergent} = 18.97$, $M^{EG}_{detergent} = 17.32$, $p > .10$; $M^{CG}_{orangejuice} = 17.15$, $M^{EG}_{orangejuice} = 18.54$, $p > .10$; $M^{CG}_{restaurant} = 16.41$, $M^{EG}_{restaurant} = 17.00, p > .10$; $M^{CG}_{hotel} = 17.16$, $M^{EG}_{hotel} = 16.77, p > .10$).

4.3.3.2 Behavioral Reaction Patterns

We first compared the differences in behavioral reaction patterns of the experimental groups and the respective control groups for each of the low involvement categories. A chi-square test of the nominal decisions was performed. The highly significant results for both categories ($\chi^2_{detergent}(3) = 23.729,\ p < .01$ *and* $\chi^2_{orange\ juice}(3) = 12.144,\ p < .01$) confirmed that responses to OOS situations differ considerably between promoted and non-promoted items. In comparison to the experimental groups, significantly more test persons of the control groups reacted by substitution. At the same time, a disproportionate number of test persons in the experimental groups decided to switch the outlet or to postpone the purchase.

The results of a one-way ANOVA conducted on the preference ratings for each reaction supported the result that participants of the promotion scenario distributed significantly less points to substitution than their non-promotional counterparts ($M^{CG}_{detergent} = 56.47$, $M^{EG}_{detergent} = 43.89,\ p < .01$; $M^{CG}_{orangejucie} = 64.35,\ M^{EG}_{orangejuice} = 59.54,\ p < .10$). Concurrently, those respondents allocated significantly more points to the reaction outlet switching ($M^{CG}_{detergent} = 7.13,\ M^{EG}_{detergent} = 13.32,\ p < .01$; $M^{CG}_{orangejucie} = 5.56,\ M^{EG}_{orangejuice} = 7.40,\ p < .10$) and tended to postpone the purchase ($M^{CG}_{detergent} = 28.33,\ M^{EG}_{detergent} = 35.54,\ p < .01$; $M^{CG}_{orangejucie} = 23.84,\ M^{EG}_{orangejuice} = 26.50,\ p > .10$). Hence, hypotheses 1a–1b are supported, hypothesis 1c is partly confirmed.

These outcomes indicate that the factor promotion exhibits a strong influence on behavioral reaction patterns in OOS situations. When faced with a stock-out for a non-promoted item, customers show a higher probability to substitute and a lower probability to switch the outlet and to postpone the purchase than in the promotion scenario. This finding demonstrates that customers undertake considerable efforts to take advantage of promotional

offers. In addition, outlet switching proves to be an important OOS reaction which has so far been missing in the OOS literature.

4.3.3.3 Substitution Patterns

To account for the existence of context-induced preference shifts and particularly, the occurrence of a *NSE*, the principle of *IIA* had to be disproved and significant differences between the observed and the expected choice shares needed to be demonstrated. For that reason, a paired sample t-test was conducted to compare the expected choice shares of the similar substitute (*SS*) under the Luce model ($E_L(SS)$) (for calculations see Appendix 4.2) to the respective observed choice shares ($O(SS)$). Table 4.3 illustrates that in each experiment and category the mean value of the expected choice shares for the similar substitute lies significantly below the respective observed shares ($M^{O(SS)}_{detergent} = 54.09$, $M^{E_L(SS)}_{detergent} = 45.43$, $p < .01$; $M^{O(SS)}_{orangejuice} = 73.83$, $M^{E_L(SS)}_{orangejuice} = 58.29$, $p < .01$; $M^{O(SS)}_{restaurant} = 58.63$, $M^{E_L(SS)}_{restaurant} = 49.26$, $p < .01$; $M^{O(SS)}_{hotel} = 64.09$, $M^{E_L(SS)}_{hotel} = 52.22$, $p < .01$). As the *NSE* is said to occur whenever the observed choice share of the similar substitute exceeds its expected choice share ($NSE = O(SS) - E_L(SS) > 0$), the existence of the *NSE* was confirmed across categories. Hence, hypothesis 2a is accepted. The findings prove that preferences in OOS situations shift contrarily to the assumptions of fixed preferences and proportionality. They instead change depending on the context.

	Experiment 1 (detergent)			Experiment 2 (orange juice)			Experiment 3 (restaurant)			Experiment 4 (hotel)		
	Whole Sample	Contr. Group	Exp. Group	Whole Sample	Contr. Group	Exp. Group	Whole Sample	Contr. Group	Exp. Group	Whole Sample	Contr. Group	Exp. Group
$M_{O(SS)}$	54.09	57.67	50.55	73.83	74.63	73.25	58.63	58.91	58.33	64.16	63.39	64.62
$M_{E_L(SS)}$	45.43	46.58	44.29	58.29	55.77	60.15	49.26	48.51	50.07	52.22	52.42	52.11
$NSE_{(SS)}$	**8.66**[1]	**11.09**	**6.26**	**15.54**	**18.86**	**13.10**	**9.37**	**10.40**	**8.26**	**11.94**	**10.97**	**12.51**
	t = 7.040, df = 450, p < .01	*F = 3.879, df = 1, p < .05*		*t = 14.923, df = 792, p < .01*	*F = 7.563, df = 1, p < .01*		*t = 9.546, df = 877, p < .01*	*n.s.*		*t = 13.614, df = 1209, p < .01*	*n.s.*	

[1] figures in bold indicate that the effect is significant at $p < .01$and in the expected direction

Table 4.3: Observed versus Expected Choice Shares

In the next step, the diminishment of the *NSE* for the experimental groups had to be shown. To test this prediction, the strength of the *NSE* was calculated for both the control and the experimental groups and compared by means of a one-way ANOVA (see Table 4.3). For the low involvement FMCG categories, the mean of the *NSE* of the control groups lay significantly above the respective effect for the experimental groups ($NSE^{CG}_{detergent} = 11.09$, $NSE^{EG}_{detergent} = 6.26$, $p < .05$; $NSE^{CG}_{orangejuice} = 18.86$, $NSE^{EG}_{orangejuice} = 13.10$, $p < .01$). Consequently, hypothesis 2b is supported for this type of goods. By contrast, the outcomes revealed a different substitution behavior for the two high involvement goods: restaurants and hotels. Here, the proposed reduction of the *NSE* was not observable. The difference in the mean value of the *NSE* of both groups was not significant ($NSE^{CG}_{restaurant} = 10.40$, $NSE^{EG}_{restaurant} = 8.26$; $p > .10$, $NSE^{CG}_{hotel} = 10.97$, $NSE^{EG}_{hotel} = 12.51$, $p > .10$). Apparently, consumers of high involvement products tend to switch to similar products if their preferred alternative is temporarily unavailable, regardless of whether the initially preferred OOS item is announced to be on promotion or not. A possible explanation for this is the elevated perceived risk in purchase decisions for restaurant visits and hotels as those products are relatively costly and other people are affected by the decision outcome (Houston and

Rothschild, 1978). Since customers are known to engage in risk-reducing techniques to minimize the perceived risk in purchase situations (Dowling and Staelin, 1994), they tend to switch to a very similar substitute when a formerly preferred high involvement product is unavailable. That way, the risk of making a wrong decision can be minimized. In contrast, repeated purchase decisions for FMCGs are known to have a low involvement level and only bear a small risk of mispurchase (Hoyer, 1984). Hence customers more easily switch to dissimilar substitutes to replace the unavailable item.

Summing up, it is shown that customers' substitution patterns in OOS situations are context-dependent and change subject to the relative positions of the phantom. Specifically, the findings demonstrate that preference shifts correspond to a strong *NSE* as long as the available alternatives do not obviously dominate each other. Yet, when the relative dominance structure is changed due to a promotion-induced alteration in price, customers are less inclined to choose the most similar substitute in FMCG low involvement categories. The probability of switching to the unalike alternative moves closer to the probability of switching to the similar alternative. Apparently, dominating options rupture decision heuristics leading customers to reconsider their habitual choices and switch to options which do not correspond to the formerly exhibited preference structure. However, in OOS situations of high involvement goods, customers tend to switch to the most similar substitute regardless of a promotional offer in an attempt to minimize the perceived risk of mispurchase.

4.4 Study 2

Study 2 was conducted to test our hypotheses 3a and 3b and extend the findings of study 1 in two important ways: First, we wanted to demonstrate that the *NSE* is existent and even

enforced if a similar substitute is promoted. Second, the study should provide evidence for the proposed disappearance of the *NSE* if dissimilar substitutes are offered on promotion due to the simultaneous appearance of an attraction effect.

4.4.1 Participants and Design

In total, 1624 undergraduates of a large university participated in this online experiment in exchange for entry into a lottery with a prize of three Ipod shuffles. Two online questionnaires were distributed that only differed with regard to the analyzed product category (detergent and hotels). We applied a different experimental setting than in study 1, in which not the initially preferred and unavailable item was announced to be on promotion but one of the other still selectable alternatives. Consequently, three scenarios could be distinguished: the similar substitute (SS), the far substitute (FS) or the extreme substitute (ES) being on promotion. Participants were randomly assigned to one of the six conditions in a 2 (detergent vs. hotel) x 3 (SS vs. FS vs. ES) pretest-posttest design.

4.4.2 Procedure and Stimuli

The experiment used an analogous procedure to the first study, yet with a modification of the second choice task. Participants first made choices in four-item choice sets described with the two attributes quality and price (see Table 4.1) and allocated preference points on a constant sum scale. Next, they were confronted with a reduced choice set in which the preferred alternative was again tagged OOS. Depending on the experimental condition, participants additionally were informed that the similar substitute, the far substitute or the extremely far substitute was on promotion. For detergent, the promotion package contained 10 additional loads, while in the hotel setting, the respective hotel was offered at a 15 percent discount.

In each experimental condition, the relative position of the respective promoted item changed in the attribute space. In contrast to the first study, the phantom position was not altered. However, the dominance structure of the remaining alternatives shifted subject to the preferred item and the experimental condition (see Appendix 4.3). If the similar substitute was on promotion, the promoted alternative was either construed an asymmetrically dominating or a relatively superior item. Though, if one of the dissimilar options was offered at a reduced price, these options became superior to all remaining alternatives.

4.4.3 Results and Discussion

4.4.3.1 Manipulation Checks

To test the predictions about differences in substitution behavior, we needed to verify the independence of the experimental groups with regard to their initial preference structure. As required, the nominal choice in the first decision situation did not deviate among the three conditions in both categories ($\chi^2_{detergent}(6) = 2.922, p > .10$; $\chi^2_{hotel}(6) = 7.246, p > .10$, see Table 4.4). A one-way ANOVA on the allocated preference points was performed and supported this notion ($p > .10$).

Experiment	Group	n	Brand A nominal (ratio)	Brand B nominal (ratio)	Brand C nominal (ratio)	Brand D nominal (ratio)
Experiment 5 (detergent)	SS	438	13.7% (19.70)	37.2% (32.88)	40.0% (32.05)	9.1% (15.37)
	FS	260	11.5% (18.21)	37.3% (34.17)	39.2% (31.98)	11.9% (15.63)
	ES	262	15.3% (22.47)	37.0% (32.20)	38.5% (30.66)	9.2% (14.67)
Experiment 6 (hotel)	SS	235	3.8% (11.88)	31.9% (29.71)	40.0% (32.55)	24.3% (25.85)
	FS	230	3.5% (11.26)	36.1% (29.58)	34.3% (31.68)	26.1% (27.47)
	ES	190	7.4% (15.57)	30.5% (28.09)	33.7% (28.78)	28.4% (27.55)

Table 4.4: Initial Choice (Preference Product, Study 2)

In addition, the mean values of the distributed preference points for the similar alternative were comparable in five out of six scenarios. In the detergent category, each of the three groups did not deviate from each other with regard to the allocated points ($M^{SS}_{detergent} = 16.17$, $M^{FS}_{detergent} = 16.93$, $M^{ES}_{detergent} = 17.43$, $p > .10$). In the hotel category, however, a one-way ANOVA revealed that the mean values of the preference points distributed by the three groups differed ($M^{SS}_{hotel} = 18.31$, $M^{FS}_{hotel} = 18.30$, $M^{ES}_{hotel} = 21.13$, $p < .10$). A subsequent Duncan's test indicated that M^{SS}_{hotel} and M^{FS}_{hotel} resembled each other statistically whereas M^{ES}_{hotel} differed significantly from both other groups ($M^{SS}_{hotel} = 18.31$, $M^{FS}_{hotel} = 18.30, p > .10$).

4.4.3.2 Substitution Patterns

Table 4.5 summarizes the expected and the observed choice shares of the similar, far and extreme substitutes for the whole sample and the three subgroups (with the similar substitute, far substitute or extreme substitute on promotion) for both categories. Looking at the case when the similar substitute was on promotion, the results of the applied paired-sample t-test demonstrated that for both product groups the observed choice shares of the similar product lay significantly above the expected choice shares under the *IIA* assumption ($M^{O(SS)}_{detergent} = 69.86$, $M^{E_L(SS)}_{detergent} = 44.33$, $p < .01$; $M^{O(SS)}_{hotel} = 73.07$, $M^{E_L(SS)}_{hotel} = 50.41$, $p < .01$), pointing to a significant *NSE*. The descriptive comparison of the strength of the *NSE* between $SS_{detergent}$ and SS_{hotels} with the respective results $CG_{detergent}$ and CG_{hotels} of study 1 revealed that the *NSE* is substantially larger in situations when the respective similar substitute is on promotion than for non-promotional settings ($NSE^{CG}_{detergent} = 11.09$, $NSE^{SS}_{detergent} = 25.53$; $NSE^{CG}_{hotel} = 10.97$, $NSE^{SS}_{hotel} = 22.66$). Consequently, hypothesis 3a is confirmed.

		Experiment 1 (detergent)				Experiment 2 (hotels)			
		Whole sample	**SS[a]**	**FS[b]**	**ES[c]**	**Whole sample**	**SS[a]**	**FS[b]**	**ES[c]**
$M_{O(SS)}$		56.59	69.86	40.34	50.55	61.63	73.07	52.75	58.24
$M_{E_L(SS)}$		44.45	44.33	42.68	46.41	52.29	50.41	50.97	56.23
$NSE_{(SS)}$	$O(SS) - E_L(SS)$	**12.14**[1]	**25.53**	-2.34[ns]	4.14	**9.34**	**22.66**	1.78[ns]	2.01[ns]
		t = 11.543, df = 959, p < .01	*t = 17.653, df = 437, p < .01*	*t = -1.222, df = 259, p > .10*	*t = 2.296, df = 261, p < .05*	*t = 8.578, df = 654, p < .01*	*t = 12.353, df = 234, p < .01*	*t = 1.056, df = 229, p > .10*	*t = 1.157, df = 189, p > .10*
$M_{O(FS)}$		31.51	23.00	53.48	23.91	28.52	21.20	40.97	22.52
$M_{E_L(FS)}$		38.54	38.25	42.69	34.91	35.18	36.56	36.66	31.69
$AE_{(FS)}$	$O(FS) - E_L(FS)$	-7.03	-15.25	**10.79**	-11.00	-6.66	-15.36	**4.31**	-9.17
		t = -7.517, df = 959, p < .01	*t = -12.492, df = 437, p < .01*	*t = 5.663, df = 259, p < .01*	*t = -7.172, df = 261, p < .01*	*t = -6.843, df = 654, p < .01*	*t = -10.146, df = 234, p < .01*	*t = 2.826, df = 229, p < .01*	*t = -5.224, df = 189, p < .01*
$M_{O(ES)}$		11.80	6.92	6.17	25.54	9.85	5.74	6.29	19.24
$M_{E_L(ES)}$		17.01	17.42	14.62	18.68	12.52	13.04	12.37	12.08
$AE_{(ES)}$	$O(ES) - E_L(ES)$	-5.21	-10.50	-8.45	**6.86**	-2.67	-7.30	-6.08	**7.16**
		t = -7.447, df = 959, p < .01	*t = -13.106, df = 437, p < .01*	*t = -7.917, df = 259, p < .01*	*t = 4.041, df = 261, p < .01*	*t = -3.747, df = 654, p < .01*	*t = -7.504, df = 234, p < .01*	*t = -6.944, df = 229, p < .01*	*t = 4.292, df = 189, p < .01*

[a] Similar substitute (SS) on promotion
[b] Far substitute (FS) on promotion
[c] Extreme substitute (ES) on promotion
[ns] not significant
[1] figures in bold indicate that the effect is significant at $p < .01$ and in the expected direction

Table 4.5: Observed versus Expected Choice Shares (SS, FS and ES with Rotating Promotion Product)

However, when either the far substitute or the extreme substitute was on promotion, the results indicated that the expected and the observed choice shares of the similar substitute did not differ or only differed marginally. Accordingly, no *NSE* ($NSE^{FS}_{detergent} = -2.34,\ p > .10$; $NSE^{FS}_{hotel} = 1.78,\ p > .10$; $NSE^{ES}_{hotel} = 2.01,\ p > .10$) or only a small *NSE* ($NSE^{ES}_{detergent} = 4.14,\ p < .05$) could be found, affirming hypothesis 3b. Looking at the choice shares of the promoted far and extreme brand, it became obvious that an attraction effect (*AE*) dominated the *NSE* as the promoted products gained choice share disproportionately while the respective dominated alternatives lost choice share above average. The *AE* was significant across

categories and throughout all scenarios ($AE^{FS}_{detergent} = 10.79$, $p < .01$; $AE^{ES}_{detergent} = 6.86$, $p < .01$; $AE^{FS}_{hotel} = 4.31$, $p < .01$; $AE^{ES}_{hotel} = 7.16$, $p < .01$), leading to the disappearance of the *NSE* and an approval of hypothesis 3b.

Study 2 gives further proof of the empirical fact that brand and product choices are driven by promotional offers (Blattberg and Jeuland, 1981). The study, however, extends the findings to situations when the preferred item is temporarily unavailable and individuals are forced to choose a substitute out of the remaining alternatives. The results suggest that in OOS situations of the preference product, the promotion of a similar substitute enhances its choice probability, giving new evidence of preference shifts according to a *NSE*. If a dissimilar item is offered at a reduced price, this *NSE* is, however, offset by the simultaneous occurrence of an attraction effect which results from the altered dominance structure between the available substitutes. Consequently, the choice share of the similar substitute increases in accordance to the assumptions of classical economic theory, whereas the promoted product (which now holds a dominating position in the attribute space) can increase its choice share disproportionately.

4.5 Discussion and Implications

In summary, our analysis detects specific differences in OOS responses and substitution patterns for promoted and non-promoted items. As previous OOS studies have already shown, customers in OOS situations generally exhibit a high tendency to substitute unavailable items for other products within the assortment (Campo et al., 2004; Dadzie and Winston, 2007; Verbeke et al., 1998). However in our study, this response behavior turns out to be more clearly pronounced for customers in ‘average’ OOS situations. Customers who encounter

stock-outs for promoted items more frequently postpone their purchases or change to another outlet of the same retail chain to buy the promoted product. Those customers seem to behave both brand and store loyal, as they neither switch the brand nor the retailer but undertake considerable effort to get the preferred brand within the promotional offer.

Our research makes several key contributions to the marketing literature. Firstly, the results demonstrate the relevance of promotion as an essential driver for specific OOS reaction behavior. This is especially important as the OOS rates for promoted items are in general higher (ECR Europe and Roland Berger, 2003). Since OOS research has so far neglected the influence of promotion, previous implications have to be adapted. Secondly, we extend OOS research by adding outlet switching as an additional reaction possibility. This reaction turns out to be a meaningful response, in particular for promoted OOS items. Thirdly, we successfully relate assumptions of context and phantom theory to OOS reactions by testing the similarity substitution hypothesis and proving the existence of the *NSE* contrary to the assumed preference shifts in classical economic theory. We further reveal and account for different magnitudes of this phenomenon. Thereby we supply a theoretical framework to OOS research.

4.5.1 Theoretical Implications

The current research extends the knowledge on OOS effects, context-induced preferences and phantom theory by uncovering a new explanation of OOS-induced preference shifts and including promotion as an important driver. The existing literature has largely focused on the behavioral responses in OOS situations incorporating substitution as an essential reaction. The present research contributes to the understanding of the substitution process. Our findings suggest that OOS-induced preference shifts significantly deviate from the assumed preference shifts of classical decision theory. Specifically, we reveal that choice shifts depend on the

relative position of the respective unavailable item. Study 1 illustrates that in 'average' OOS situations with non-dominating choice options, substitution patterns correspond to a *NSE* in that customers primarily choose substitutes which resemble the formerly chosen preference product based on the considered attributes. This behavior is robust for all covered product categories and can be interpreted as customers' attempts to simplify the decision process and minimize the possible risk of mispurchase (Breugelmans et al., 2006). However, our results indicate that for stocked-out low involvement products on promotion, the *NSE* is diminished since customers significantly less often choose a similar substitute but consider the choice of an unalike product. Due to promotional price reductions, the dominance structure between the phantom and the remaining alternatives is altered. The promoted but unavailable item dominates the similar and available alternative, whereby it is perceived as being less attractive (Highhouse, 1996; Simonson, 1989). Consequently, its choice gets harder to justify. That is why consumers re-evaluate the available alternatives and more often opt for products which are not evidently dominated. However, for high involvement products, the diminishment of the *NSE* is not found. As deciding on high involvement products includes far-reaching consequences and a higher risk of mispurchase (Antil, 1984), individuals prefer switching to the most similar option regardless of whether the favored option was on promotion. Another important point is considered in study 2: We extend literature by exploring the influence of promoted substitutes when preferred brands are OOS. Past research on the impact of sales promotion has largely revealed that the vast majority of sales increases are due to brand switching (Van Heerde et al., 2003). Our results provide evidence that promotion of similar substitutes leads to an increased *NSE* in OOS situations as the similar substitute becomes a clearly dominating option. If instead a dissimilar alternative is offered at a reduced price, the *NSE* is offset due to shifts in relative positions of the remaining options in the choice set. This outcome is in line with our prediction derived from extant literature on the context-

dependence of choice. The promoted brand is asymmetrically dominating or relatively inferior to the other dissimilar alternative and, according to the well-established phenomenon of an attraction effect, increases its relative choice share disproportionately. Consequently, the *NSE* is inhibited in such scenarios.

Overall, our results suggest innovative ways for marketers to apply theory on context and phantom effects to explain and predict preference formation and choice behavior in situations of stock-out induced reductions of choice sets. It is restated that substitution decisions are context-dependent. As promotional offers change the decision context by altering the relative positions of the OOS item and the available alternatives, respectively, those offers significantly influence substitution decisions and can be used to direct individuals' preferences and choices in situations of unavailability.

4.5.2 Managerial Implications

The managerial implications of our findings are twofold. For the manufacturer, we find that OOS situations may imply severe damages since customers willingly decide to substitute within the remaining alternatives if the formerly preferred brand is temporarily unavailable. This way, the manufacturer not only loses margins in the short run but also bears the risk of losing possibly loyal customers to competing brands in the long run. Although a large part of OOS-affected customers decide to postpone the purchase, it remains unclear if those customers will return to the unavailable brand during their next shopping occasion. For stock-outs of promoted items, customers are less inclined to substitute and tend to follow the promoted brand into different outlets. However, this finding indicates that customers are bargain hunters that only behave brand loyal when they expect financial compensation. Manufacturers have to question the value of those customers as they can be expected to easily

switch to a competing brand if it happens to be on promotion. This behavior is actually demonstrated by the results of our second study.

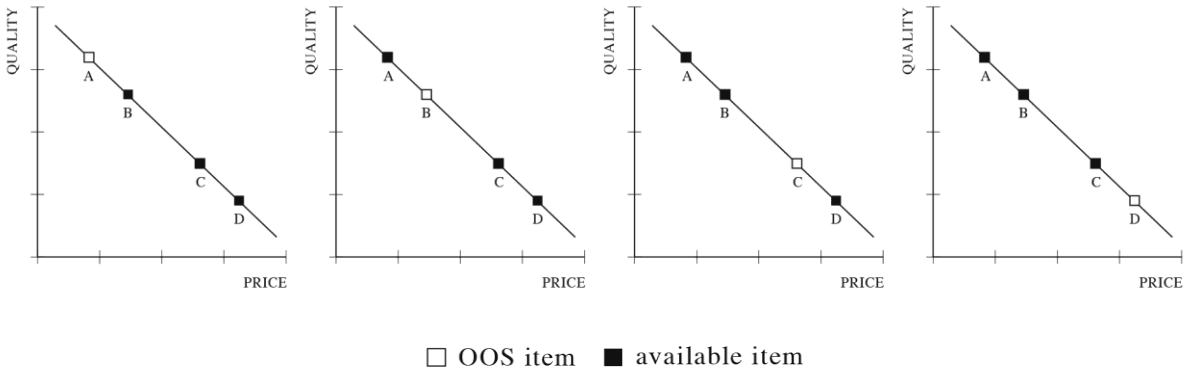
For the retailer, on the other hand, our general results suggest fewer damages as the majority of OOS-affected customers decide to choose a substitute and only a small fraction switch the store. However, if the unavailable brand is offered on promotion, they significantly less often substitute within the retail chain and postpone their purchases with a higher probability. This behavior may result in lost margins for the retailer in the short run. By contrast, the newly introduced reaction 'outlet switching' proves to be especially relevant since a significantly higher proportion of customers in OOS situations for promoted items voluntarily visit another outlet of the same retail chain to profit from the promotional offer. This finding suggests that financial savings are a more relevant customer need than the disposability of products. With regard to substitution patterns, our results indicate that customers substitute in accordance to a *NSE*. This implies that retailers should always stock at least two similar products to facilitate substitution decisions in OOS situations. In addition, our findings evidence that retailers can guide brand and item choice in OOS situations by the systematic use of promotional activities. This, in turn, may offer an opportunity to strengthen their own private labels. As typically private labels are perceived to be very dissimilar to manufacturer brands with regard to the discussed dimensions quality and price (Bellizzi et al., 1981; Richardson et al., 1994), they should be offered on promotion if a manufacturer brand is OOS. Moreover, shops that only offer their own labels can re-direct purchases from top-selling to slow-selling articles, for instance at the end of seasons, to deplete the remaining stocks. This might be especially relevant for e-retailers who can easily guide the substitution process by targeted suggestions of promoted substitutes (Breugelmans et al., 2006). Thus sales of dead articles can be enhanced. Online as well as offline tour operators can moreover use our findings to successfully exploit the allotments for their offered hotel assortment.

4.5.3 Limitations and Future Research

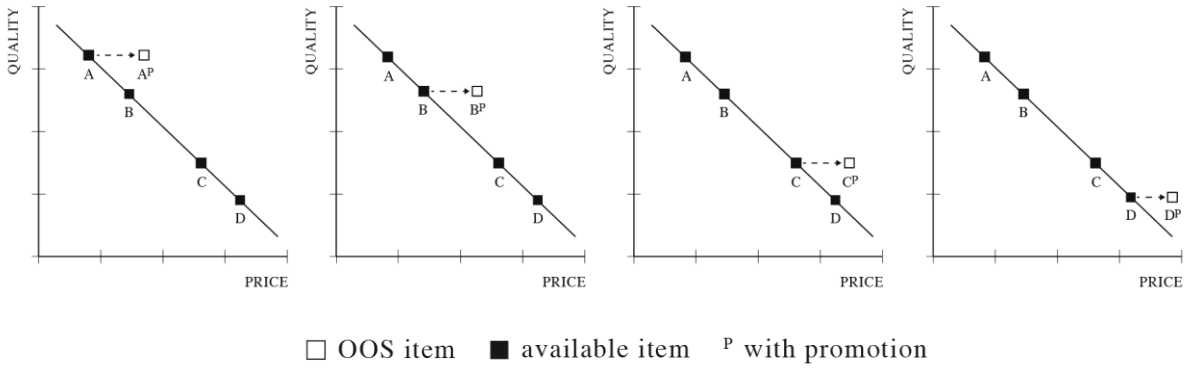
Despite the valuable contributions, our research is limited by several aspects which open avenues for further research. We test our hypotheses in four product categories and on the basis of reported behavior. This may decrease the external validity of our results as test persons might have had difficulties putting themselves into the fictitious OOS situation. Although this data collection method has several advantages (e.g., minimization of white noise) and has been applied by previous OOS and context studies, further research has to generalize the results by examining more categories and in a real-world shopping situation. This could be of particular interest in online shopping environments where demand is highly fluctuating (Rayport and Jaworski, 2001) and stock-outs are ineluctable. As customers face smaller switching and information costs, they can be expected to exhibit different substitution patterns than in brick-and-mortar settings (Dadzie and Winston, 2007). Moreover, our study only considers short-term OOS reactions. However, the assessment of permanent OOS-induced responses seems very interesting as damages to store and brand loyalty can only be recognized in the long-run and possibly after several OOS occasions. Since promotion proves to be an important driver of OOS responses, more research should be done to further analyze its influence. Finally, by combining research on context-dependent preferences and phantom alternatives, the study offers ample opportunities to further analyze prevailing context effects in situations of reduced choice set by varying the position of the unavailable product to test the potential effects on preference formation and choice decisions. Here, another interesting direction to pursue would be the analysis of so-called N-phantoms (Gierl and Eleftheriadou, 2005), which differ from the alternatives of the core choice set on a third dimension and might provoke distinct reaction and substitution patterns. One further issue worth investigating is how different reasons for the unavailability of the promoted product influence OOS reaction

and the respective substitution behavior. Here, it would be imaginable to contrast OOS responses for stock-outs resulting from high and unforeseen demand with those that are the consequence of intended bait-and-switch techniques. Different psychological constructs like reactance (Brehm, 1966) or an increase in attractiveness (Gea et al., 2009) could be used to further explain the findings.

Appendix



Appendix 4.1.1: Control Group



Appendix 4.1.1: Experimental Group

Appendix 4.1: Preference Brands as Phantom Alternatives (Study 1)

$$E_L(SS) = \frac{O_1(SS)}{\sum_{n=1}^{2} O_1(DS_n)} \cdot O_1(P) + O_1(SS)$$

with

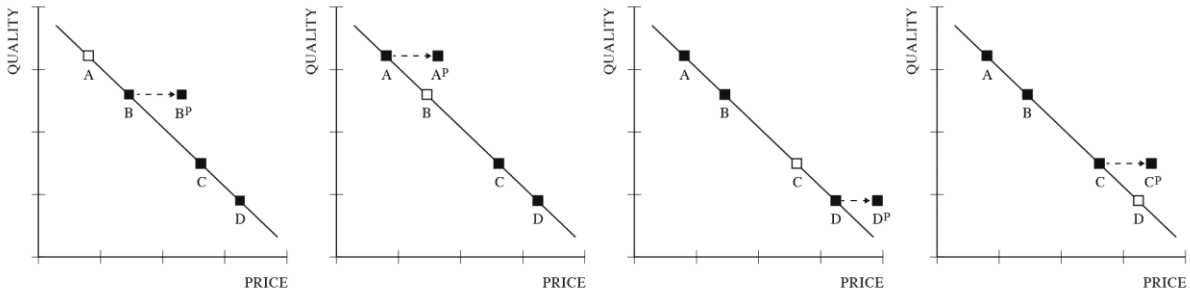
$E_L(SS)$ - expected choice share of the similar substitute under the Luce Model in the second decision situation (P is out-of-stock),

$O_1(SS)$ - observed choice share of the similar substitute in the first decision situation,

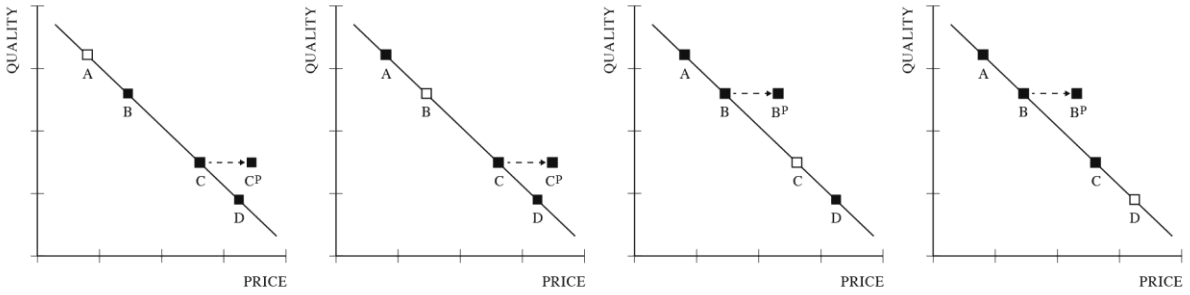
$O_1(DS_n)$ - observed choice share of the dissimilar substitute n in the first decision situation, n=(1,2),

$O_1(P)$ - observed choice share of the preference product in the first decision situation.

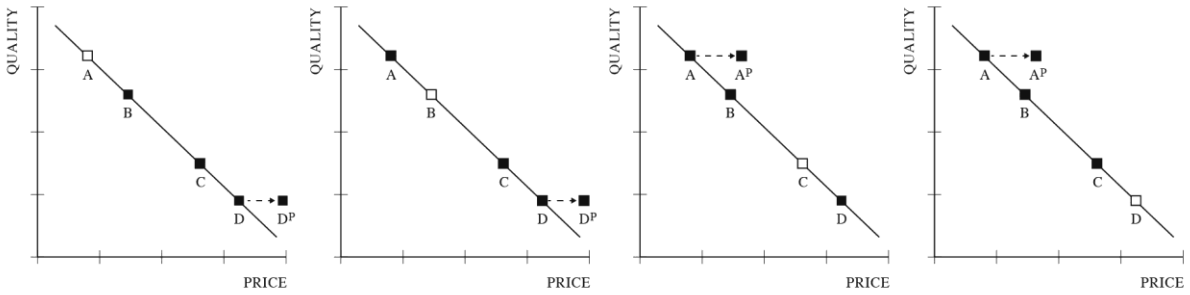
Appendix 4.2: Expected Choice Shares under the Luce Model



Appendix 4.3.1: Similar Substitute on Promotion



Appendix 4.3.2: Far Substitute on Promotion



Appendix 4.3.1: Extreme Substitute on Promotion

Appendix 4.3: Promotion-Induced Shifts in the Attribute Space (Study 2)

5 ANTECEDENTS OF THE NEGATIVE ATTRACTION EFFECT: AN INFORMATION-PROCESSING APPROACH

Wiebach (2011)

Working Paper

ABSTRACT

This research replicates and extends several elements of the study by Mishra et al. (1993) on the antecedents of the widely discussed attraction effect for product introductions, while focusing on the so far neglected inversed scenario of product exit. This study provides the first empirical consideration of the influencing factors of a *negative attraction effect* which describes the disproportionate lower increase in a target's choice probability after the removal of an inferior decoy. Specifically, the results of a causal model emphasize decoy share, preference strength and information relevance as major drivers of the considered phenomenon and yield rich insights to retailers and brand managers.

5.1 Introduction

In real markets, retailers' or manufacturers' decisions to introduce or delete brands result in varying choice sets. Following the classical model of rationality, consumer preferences and decisions should be independent of the composition of a choice set. Accordingly, a not-considered option cannot become a favored one when new items are added and the removal of an item should lead to a proportionate preference increase among the remaining options (Luce, 1959).

In contrast, extensive research on consumer decision-making has provided clear evidence that context – defined as the composition of the choice set (Tversky and Simonson, 1993) – matters and influences preferences substantially (Payne et al., 1992; Slovic, 1995; Tversky et al., 1988). One well-documented and widely verified phenomenon is the attraction effect (Heath and Chatterjee, 1995; Huber et al., 1982; Kim et al., 1999; Pan and Lehmann, 1993; Simonson, 1989; Simonson and Tversky, 1992). The attraction effect denotes an inferior product's ability to increase the attractiveness of a similar, but superior, target alternative when the inferior product is added to the original choice set (Huber and Puto, 1983; Huber et al., 1982). Typically, the introduced inferior product is referred to as a decoy. It is dominated by the target but not by the competitor option and alters the choice probabilities and preferences among the two core alternatives shifting preferences to the target. Numerous studies have demonstrated that this phenomenon leads to violations of basic economic choice principles, such as regularity (Luce, 1977) and the principle of independence of irrelevant alternatives which assumes that preference between alternatives should not depend on the presence or absence of additional alternatives (Tversky and Simonson, 1993). There are different explanations for the favorable perception of similar but superior

alternatives such as simplifying choice heuristics (Huber and Puto, 1983), range frequency theory (Parducci, 1974), justification of choice (Simonson, 1989) and tradeoff contrast (Simonson and Tversky, 1992). The study of Mishra and colleagues builds on these findings and provides an overall model to test the effect of various antecedents from the field of decision-making on the attraction effect (Mishra et al., 1993).

The purpose of my research is to replicate and extend their study by testing the conceptual model for market exit. In contrast to the introduction of new products, the impact of removed items on preferences has so far not attracted much interest. However, the deletion of inferior items represents a prevalent instrument in marketing practice, for instance, since the majority of new products fail. The managerial significance is further notable for retailers deciding on the delisting of brands or brand managers intending to restructure or reduce their brand portfolio. Sivakumar and Cherian (1995) as well as Wiebach and Hildebrandt (2011) covered this problem and demonstrated that for a market exit of an asymmetrically dominated decoy, the target brand will lose its dominant position and will consequently be considered relatively less attractive. The relative decrease in the target's choice probability is designated the *negative attraction effect*.

The article employs the conceptual basis of Mishra et al. (1993) and provides insights regarding the potential influential factors for the *negative attraction effect* to better predict consumers' choice behavior when items are eliminated from a choice set. The hypotheses are tested by estimating a structural equation model with survey data at an individual level.

The current study contributes to marketing literature by examining various antecedent variables of the *negative attraction effect*. An improved understanding of the phenomenon and its influencing factors will help consumer researchers to devise choice experiments more precisely, i.e. to control for important factors in the choice task and to take them into account when evaluating the magnitude of the effect. For marketers, this study delivers valuable

insights on the utilization of the *negative attraction effect* to forecast and control customers brand choice in situations when items are removed from the market. Retailers can employ the findings to predict the consequences of a delisting strategy or an out-of-stock situation, brand manufacturers can adopt the results when deciding on the reduction of their product portfolios.

In what follows, I briefly review the relevant research and describe the theoretical basis on the processes that affect the *negative attraction effect*. The details in respect of the included constructs are then discussed, hypotheses on their relations to the *negative attraction effect* are derived and the causal model framework is presented. Next I report on an empirical study that provides empirical support for the derived hypotheses. The article concludes with a discussion of the current findings in light of related literature and implications of the present research.

5.2 Conceptual Framework

5.2.1 Overview

Research on consumer choice and preference formation has revealed different moderating variables which have a significant impact on decision making (Alba and Hutchinson, 1987; Bettman, 1986; Cohen and Chakravarti, 1990). Accordingly, Mishra et al. (1993) suggest that the attraction effect is an outcome of different processes of decision making which depend on the decision task, the respondents, and the considered alternatives when new brands are introduced into a choice set. Due to the complexity of consumers' decision processes and the interactions of the related factors, they propose and test a causal model. The current research

is based on their conceptual framework but emphasizes the market exit case and accordingly, the antecedents of the *negative attraction effect*.

5.2.2 Negative Attraction Effect

Refering to Sivakumar and Cherian (1995) the attraction effect is negative "…if the target loses share due to the exit of another product" (Sivakumar and Cherian, 1995, p. 46). This observed phenomenon is contrary to several standard principles applied in choice modeling and the predicted preference shifts in classical economic theory (e.g., regularity and proportionality (Luce, 1959)). The initial choice set for the product exit scenario consists of three options: the target *T*, the competitor *C* and the asymmetrically dominated decoy *D*. As typically assumed in attraction effect research, the alternatives differ on two attributes (see Figure 5.1). Due to the presence of the decoy, the target is considered as being more attractive (Huber and Puto, 1983; Huber et al., 1982). If the decoy is removed from the choice set, the target loses its dominant position and its attractiveness is reduced. Hence, a *negative attraction effect* results, i.e. the probability of choosing the previously dominating alternative T will not rise or only rise disproportionately: $\frac{P(T|\{T,C\})}{P(C|\{T,C\})} < \frac{P(T|\{T,C,D\})}{P(C|\{T,C,D\})}$.

The following analysis will reveal the factors which influence the strength of the phenomenon by developing and estimating a holistic model.

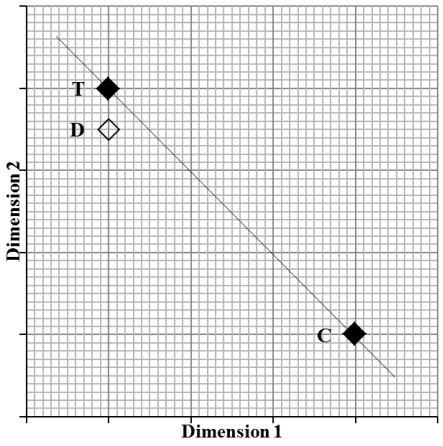


Figure 5.1: The Negative Attraction Effect

5.2.3 The Lisrel Model

Drawing on the work of Mishra et al. (1993), the conceptual model underlying this research is exhibited in Figure 5.2 taking into consideration the proposed antecedents of the *negative attraction effect* as well as interrelationships between the other constructs. According to the Lisrel approach (Jöreskog, 1969; Jöreskog and Sörbom, 1982, 1984, 1996), the formal specification of the proposed model is described by the following matrix equations:

$$\eta = B\eta + \Gamma\xi + \zeta, \qquad (1)$$

$$y = \Lambda_y\eta + \varepsilon, \qquad (2)$$

$$x = \Lambda_x\xi + \delta, \qquad (3)$$

where equation *(1)* represents the structural equation model, i.e. the relationship between m latent endogenous variables η and the n latent exogenous constructs ξ. ζ is the vector of random residuals. Equation *(2)* specifies the measurement model of the latent endogenous variables, and equation *(3)* the measurement model of the latent exogenous variables. Λ_y and

Λ_x are factor loading matrices and ε and δ denote vectors of the respective measurement errors. Indicators of exogenous constructs are symbolized as $x=(x_1,...,x_{11})$ and those of endogenous constructs as $y=(y_1,...,y_{11})$. γs indicate the path coefficients between exogenous and endogenous constructs and βs the relationships between the endogenous constructs.

In the suggested Lisrel model representing the determinants of the *negative attraction effect* (see Figure 5.2) exogenous constructs are composed of expertise (*EXP,* ξ_1), perceived decoy similarity (*SIM,* ξ_2), perceived decoy popularity (*POP,* ξ_3) and preference strength (*PRE,* ξ_4).[12] The endogenous constructs comprise task involvement (*INV,* η_1), information relevance (*INF,* η_2), decoy share (*DS,* η_3), and *negative attraction effect* (*NAE,* η_4). Direct paths leading to the *negative attraction effect* construct describe the hypotheses which are discussed in detail in the subsequent section.

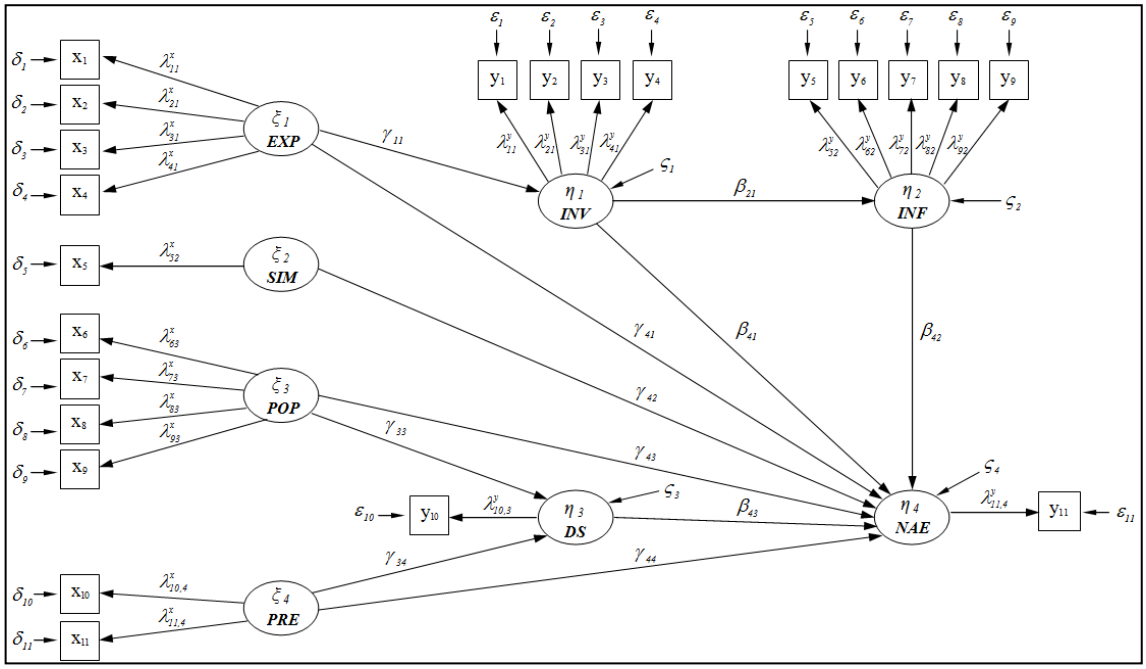


Figure 5.2: Causal Model for the Negative Attraction Effect

[12] Against the basic model of Mishra et al. (1993), familiarity is not included as exogenous construct in the presented model due to a lack of validity of the underlying measurement model.

5.2.4 The Antecedent Variables and Hypotheses

5.2.4.1 Expertise

Alba and Hutchinson (1987, p. 411) defined expertise as "… the ability to perform product-related tasks successfully". Expertise facilitates the assimilation of contextual information in interpreting brands (Meyers-Levy and Sternthal, 1993; Yi, 1993). People with higher expertise levels easier take decisions than inexperienced individuals with minor knowledge about the product category. They include their experiences when selecting an alternative from a presented choice set (Metha et al., 2011). Consequently, these people exhibit a clear preference structure and the influence of a removed decoy should be marginal giving rise to a reduced *negative attraction effect*.

H1: Respondents with a higher level of product class expertise exhibit a lower negative attraction effect.

5.2.4.2 Perceived Decoy Similarity

In their empirical study, Huber, Payne and Puto (1982) showed that decoys which are very similar to the target alternative lead to a greater attraction effect than dissimilar decoys. Similar decoys clarify best the dominance structure in the choice set. Accordingly, the target is easier perceived as being superior and therefore chosen with higher probability. If the decoy is removed from the choice set, the *negative attraction effect* is consequently expected to be stronger.

H2: If perceived decoy-target similarity increases, the negative attraction effect will rise.

5.2.4.3 Perceived Decoy Popularity

Individuals, who perceive the decoy as being more popular, on the one hand, will select it with higher probability and, on the other hand, will consider the target brand as more attractive (Huber et al., 1982) as it is obviously dominating the decoy. If subjects believe that even the inferior decoy is a popular alternative, the attractiveness of the target option can be increased. If individuals have to make a selection from the reduced choice set $\{T,C\}$, the target's attractiveness is less accentuated. However, the decoy's relatively high choice share in the initial choice set has to be distributed on the remaining brands. In sum, the target will nevertheless increase its choice share. Hence, I predict the *negative attraction effect* to be less pronounced for increased decoy popularity.

H3: If perceived decoy popularity decreases, the negative attraction effect will rise.

In addition, I suppose the perceived decoy popularity to have an effect on the observed decoy share. Subjects will tend to shift their preferences to the decoy and allocate more preference points to the decoy option when considering it as being more notable. Thus, I predict that decoy popularity will have a positive influence on the decoy's share.

5.2.4.4 Preference Strength

Mishra et al. (1993) define preference strength as a measure of conviction and trust in a specific brand. Strong preferences are those that are held with greater confidence, are more

stable, and are resistant to change (Yoon and Simonson, 2008). In particular, strong preferences indicate that decision-makers have a clear preference structure and distinctively favor one option in the choice set. These decision-makers will feel confident about their decision and consequently, will not be strongly affected by variations in the choice set. Conversely, low levels of preference strength signify an individual's indifference with regard to the selectable options. These consumers do not have well-established preferences and are unsure of their decision-making. In accordance to this, they are more likely to be affected by varying choice sets and to demonstrate the *negative attraction effect*.

H4: Respondents with higher preference strength demonstrate a lower negative attraction effect.

Preference strength can also be assumed to have an impact on another construct covered in the conceptual model – the share capture from the decoy. If preference strength is high (typically for the target brand), the decoy share consequently should be small in the complete choice set.

5.2.4.5 Task Involvement

Individuals' involvement in a decision task causes the consistency of preferences and decision-making (Johnson and Payne, 1985). Highly-involved consumers typically spend a lot of effort to solve a particular problem and to make a good decision (Muehling et al., 1993). In doing so, they are less likely to exhibit context effects. If, on the other hand, individuals are not involved in a choice task, they may be faced with a difficult decision problem. These individuals use choice heuristics to facilitate decision-making and can be easier biased as they treat given information more uncritically (Nowlis and Shiv, 2005) which should yield a larger *negative attraction effect*.

H5: For respondents who are more involved with the choice task the negative attraction effect will be diminished.

Typically, it is assumed that respondents' involvement with a choice task is influenced by their personal characteristics and past experiences with a product (Rothschild, 1979). Therefore, I expect that expertise has an impact on task involvement. The effect is supposed to be positive as individuals with a higher knowledge about a product class tend to include these capabilities in a decision task.

5.2.4.6 Perceived Information Relevance

Following Ratneshwar, Shocker and Stewart (1987), relevance is specified as the meaningfulness of a stimulus description in choice sets. Researchers in adaptive decision theory have claimed that the perceived information relevance influences consumers' decision-making process (Bettman, 1979; Dick et al., 1990; Meyvis and Janiszewski, 2002). If given information is perceived as being meaningless, individuals tend to decide referring to simplifying choice heuristics, for instance, by reverting to dominance structures in the presented choice set. By contrast, if individuals consider a given description of the choice options as being relevant, their decision making process should be facilitated and the consequential preference structure should be a stable one resulting in a diminished *negative attraction effect*.

H6: With a higher level of perceived information relevance, the negative attraction effect will be reduced.

The discussed construct is supposed to be influenced by task involvement since individuals who are not involved in the decision task will probably not consider any information as being useful or will even not make any effort in evaluating the meaningfulness of the presented information. Otherwise, if individuals enjoy the choice task, they will deem the information as more helpful and relevant. Accordingly, I expect task involvement to exhibit a positive impact on the perceived information relevance.

5.2.4.7 Decoy Share

By definition, the share captured by the decoy should normally be smaller than the one of the target or the competitor brand (Simonson, 1989) since it represents a dominated and inferior choice alternative. Small choice probabilities of the decoy in the complete choice set $\{T,C,D\}$ will result in only small shifts in choice probabilities in the reduced choice set $\{T,C\}$. A higher share captured by the decoy involves a rather high preference for the attribute on which decoy and target excel the competitor. Thus, the removal of the decoy will shift preferences to the – with regard to the obviously more important dimension similar – target brand. Accordingly, I expect the *negative attraction effect* to be less noticeable.

H7: *If the share captured by the decoy increases, the negative attraction effect will decrease.*

5.3 Method

5.3.1 Data Collection and Sample Selection

The data used to estimate the conceptual model and test the research hypotheses were drawn from an online survey. Two standardized questionnaires were distributed to undergraduate students of a large German university via a university wide mailing list. The final sample incorporated 594 respondents for frozen pizza and 763 respondents for smartphones. Of the pizza (smartphone) sample, 63.0 percent (64.5 percent) were female, the mean age was 25 (25) and the average household size was 2.3 (2.2).

5.3.2 Design

The tested product categories were pizza and smartphones, products which are frequently used by students and cover a wide range of involvement levels. While pizza is a repeat purchased product with a rather low-involvement level, smartphones represent high-involvement products (Antil, 1984).

I employ an original vs. an elaborated stimulus description to vary the product stimulus information used by respondents to distinguish between objects (Rathneshwar et al., 1987). While the original choice set information consisted of a brief situational description and a concise presentation of the available alternatives and their respective attribute levels (e.g., pizza A at a price p and quality level q), the elaborated description included a detailed explanation of the choice situation and the available alternatives (e.g., by reporting details about the quality ranking[13]).

[13] "The quality of frozen pizza was tested in a recent study conducted by a grocery testing company. Among others, they have tested the following characteristics: valuable ingredients, richness of the topping and the

In contrast to the basic study of Mishra et al. (1993), which covered three levels of decoy popularity, here, a two-level manipulation was carried out: The control group was not communicated anything about the popularity of the decoy, whereas in the other setting, respondents were informed that the market share of the decoy amounted to 40 percent. The results of Mishra and colleagues revealed that a third distinction (5 percent market share of the decoy) was not required since the respondents did not perceived the popularity of the decoy as being different from the control scenario (Mishra et al., 1993, p. 338).

Summing up, in this study, a 2 (product category: pizza vs. smartphone) x 2 (stimulus description: original vs. elaborated) x 2 (decoy popularity: control vs. 40 percent) mixed design was used. The respondents were randomly assigned to one of the two distributed questionnaires which cover the different experimental conditions as demonstrated in Table 5.1. The between-subject characteristic of the experiment arises from the randomized group assignment to one of the two questionnaires and consequently, different experimental conditions. Thereby, the survey length could be reduced to diminish respondents' drop-out rate. In addition, each condition included a pretest-posttest within-subjects design. The choice tasks were done on a within-subject basis to account for individual preference shifts and to measure the *negative attraction effect* at an individual level which is essential for using a structural equation modeling approach.

contribution to a well-balanced food. On the results of these tests, points for quality on a scale of 0-100 (100 corresponds to the highest quality) were allocated."

	Questionnaire 1			Questionnaire 2		
	Category	Stimulus description	Decoy manipulation	Category	Stimulus description	Decoy manipulation
1. condition	*Pizza*	*Elaborated*	*Control*	*Smartphone*	*Original*	*control*
Task 1	Complete choice set			Complete choice set		
Task 2	Reduced choice set			Reduced choice set		
2. condition	*Smartphone*	*Elaborated*	*40 %*	*Pizza*	*Original*	*40 %*
Task 1	Complete choice set			Complete choice set		
Task 2	Reduced choice set			Reduced choice set		

Table 5.1: Experimental Design

5.3.3 Stimuli

Keeping with previous research, alternatives were presented in an alternative-by-attribute matrix format and were distinguished on two attributes. Attributes (and attribute levels) were pretested to assure an equal weighting of both attributes. Accordingly, I selected price and quality rating for pizza, and memory in gigabyte (GB) and camera in megapixel (MP) for smartphone. The attribute levels are illustrated in Table 5.2. In the pizza setting, B represents a frequency increasing relatively inferior decoy which is asymmetrically dominated by C. In the smartphone setting, C characterizes a range-increasing decoy which is asymmetrically dominated by B. Alternative A is treated as competitor in both categories.

	Pizza			Smartphone	
	Price	**Quality**		**Memory**	**Camera**
		Complete choice set			
A	1.29€	40	A	2 GB	6.0 MP
B	2.45€	75	B	4 GB	3.2 MP
C	2.49€	90	C	4 GB	2.3 MP
		Reduced choice set			
A	1.29€	40	A	2 GB	6.0 MP
C	2.49€	90	B	4 GB	3.2 MP

Table 5.2: Product Categories and Attribute Levels

5.3.4 Procedure

Initially, respondents were informed that there were no right or wrong responses when answering the questionnaire and that only their individual evaluation was of interest. In the first part of the survey, respondents' familiarity and buying habits with regard to the product category were addressed including questions about product class usage, spending and expertise. Next, the first choice task was presented. Respondents made choices from the complete choice set {*A, B, C*} including the decoy. After responding to some questions about perceived popularity of the decoy, perceived similarity of the decoy in relation to the target as well as the competitor brand and information relevance, respondents were confronted with the reduced choice set {*A, C*} for pizza and {*A, B*} for smartphones. Each choice task was composed of two decisions: (1) participants indicated which brand they would buy (nominal choice)[14], and (2) they allocated preference ratings on a constant sum scale (ratio choice)[15]. The whole set of tasks was then repeated for the second product class. Finally, respondents' involvement with the tasks was measured and a set of demographic questions was asked. Summing up, in the analysis of the *negative attraction effect*, I employed the results of the four choice tasks of each individual (two choice tasks per category * two categories) as well as the individual evaluations concerning the different constructs.

5.3.5 Measures

A review of previous research on information-processing and decision-making (Bettman, 1979; Chaiken and Trope, 1999, Wright, 1974) as well as the applied operationalization of constructs by Mishra et al. (1993) provided the basis for my selection of measures.

[14] "Given that you had to buy one brand based on the given information alone, which one would it be? (Please assume that the brands are identical with regard to any other attribute.) "

[15] „Please distribute 100 points among the brands in proportion to the probability of choice for these brands, giving most points to the brand you prefer most. Make sure that the allocated points add up to 100."

Accordingly, a number of pre-existing scales that have been well validated in the literature were employed. Since the measures were originally developed for the product entry case, some of them were adapted to incorporate choice set specific characteristics for the inversed market exit case. The first columns of Table 5.3 list the items used to quantify each construct. Some major concepts are discussed in the subsequent section starting with the key endogenous construct.

Table 5.3: Measures

Construct	Items			Measures	α	ρ_c	AVE
Expertise (EXP_i)	*EXP_1*	x_1:	How much do you think to know about the product category frozen pizza / smartphones?	1-a bit, 7-a lot	0.918^1 0.948^2	0.917^1 0.947^2	0.734^1 0.819^2
			When buying a frozen pizza / smartphone, how do rate yourself?				
	EXP_2	x_2:	inexperienced vs. experienced	1-inexperienced, 7- experienced			
	EXP_3	x_3:	uniformed vs. informed	1-uninformed, 7- informed			
	EXP_4	x_4:	beginner vs. expert	1-beginner, 7-expert			
Decoy Similarity (SIM_i)	*SIM_1*	x_5:	How similar do you perceive the following product pairs? (C and B, A and B)[1] / (B and C, A and C)[2]	1-very dissimilar, 7-very similar $SIM_i^1 = SIM_{i,CB}\text{-}SIM_{i,AB}$, $SIM_i^2 = SIM_{i,BC}\text{-}SIM_{i,AC}$			
Decoy Popularity (POP_i)			How do you assess the following statements about the popularity of product B^1/C^2 with the help of the given Information?		0.932^1	0.934^1	0.781^1
	POP_1	x_6:	Product B^1/C^2 is an industry leader.	1-strongly agree, 7-strongly disagree	0.928^2	0.930^2	0.770^2
	POP_2	x_7:	Product B^1/C^2 is widely accepted.	1-strongly agree, 7-strongly disagree			
	POP_3	x_8:	Product B^1/C^2 is very popular.	1-strongly agree, 7-strongly disagree			
	POP_4	x_9:	Many people like product B^1/C^2.	1-strongly agree, 7-strongly disagree			
Preference Strength (PRE_i)	*PRE_1*	x_{10}:	Share of the most preferred brand (X) in the complete choice set.	$P_i(X\|\{A,B,C\})$	0.842^1 0.848^2	0.843^1 0.851^2	0.729^1 0.741^2
	PRE_2	x_{11}:	1 – share of the least preferred brand (Y) in the complete choice set.	$1 - P_i(Y\|\{A,B,C\})$			
Task Involvement (INV_i)	*INV_1*	y_1:	How inspiring were the given tasks?	1-a bit, 7-very	0.928^1 0.929^2	0.929^1 0.930^2	0.767^1 0.769^2
	INV_2	y_2:	How enjoyable were the given tasks?	1-a bit, 7-very			
	INV_3	y_3:	How interesting were the given tasks?	1-a bit, 7-very			
	INV_4	y_4:	How exciting were the given tasks?	1-a bit, 7-very			
Information Relevance (INF_i)			Please answer the following questions according to the purchase decision you previously made.		0.928^1 0.941^2	0.927^1 0.938^2	0.718^1 0.753^2
	INF_1	y_5:	How relevant was the given information?	1-not at all, 7-a lot			
	INF_2	y_6:	How important was the given information?	1-not at all, 7-a lot			
	INF_3	y_7:	How meaningful was the given information?	1-not at all, 7-a lot			
	INF_4	y_8:	How useful was the given information?	1-not at all, 7-a lot			
	INF_5	y_9:	How helpful was the given information?	1-not at all, 7-a lot			
Decoy Share (DS_i)	*DS_1*	y_{10}:	Share of the decoy in the complete choice set.	$P_i(B\|\{A,B,C\})^1\ P_i(C\|\{A,B,C\})^2$			
Negative Attraction Effect (NAE_i)	*NAE_1*	y_{11}:	Deviation from the target share expected under the Luce Model.	$NAE_i = E_L[P_i(C\|\{A,C\})] - P_i(C\|\{A,C\})^1$ $NAE_i = E_L[P_i(B\|\{A,B\})] - P_i(B\|\{A,B\})^2$			

[1] pizza, [2] smartphone

5.3.5.1 Negative Attraction Effect

The phenomenon that the removal of a dominated brand (decoy) reduces the attractiveness of the target brand is denoted the *negative attraction effect* (Sivakumar and Cherian, 1995; Wiebach and Hildebrandt, 2011). It results in a violation of some essential assumptions of rational choice decisions (e.g., regularity, similarity, proportionality (Luce, 1959)) since the relative share captured by the previously dominating target is reduced. Typically, it is assumed that the deletion of a brand leads to increased market shares of the other brands in proportion to their initial market shares (Luce, 1959, 1977). This is restated in the assumption of the independence of irrelevant alternatives which is incorporated in the Luce axiom (1959). To account for the occurrence of a *negative attraction effect*, in the current study the share of the target brand (*T)* expected by classical choice theory and the proportionality framework in the Luce model ($E_L[P_i(T|\{T,C\})]$) is compared to the observed share in the reduced choice sets ($P_i(T|\{T,C\})$). Therefore, the ratio data, collected by the constant sum scale[16] task, is used to compute the *negative attraction effect* at an individual level. Mathematically,

$$NAE_i = E_L[P_i(T|\{T,C\})] - P_i(T|\{T,C\}) \quad (4)$$

with

NAE_i – *negative attraction effect of respondent i,*

$E_L[P_i(T|\{T,C\})]$ – *expected share captured by target brand in the reduced choice set of respondent i under the Luce model,*

$P_i(T|\{T,C\})$ – *observed share captured by the target brand in the reduced choice set of respondent i*,

[16] The use of a constant sum scale to rate preferences involves respondents to not only report a prior choice. Instead, they have to consciously adapt and alter their ratings reflecting their preferences based on the exit of the brand (Sivakumar and Cherian, 1995).

$$E_L[P_i(T|\{T,C\})] = \frac{P_i(T|\{T,C,D\})}{P_i(T|\{T,C,D\}) + P_i(C|\{T,C,D\})} \cdot P_i(D|\{T,C,D\})$$

$$+P_i(T|\{T,C,D\}), \quad (5)$$

$$P_i(T|\{T,C,D\}) + P_i(C|\{T,C,D\}) + P_i(D|\{T,C,D\}) = 1 \quad (6)$$

and

$P_i(T|\{T,C,D\})$ – *respondent i's choice probability of the target brand in the complete choice set {T,C,D} (T – target brand, C – competitor brand, D – decoy).*

The outcomes of the *negative attraction effect* can be interpreted as described subsequently:

If $E_L[P_i(T|\{T,C\})] > P_i(T|\{T,C\})$

→ $NAE_i>0$, *i.e. a negative attraction effect is observed.*

If $E_L[P_i(T|\{T,C\})] = P_i(T|\{T,C\})$

→ $NAE_i=0$, *i.e. a negative attraction effect is not observed.*

If $E_L[P_i(T|\{T,C\})] < P_i(T|\{T,C\})$

→ $NAE_i<0$, *i.e. a positive attraction effect is observed (positive here means that, in contrast to the hypothesized effect, the target brand is strengthened by the removal of the decoy).*

5.3.5.2 Decoy Similarity

To measure the exogenous construct perceived decoy similarity, respondents were asked to indicate how similar they perceive the product pairs target and decoy as well as competitor and decoy on a 7 point likert scale (1 – very dissimilar, 7 – very similar). In reference to Mishra et al. (1993), the subtractive model of comparative judgment of Lynch (1985) as

relative measure of similarity is employed. Accordingly, similarity (*SIM*) is quantified as the difference between the perceived target-decoy similarity ($SIM_{i,TD}$) and the perceived competitor-decoy similarity ($SIM_{i,CD}$):

$$SIM_i = SIM_{i,TD} - SIM_{i,CD.} \quad (7)$$

SIM_i provides a relative measure of similarity. The *negative attraction effect* is expected to emerge if the decoy is perceived as being similar to the target but not to the competitor. Thereby, individuals can easily notice the dominance structure in the market resulting in the predicted preference shift. Conversely, the similarity measure SIM_i would be zero if the decoy is perceived as being equally similar to the target and the competitor. Consequently, no *negative attraction effect* should arise. A direct measure of similarity (e.g., $SIM_{i,TD}$) would not consider both perceived distances and accordingly, would not include this essential aspect.

5.3.5.3 Preference Strength

The independent construct preference strength (*PRE*) indicates the robustness and stability of a respondent's decision structure. High preference strength involves a high preference for a particular brand. On the contrary, if a respondent is indifferent to the available alternatives and allocates approximately similar preference ratings to the available brands, preference strength would be low. While Mishra et al. (1993) measure preference strength as a composite of centrality of preference and relative preference on the basis of the initial two-item core set, I utilize two different items gauging relative preference on the basis of the initial three-item choice set.

According to Urban, Hauser and Roberts (1990), relative preference signifies the strength of preference for one brand relative to the others. In the current research, the first item measuring relative preference arises from the individual preference ranking distributed to

the most preferred alternative in the complete choice set (e.g., $P_i(T \mid \{T,C,D\})$ if T has the highest choice probability for respondent i). It symbolizes a respondent's conviction in a particular brand and varies from 0.00 – 1.00. The second item used to measure preference strength is defined 1.00 minus the preference ranking of the least preferred option in the complete choice set and varies from 0.67 – 1.00. High values indicate a stable decision structure, while for low values there would be no clear-cut choice (each of the three options has approximately the same probability of choice).

$$PRE\_1_i = P_i(X \mid \{T,C,D\}) \tag{8}$$

with

$$X = \begin{cases} T, & \text{if } T \text{ has the highest choice probability for respondent } i \\ C, & \text{if } C \text{ has the highest choice probability for respondent } i \\ D, & \text{if } D \text{ has the highest choice probability for respondent } i \end{cases}$$

$$PRE\_2_i = 1 - P_i(Y \mid \{T,C,D\}) \tag{9}$$

with

$$Y = \begin{cases} T, & \text{if } T \text{ has the lowest choice probability for respondent } i \\ C, & \text{if } C \text{ has the lowest choice probability for respondent } i \\ D, & \text{if } D \text{ has the lowest choice probability for respondent } i \end{cases}$$

5.4 Results

5.4.1 Validation and Reliability

5.4.1.1 Constant Sum Scale

To estimate the structural equation model, the preference points distributed by the participants on the constant sum scale are used to gauge the *negative attraction effect*. Whether this preference rating reflects accurately the choice of the most preferred brand is tested subsequently. Comparing the choices deduced from the constant sum scale task and the nominal choice task, it can be concluded that for pizza 97.0 percent and for smartphones 97.8 percent of the participants showed identical choices. In addition, the high correlation coefficients between the two measures support the convergent outcomes of both responses ($r_{pizza}=0.943, p=0.000; r_{smartphone}=0.954, p=0.000$) indicating a high convergent validity of the constant sum scale.

5.4.1.2 Other Measures

Before evaluating the causal model as a whole, the measurements were examined to determine the reliability of the observed variables as measures of their respective latent constructs and to check for validity. I scrutinized Cronbach's alphas (α), composite reliability (ρ_c), and average variance extracted (AVE) for each scale as follows:

$$\alpha = \frac{n}{n-1}\left(1 - \frac{\sum \sigma_i^2}{\sigma_x^2}\right) \qquad (10)$$

with

n – number of indicators

σ_i^2 – variance of indicator i

σ_x^2 – variance of construct *x*

$$\rho_c = \frac{\left(\sum_{i=1}^{q} \lambda_{ij}\right)^2 \cdot \phi_{jj}}{\left(\sum_{i=1}^{q} \lambda_{ij}\right)^2 \phi_{jj} + \sum_{i=1}^{q} \theta_{ii}} \qquad (11)$$

with

λ_{ij} – estimated factor loading

ϕ_{jj} – estimated variance of the latent variable ξ_j

θ_{ii} – error variances

$$AVE = \frac{\sum_{i=1}^{q} \lambda_{ij}^2 \cdot \phi_{jj}}{\sum_{i=1}^{q} \lambda_{ij}^2 \cdot \phi_{jj} + \sum_{i=1}^{q} \theta_{ii}} \qquad (12)$$

with

λ_{ij} – estimated factor loading

ϕ_{jj} – estimated variance of the latent variable ξ_j

θ_{ii} – error variances

As is evident in Table 5.3, the reliability analysis revealed high internal consistency among the concerned items. The lowest Cronbach's alpha value was 0.84 for pizza and 0.85 for smartphones. All α's are well in excess of the 0.70 cut-off-value proposed by Nunnally (1978) and the threshold of 0.80 recommended by Rossiter (2002) suggesting an adequate reliability. Moreover, the results of a confirmatory factor analysis indicated that all composite reliabilities (ρ_c) met the recommended level of 0.70 (Bagozzi and Edwards, 1998). Convergent validity was assessed by exploring the magnitude and significance of the factor loadings and their associated t-values as well as inspecting the average variances extracted

(*AVE*) by each construct. All items significantly and positively loaded on their corresponding construct. Furthermore, all *AVE*s were well above Fornell and Larcker's (1981) suggested minimum value of 0.50 demonstrating reasonable convergent validity. In addition, I assessed discriminant validity following procedures outlined by Fornell and Larcker (1981). The results provide evidence for discriminant validity since the *AVE*s are substantially in excess of all shared variances by any of the constructs in both categories. Summing up, the measures used in this study were satisfactory in terms of reliability and validity and could be subsequently employed for model testing purposes.

5.4.2 Manipulation Checks

5.4.2.1 Negative Attraction Effect

Before discussing the results of the causal model, the occurrence of a *negative attraction effect* is demonstrated on an aggregate level by means of (1) nominal choice data and (2) constant sum scale ratio data (see Table 5.4). In the first choice task, 71.85 percent (67.76 percent) of participants selected the target brand *C* (brand *B*) in the frozen pizza (smartphone) category. While the Luce axiom and the *IIA* assumption predict a choice share of 80.11 percent for pizza and 71.81 percent for smartphones in the second choice task, the actually observed values 76.60 and 68.94 percent are significantly smaller (with $\chi^2 = 4.595$, $df = 1$, $p = 0.032$ and $\chi^2 = 3.108$, $df = 1$, $p = 0.078$). Since expected exceed real choice probabilities, a *negative attraction effect* is shown supporting the findings of Sivakumar and Cherian (1995) and Wiebach and Hildebrandt (2011). With respect to ratio data, the phenomenon is supported for smartphones ($E_L[P(B|\{A,B\})] = 62.95$, $P(B|\{A,B\}) = 60.79$ with $t = 3.290$, $df = 762$ and $p = 0.001$) whereas the mean of the distributed preference points to the target in the pizza category ($P(C|\{A,C\}) = 69.98$) does not deviate significantly from the predicted value ($E_L[P(C|\{A,C\})] = 69.95$).

	Pizza				***Smartphone***			
	Nominal choice							
	P(X|{A,B,C})	*P(X|{A,C})*	*E_L[P(X|{A,C})]*	*NAE*	*P(X|{A,B,C})*	*P(X|{A,B})*	*E_L[P(X|{A,B})]*	*NAE*
A	17.85%	23.40%	19.89%	-3.51%**	26.61%	31.06%	28.19%	-2.87%*
B	10.27%	-	-	-	67.76%	68.94%	71.81%	+2.87%*
C	71.89%	76.60%	80.11%	+3.51%**	5.64%	-	-	-
	Ratio choice							
	P(X|{A,B,C})	*P(X|{A,C})*	*E_L[P(X|{A,C})]*	*NAE*	*P(X|{A,B,C})*	*P(X|{A,B})*	*E_L[P(X|{A,B})]*	*NAE*
A	24.02	30.02	30.05	+0.03	31.86	39.21	37.05	-2.16***
B	19.33	-	-		51.89	60.79	62.95	+2.16***
C	56.65	69.98	69.95	-0.03	16.24	-	-	-

*$p<0.1$, **$p<0.05$, ***$p<0.01$

Table 5.4: Choice Shares and Choice Shifts (Nominal and Ratio Data)

5.4.2.2 Similarity

In both product categories, the decoy was constructed as being more similar to the target than to the competitor. This is essential for the occurrence of a *negative attraction effect*. To confirm the manipulation, participants' answers regarding the perceived similarity of the respective decoy and the other two brands were employed. The results of a paired sample t-test revealed that participants rated the target and the decoy to be substantially more similar ($M_{pizza}(SIM_{CB})=5.28$, $M_{smartphone}(SIM_{BC})=5.22$) than the competitor and the decoy ($M_{pizza}(SIM_{AB})=2.49$, $M_{smartphone}(SIM_{AC})=2.17$) with $t_{pizza}(593)=36.311$, $p=0.000$ and $t_{smartphone}(762)=40.153$, $p=0.000$. The minority of participants (less than 5 percent) who did not rated the similarity according to the manipulation were retained in the analysis, since the similarity construct is integrated in the causal model.

5.4.2.3 Decoy Popularity

In contrast to Mishra et al. (1993) who distinguished three levels of decoy popularity (see 3.2), I employed two different conditions: (1) control group and (2) 40 percent market share indicated for the decoy. To check the success of decoy popularity manipulation, the values of the respective items and their underlying factor are compared for both conditions.

Respondents perceived the decoy as being significantly more popular if its market share was announced to be 40 percent. A oneway ANOVA supported this result across categories ($F_{pizza}=5.281$, $df=1$, $p=0.022$; $F_{smartphone}=78.893$, $df=1$, $p=0.000$).

5.4.2.4 Information Relevance

To check whether participants evaluated the information given in the elaborated stimuli description setting as more relevant than in the original setting, their responses to the information relevance measure (*INF*) were compared by means of a oneway ANOVA. The results indicated that the manipulation was not successful for pizza. The mean of the factor scores for the elaborated setting $M_{pizza}^{elaborated}(INF) = -0.09$ was smaller than respective value for the original setting $M_{pizza}^{original}(INF) = 0.08$ with $F(1,592)=4.347$, $p=0.038$. When deciding on a frozen pizza, individuals obviously do not consider a detailed description of the quality ranking as more meaningful. Probably, the original description including merely the respective attribute levels are perceived as being more useful to decide on one of the presented repeat purchase products. By contrast, for the high involvement category smartphones, a detailed description of the available alternatives is considered to be more relevant and useful. Participants who faced the elaborated stimuli description rated the given information as significantly more relevant than the participants who answered the questionnaire including the original stimuli description ($M_{smartphone}^{elaborated}(INF) = 0.10$, $M_{smartphone}^{original}(INF) = -0.10$ with $F(1,761)=7.984$, $p=0.005$).

5.4.3 Model Estimation

The LISREL 8.7 (Jöreskog and Sörbom, 1996) structural equations program and the Maximum Likelihood (ML) method were used to estimate the model presented earlier in Figure 5.2. The correlation matrices of the observed variables were used as input and are

illustrated in Appendix 5.1 and 5.2. The subsequent analysis is primarily focused on the relationships between the constructs and the test of the discussed hypotheses.

5.4.3.1 Measurement Model

The estimated standardized factor loadings of the measurement model for the multiple-item constructs are highly significant ($p<0.01$, see Table 5.5). Each parameter is greater than 0.70 supporting the high reliability of the measures. The consistent results across categories indicate the constructs' stability.

		Product	
Antecedent	*Measures*	*Pizza*	*Smartphone*
EXP	x_1 [f]	0.757	0.843
	x_2	0.911	0.930
	x_3	0.783	0.880
	x_4	0.914	0.937
POP	x_6 [f]	0.766	0.773
	x_7	0.888	0.855
	x_8	0.958	0.955
	x_9	0.914	0.916
PRE	x_{10} [f]	0.876	1.000
	x_{11}	0.829	0.736
INV	y_1 [f]	0.793	0.804
	y_2	0.884	0.888
	y_3	0.913	0.911
	y_4	0.906	0.902
INF	y_5 [f]	0.708	0.746
	y_6	0.727	0.777
	y_7	0.845	0.840
	y_8	0.958	0.962
	y_9	0.917	0.951

All the measurement model paths are significant at $p < 0.01$.
For single item constructs the path loadings were fixed to 1.
[f] These path loadings were set equal to 1 for fixing the metric of the measure.

Table 5.5: Measurement Model and Standardized Factor Loadings

5.4.3.2 Fit Assessment

The model's overall fit was assessed on the following criteria: χ^2-goodness of-fit test; root-mean-square error of approximation (*RMSEA*; Browne and Cudeck, 1993); standardized root mean square residual (*SRMR*, Jöreskog and Sörbom, 1982) goodness-of-fit index (*GFI*, Jöreskog and Sörbom, 1982); and comparative fit index (*CFI*, Bentler, 1990). The estimation results indicate a significant χ^2-statistic ($\chi^2 = 384.46$, $df = 193$, $p < 0.01$ for the pizza model and $\chi^2 = 531.80$, $df = 194$, $p < 0.01$ for the smartphone model) suggesting a high discrepancy between the model-based covariance matrix $\hat{\Sigma}$ and the observed covariance matrix *S* and accordingly a poor model fit. However, this outcome is due to the large sample sizes which typically lead to low p-values (Bagozzi and Baumgartner, 1994; Bentler and Bonnet, 1980). Since the measure is known to be overly sensitive to sample size (MacCallum and Austin, 2000), Jöreskog and Sörbom (1989) recommended to instead utilize the Chi-square over degrees of freedom ratio (χ^2 / df) as descriptive goodness-of-fit measure. The ratio for the pizza model is 1.99, for the smartphone model it amounts to 2.74 suggesting an adequate model fit (Homburg and Giering, 1996). In addition, absolute and incremental goodness-of-fit indicators supported a good model fit. The *RMSEA* is 0.041 and 0.048 (smaller than the suggested 0.05) and the *SRMR* is 0.051 and 0.061 (smaller than the recommended 0.08 by Hu and Bentler (1999)) for pizza and smartphones, respectively, indicating marginal discrepancies. The *GFI* and *CFI* for the pizza model are 0.944 and 0.982, respectively. For the smartphone model, the *GFI* amounts to 0.940 and the *CFI* to 0.979. Both indices are consistently greater than 0.900, the recommended value for reasonable fit. To sum up, the model conceptualized in Figure 5.2 yielded a good overall fit.

5.4.3.3 Hypotheses Testing

This part, primarily concentrates on the relationships between the included constructs and the *negative attraction effect* to test the predictions of my hypotheses. The different antecedent variables can have both a direct and an indirect influence on the examined phenomenon. To improve the knowledge about drivers of the *negative attraction effect*, both types of effects are considered in the subsequent analysis. Table 5.6 illustrates the standardized values of the coefficient estimates. The results of each hypothesis are discussed next.

	Pizza			***Smartphone***		
	(χ^2=384.46, df=193, p<0.01, RMSEA=0.041, SRMR=0.050, GFI=0.944, CFI=0.982)			*(χ^2=531.80, df=194, p<0.01, RMSEA=0.048, SRMR=0.061, GFI=0.940, CFI=0.979)*		
Antecedent	*direct*	*indirect*	*total*	*direct*	*indirect*	*total*
EXP	-0.001	0.001	0.001	0.016	-0.002	0.013
SIM	-0.039	-	-0.039	0.017	-	0.017
POP	-0.033	-0.034***	-0.067	0.047	-0.051***	-0.004
PRE	0.017	0.073***	0.090***	-0.108***	0.094***	-0.014
INV	0.038	-0.017*	0.021	-0.014	-0.002	-0.016
INF	-0.074*	-	-0.074*	-0.005	-	-0.005
DS	-0.136**	-	-0.136***	-0.267***	-	-0.267***

Table 5.6: Standardized Effect Decomposition for the Negative Attraction Effect

Hypothesis 1 cannot be confirmed in the estimated model. There is no significant influence of expertise on the *negative attraction effect*. Apparently, the stability of preference structure is not determined by the respondent's product class expertise level in the analyzed sample. This finding can be due to the fact that the respondents exhibit rather high values of expertise in the considered categories. In addition, the presented attributes (price and quality for pizza / MB and MP for smartphones) and attribute levels are very clear and familiar to the target group. Respondents can easily use them to evaluate the available options without resorting to special skills and knowledge. They rather base their decision on the particular characteristics of the presented attributes in each choice set. Accordingly, the influence on the *negative attraction effect* is negligible.

Not only hypothesis 1 is rejected, but also the prediction that the *negative attraction effect* will increase with higher perceived decoy-target similarity (*hypothesis 2*). In contrast to the finding of Huber et al. (1982), in the present model no significant influence of perceived similarity is found. While previous research on product introduction has claimed that decoys which are very similar to the target option increase the target's attractiveness and accordingly the magnitude of the attraction effect, the overall model applied in this study does not confirm this relationship for product exit. Obviously, the similarity is important for the entry of a decoy resulting in an attraction effect but of no relevance for the removal of the decoy. If the similar decoy is deleted from the choice set, the target with the previously higher market share will lose its clearly dominant position and its choice probability will decrease (*NAE* increases). On the other hand, a previously similar decoy can result in a very little decoy share leading to only very little preference shifts when it is removed (*NAE* decreases). Consequently, both of these overlapping effects may generate the irrelevance of perceived decoy similarity for the size of the *negative attraction effect*.

The predicted negative impact of perceived decoy popularity is significant for both product groups confirming *hypothesis 3*. The effect is mediated by decoy share. Thus, the indirect effect is dominant here. I conclude that individuals who perceive the decoy to be very popular exhibit a lower *negative attraction effect*. Accordingly, the target's relative choice share is higher after the removal of the decoy. This finding delivers valuable insights for brand managers or retailers who decide on the deletion of brands.

The *fourth hypothesis* that higher preference strength will result in a lower *negative attraction effect* is supported for smartphones. The magnitude of preference shifts for respondents with a clear and stable preference structure is significantly lower than for indifferent or unsure respondents. This finding is not validated for the pizza category. Here, choices of respondents with higher preference strength lead to a stronger *negative attraction effect* although the direct effect is not significant. While for high-involvement goods an

existing stable preference structure in the initial choice scenario is also prevalent in the reduced choice task, low-involvement products apparently lead to preference shifts according to a *negative attraction effect*, even if preference strength is initially rather high. A possible explanation for this phenomenon includes typical characteristics of decision-making in low- vs. high-involvement categories: in high-involvement categories individuals tend to spend a lot of effort on a decision task. They precisely compare the different alternatives by taking into account any available information. If they clearly prefer an option, they will revert to this decision-making in the second choice task. This results in a comparable preference rating and thus, a diminished *negative attraction effect*. By contrast, low-involvement situations usually involve spontaneous decisions without checking each option's characteristics with the attributes of each other option. If individuals explicitly favor one alternative, they probably more easily adjust their preferences in the modified choice task by just splitting the decoy's preference points on the remaining alternatives which results in a stronger *negative attraction effect*.

I further expected that individuals who are more involved with the choice task exhibit a smaller *negative attraction effect* since they better assimilate the presented information (*hypothesis 5*). This effect operates through perceived information relevance. For this assumption, I find support for both product categories; the estimated parameters show a negative sign. However, the effect is not significant for smartphones.

According to *hypothesis 6,* the negative influence of information relevance is supported for the pizza category. The *negative attraction effect* is reduced if the presented information is perceived as being more relevant. This result is in line with the assumption that on the basis of meaningful information consumers are less inclined to build their decisions on simplifying dominance structures. For smartphones, the effect is also in the supposed direction but smaller and not significant. The summary statistics (see Appendix 5.1 – 5.2) show that the mean values of the items measuring perceived information relevance for smartphones are lower

than for pizza. Again, decision-making on the low-involvement good pizza is much easier than deciding on the high-involvement product smartphone. In accordance to that, individuals reported higher information relevance for pizza as the given information is more easily considered to be sufficiently meaningful to make a selection. High information relevance in low-involvement categories consequently lead to stable preferences and a significantly diminished *negative attraction effect*. The effect is reduced (and not significant) for the smartphone sample because, if these respondents consider the given information as being very relevant, they more likely include it in each new decision situation.

As expected in *hypothesis 7*, the share captured by the decoy has a negative influence on the *negative attraction effect* in both product categories. The estimated parameters indicate that decoy share has a considerable impact on preference shifts. In the estimated model, it proves to be the major construct in determining the magnitude of the *negative attraction effect*. For instance, for smartphones the impact is more than twice as high as for the next antecedent variable preference strength. A higher choice probability of the decoy comes along with increasing choice probabilities of the target brand in the initial choice set which results in a smaller *negative attraction effect*.

Overall, the results indicate that the hypotheses originally tested by Mishra et al. (1993) for product introduction are in part identical and supported for the market exit case (the negative influence of preference strength, task involvement and information relevance), some effects are inverted (the impact of decoy popularity and decoy share) and some hypothesized effects do not exist at all (expertise and perceived decoy-target similarity). The findings of both studies are summarized and contrasted in Table 5.7. To account for further relationships in the causal model, the next part of the paper will cover all other predicted effects between the included exogenous and endogenous constructs which are clarified in Table 5.8.

	Attraction effect (Mishra et al., 1993)		*Negative Attraction Effect*		
Antecedent	Expected sign	Products with significant results	Hypothesis	Expected Sign	Products with significant results
EXP	-*	Beer	H1	-	
SIM	+	Beer, Cars	H2	+	
POP	+	Beer, Cars, TV sets	H3	-	Pizza, Smartphones
PRE	-	Beer, Cars, TV sets	H4	-	Smartphones
INV	-	Beer, Cars, TV sets	H5	-	Pizza
INF	-	Beer, Cars, TV sets	H6	-	Pizza
DS	+	Beer, Cars	H7	-	Pizza, Smartphones

* Mishra et al. (1993) included experience in the two-dimensional construct knowledge

Table 5.7: Comparison of the Results on the Attraction Effect (Mishra et al., 1993) and on the Negative Attraction Effect

5.4.3.4 Other Effects

Firstly, as supposed decoy share is positively influenced by perceived decoy popularity. The results demonstrate the significant effect for pizza and smartphones. If individuals consider a decoy as being more popular, they tend to allocate more preference points to it. Secondly, the assumption that preference strength has a negative influence on the share captured by the decoy is corroborated across categories. Higher preference strength consistently leads to lower decoy shares since, in this case, high choice probabilities are typically observed for the target or the competitor brand. Thirdly, expertise has a significant positive effect on task involvement for smartphones. For pizza, the parameter estimate is also positive but not significant. It is supported that individuals with higher levels of expertise are more involved with the decision task. Fourthly, I expected task involvement to have a positive impact on information relevance. The displayed results in Table 5.8 provide evidence for this assumption. In both product categories a significant positive effect is observable. Accordingly, individuals who are more involved in the choice task deem information as more relevant and helpful.

	Pizza				*Smartphone*			
Antecedent	***NAE***	*INV*	*INF*	*DS*	***NAE***	*INV*	*INF*	*DS*
EXP	-0.001	0.072	-	-	0.016	0.152***	-	-
SIM	-0.039	-	-	-	0.017	-	-	-
POP	-0.033	-	-	0.251***	0.047	-	-	0.191***
PRE	0.017	-	-	-0.537***	-0.108***	-	-	-0.352***
INV	0.038	-	0.230***	-	-0.014	-	0.336***	-
INF	-0.074*	-	-	-	-0.005	-	-	-
DS	-0.136**	-	-	-	-0.267***	-	-	-

* $p<0.1$, ** $p<0.05$, *** $p<0.01$

Table 5.8: Direct Effects of the Causal Model

The LISREL results on modification indices and residuals gave us directions for modifications to the Mishra et al. (1993) model. In this regard, I re-ran the analysis after including an additional path which was neglected in the original model but can be expected to cover a significant effect.

5.4.4 Adapted Model

5.4.4.1 Conceptualization

Since decoy share proved to be the most important antecedent of the *negative attraction effect* in the initial model, it is essential to comprise each influential factor and relationship referring to this construct. I predict that information relevance is an additional driver of decoy share and adjusted the original model by adding a path between information relevance and decoy share (β_{32}). Generally, it is recommended to have some supportive theoretical justification when revising the original model (Hayduk, 1996). Individuals, who perceive the presented information as being relevant and meaningful, will take notice of the existing dominance structure with higher probability. In accordance to that, they will easier detect the inferiority of the decoy and will assign a lower preference rating to this option. Therefore, a negative influence of information relevance on decoy share can be assumed. To test this postulation,

the adapted model was estimated by means of LISREL 8.7 employing Maximum Likelihood estimation.

5.4.4.2 Results

The goodness of fit measures were slightly improved and suggest a good model fit. The χ^2 / df is 1.98 (2.66) for pizza (smartphones). The *RMSEA* amounts to 0.041 (0.047), the *SRMR* to 0.050 (0.059), the *GFI* to 0.945 (0.942) and the *CFI* to 0.982 (0.980). Table 5.9 and Table 5.10 include the parameter estimates. The results indicate that the discussed conclusions (see 5.4.3.3) with regard to the tested hypotheses on the *negative attraction effect* can be maintained. Though some of the estimated path coefficients slightly deviate from the outcomes of the original model (illustrated by bold figures), directions and significance levels stay unaffected. Considering the direct effects of the causal model depicted in Table 5.10, the added path reveals to cover a significant relationship. As expected, information relevance has a negative influence on decoy share across categories. Consequently, this effect should be included in the overall model when analyzing antecedents of the *negative attraction effect*.

	Pizza			***Smartphone***		
	(χ^2=380.68, df=192, p<0.01, RMSEA=0.041, SRMR=0.050, GFI=0.945, CFI=0.982)			*(χ^2=513.75, df=193, p<0.01, RMSEA=0.047, SRMR=0.059, GFI=0.942, CFI=0.980)*		
Antecedent	*direct*	*indirect*	*total*	*direct*	*indirect*	*total*
EXP	-0.001	**0.002**	0.001	0.016	**-0.001**	**0.015**
SIM	-0.039	-	-0.039	0.017	-	0.017
POP	**-0.032**	**-0.035*****	**-0.068**	0.047	**-0.056*****	**-0.009**
PRE	0.017	0.073***	0.090***	-0.108***	**0.092*****	**-0.017**
INV	0.038	**-0.015***	**0.023**	-0.014	**-0.009**	**-0.004**
INF	-0.074*	**0.009**	**-0.065***	-0.005	**0.033**	**0.028**
DS	**-0.137****	-	**-0.137*****	**-0.268*****	-	**-0.268*****

Bold values signify different estimates compared to the original model.
$^{*}p<0.1$, $^{**}p<0.05$, $^{***}p<0.01$

Table 5.9: Standardized Effect Decomposition for the Negative Attraction Effect – Adapted Model

	Pizza				*Smartphone*			
Antecedent	***NAE***	*INV*	*INF*	*DS*	***NAE***	*INV*	*INF*	*DS*
EXP	-0.001	0.072	-	-	0.016	0.152***	-	-
SIM	-0.039	-	-	-	0.017	-	-	-
POP	**-0.032**	-	-	**0.258*****	0.047	-	-	**0.210*****
PRE	0.017	-	-	**-0.531*****	-0.108***	-	-	**-0.342*****
INV	0.038	-	0.230***	-	-0.014	-	0.336***	-
INF	-0.074*	-	-	**-0.063***	-0.005	-	-	**-0.125*****
DS	**-0.137****	-	-	-	**-0.268*****	-	-	-

*$p<0.1$, **$p<0.05$, ***$p<0.01$

Table 5.10: Direct Effects of the Causal Model – Adapted Model

5.4.5 Reduced Model

5.4.5.1 Conceptualization

To increase explanatory power, I will next analyze a reduced model which simply comprises the influential constructs and the significant paths. Thereby, I provide a narrowed conceptual model which can easier be adapted to other categories and research questions by including all relevant relationships and drivers of the *negative attraction effect*. In a first step, the construct decoy similarity is eliminated from the model since it neither showed an effect in the original model nor in the adapted model. Obviously, the perceived similarity of the decoy and the target in comparison to the similarity between the decoy and the competitor does not affect the magnitude of the *negative attraction effect* for product exits (see discussion of hypotheses testing in 5.4.3.3). In addition, I removed several irrelevant paths to increase validity and informative value of the estimation results. The reduced model is depicted in Figure 5.3 and tested subsequently.

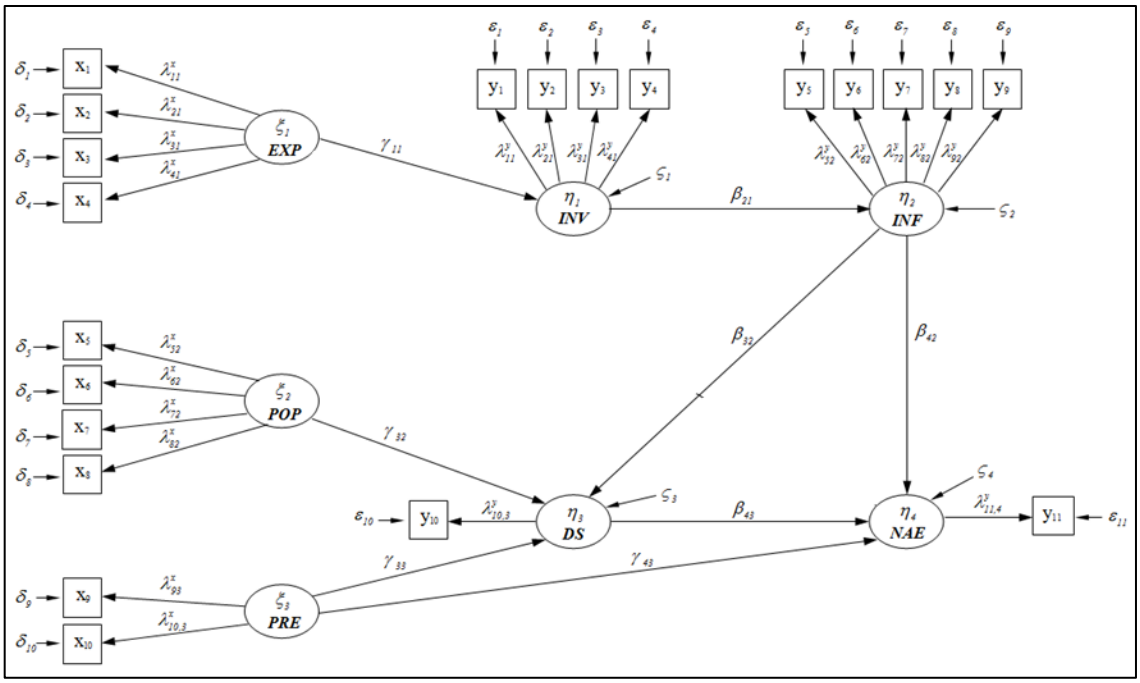


Figure 5.3: Reduced Model

5.4.5.2 Results

The fit statistics of the reduced model suggest that the research model provides a good fit with the data: For the pizza model $\chi^2 / df = 1.95$, $RMSEA = 0.040$, $SRMR = 0.050$, $GFI = 0.947$ and $CFI = 0.984$; for the smartphone model $\chi^2 / df = 2.28$, $RMSEA = 0.041$, $SRMR = 0.058$, $GFI = 0.952$ and $CFI = 0.986$. Further examination of the structural path coefficients demonstrated in Table 5.11 and Table 5.12 reveals that of the eight hypothesized paths tested, only two were insignificant for pizza (*EXP* → *INV* and *PRE* → *NAE*) and only one was insignificant for smartphones (*INF* → *NAE*). Hence, hypotheses 6 and 7 are supported for pizza and hypotheses 4 and 7 are corroborated for smartphones. These findings reinforce the particular importance of decoy share as driver of the *negative attraction effect*. In addition, the expected positive influence of decoy popularity as well as the negative impact of preference strength on decoy share are sustained. The assumption that higher expertise yields in a significant increase in task involvement is verified for smartphones. In contrast to decision-

making in low-involvement categories, decisions in high-involvement product groups (such as smartphones) are deliberate and include prior experience and skills. Accordingly, higher expertise levels will increase the consideration with the choice task and thus, the involvement with the choice task. It was further shown that information relevance is positively influenced by task involvement. At the same time, it exhibits the hypothesized negative impact on decoy share.

	Pizza			***Smartphone***		
	(χ^2=347.69, df=178, p<0.01, RMSEA=0.040, SRMR=0.050, GFI=0.947, CFI=0.984)			*(χ^2=405.33, df=178, p<0.01, RMSEA=0.041, SRMR=0.058, GFI=0.952, CFI=0.986)*		
Antecedent	*direct*	*indirect*	*total*	*direct*	*indirect*	*total*
EXP	-	**-0.001**	**-0.001**	-	**0.001**	**0.001**
POP	**-**	**-0.039*****	**-0.039*****	**-**	**-0.044*****	**-0.044*****
PRE	-0.006	**0.078*****	**0.085***	**-0.087****	**0.106*****	**-0.019**
INV	-	**-0.014**	-0.014	-	**-0.010**	**-0.010**
INF	-0.071*	0.009	**-0.061***	**-0.000**	**0.029*****	**0.029**
DS	**-0.148*****	-	**-0.148*****	**-0.256*****	-	**-0.256*****

$^{*}p<0.1$, $^{**}p<0.05$, $^{***}p<0.01$

Table 5.11: Standardized Effect Decomposition for the Negative Attraction Effect – Reduced Model

	Pizza				***Smartphone***			
Antecedent	***NAE***	*INV*	*INF*	*DS*	***NAE***	*INV*	*INF*	*DS*
EXP	-	0.072	-	-	-	0.152***	-	-
POP	**-**	-	-	**0.261*****	**-**	-	-	**0.171*****
PRE	**-0.006**	-	-	**-0.530*****	-0.087**	-	-	**-0.413*****
INV	**-**	-	**0.229*****	-	-	-	0.336***	**-**
INF	**-0.071***	-	-	**-0.064***	-0.000	-	-	**-0.114*****
DS	**-0.148*****	-	-	-	**-0.256****	-	-	-

$^{*}p<0.1$, $^{**}p<0.05$, $^{***}p<0.01$

Table 5.12: Direct Effects of the Causal Model – Reduced Model

5.5 Discussion

The purpose of this research was to increase knowledge about the phenomenon of a *negative attraction effect* when brands are removed from choice sets. By building on the conceptual work of Mishra et al. (1993) for product introductions, I empirically test an adapted holistic framework of factors that associate with the *negative attraction effect* for product exits. In particular, the removal of an asymmetrically dominated decoy and the resulting preference shifts were considered at an individual level in two product groups. The same model was estimated across categories to compare the importance of different antecedents and their interrelationships. The findings indicate that product group moderates the impacts on the *negative attraction effect* and provide significant implications for marketing academics and practitioners.

5.5.1 Theoretical Contributions

The current study makes several contributions to marketing literature. First, by synthesizing literature from different research domains and perspectives, this study delivers valuable insights on the relevance of context effects for market exits. Second, by combining a conceptual model for product entry with theory on choice set reductions, a first theoretical approach to analyze influencing factors of "negative" context effects is provided. Third, by undertaking the first integrated survey-based study, important drivers of theory-based choice modifications are empirically documented.

While research on the context-dependence of choice has so far concentrated on new product introductions (Huber et al., 1982; Dhar and Glazer, 1996; Pan and Lehmann, 1993; Tversky, 1972), this research emphasizes preference shifts as a result of product exit. In this regard, I verify the existence of a *negative attraction effect* and empirically test an overall framework to account for influencing factors of context-dependent preference shifts for brand

removals which, to date, has been lacking. Numerous studies on consumer decision-making when decoys are introduced in an existing market have highlighted the relevance of the product-decoy combination for the attraction effect phenomenon (Huber et al., 1982; Moran and Meyer, 2006). On the one hand, the current study demonstrates comparable outcomes for decoy eliminations while on the other hand, some findings expose essential differences.

Similar to Mishra et al. (1993), I find support for the negative influence of preference strength on the *negative attraction effect* in high-involvement categories. Individuals with a clear preference structure in the initial three-brand core-set are less likely to exhibit the *negative attraction effect*. In future choice experiments, this impact can only be controlled in within-subjects designs. Whereas in the basic study preference strength emerges as most important driver of the attraction effect, in the present model, decoy share exhibits the strongest influence on the *negative attraction effect*. A high decoy share causes a low *negative attraction effect*. This negative relationship is significant across categories for reduced choice sets contrasting the findings of Mishra et al. (1993) which show a positive effect of decoy share on the attraction effect. I further predicted and detected that decreasing decoy popularity intensifies the *negative attraction effect*, while in the product entry case the reversed relationship was supported.

Past research has suggested that context effects are less pronounced under conditions that facilitate decision-making (Simonson, 1989). My results reinforce this assumption by revealing a negative influence of information relevance on the *negative attraction effect*. In accordance to theory, consumers who classify the given information as relevant and include it in their decision process are less inclined to react in dependence of an altering context.

5.5.2 Managerial Contributions

This research also offers insight to retailers and managers. In general, it becomes evident that after the elimination of a brand, preferences and choice behavior are predictable using context

theory. Retailers can apply my findings when deciding on the delisting of brands which typically represent inferior options in the assortment. They further can assess the impact of an out-of-stock. From a supplier perspective, portfolio decisions can be based on some key findings of the presented study.

The theoretical analysis of the covered phenomenon indicates that after the removal of an inferior option, the target's brand share is higher if the *negative attraction effect* is reduced. Accordingly, practitioners with the aim to increase a target's choice share, can utilize the findings to answer the question: how to reduce the *negative attraction effect*?

First, in high-involvement categories, the removal of inferior brands pays off for customers with an inherently strong conviction in the target brand since the *negative attraction effect* decreases for high preference strength. Accordingly, choice probability of the target brand increases. On the other hand, the total effect of preference strength for low-involvement categories is positive. Therefore, to strengthen a target brand, retailers or brand managers should only remove dominated items if consumers are rather indifferent to the initially available options.

Second, the estimation results indicate that a high decoy share results in a limited *negative attraction effect*. Thus, it can be profitable to eliminate brands even if they generate moderate sales. Retailers should also take those brands into consideration for a removal which hold a non-negligible market share.

Third, the findings show that decoy popularity negatively influences the magnitude of the *negative attraction effect*. Consequently, the inferior brand which should be deleted should be presented as being popular, for instance by adding a tag which indicates that many people like this brand ("third most bought brand in 2010").

Fourth, this study reveals that information relevance decreases the *negative attraction effect*. Retailers can utilize the outcome by enhancing the perceived meaningfulness of the information presented at the point of sale. For instance, appropriate information should be

presented in a for customers useful way, more precise price tags should be introduced, customers can be educated or the relevance of a product group can be promoted by increasing shelf space. Thereby, consumers deciding on the reduced choice set can be manipulated to perceive the target brand as being attractive anymore.

Overall, to minimize the *negative attraction effect*, decision-making should be simplified. In practical terms, retailers should adjust their shelves by clearly arranging the available options, add precise information and displays or keep customers involved in the choice task, e.g. by presenting the available items at a secondary display.

5.5.3 Limitations and Avenues for Future Research

The contributions of this research are bounded by limitations that, in turn, underline potentially promising avenues for further studies.

One limitation arises from the application of a survey method to collect data which is normally accompanied by measurement error. However, analyzing the measurement model revealed no problem concerning this matter. Moreover, I collected data from a student sample from Germany. Consequently, the generalizability of my findings may be limited to this group of respondents and beyond this country. Future research is encouraged to validate the results across different target groups and geographical regions.

With regard to the involved alternatives and attribute levels, I build on previous context effect research. Accordingly, the selectable options of the three-item core set differed in only two dimensions reducing generalizability. Further research can extend the model to larger choice sets with alternatives characterized by more attributes. Probably, different results will emerge since it can be assumed that in larger choice sets choice heuristics are used more easily (Shugan, 1980).

The presented model includes a limited number of influencing factors. Several other antecedent variables could determine the *negative attraction effect*. For instance, loss aversion

as possible driver of the *negative attraction effect* can be added to the model since it is typically mentioned as one explanation for context effects (Simonson and Tversky, 1992). Research on phantoms (Farquhar and Pratkanis, 1993; Pettibone and Wedell, 2007; Hedgcock et al., 2009) has revealed that the type of the decoy affects preferences. "Known" and "unknown phantoms" can be differentiated describing the respondent's knowledge about the unavailability of the item prior to the decision process (Pratkanis and Farquhar, 1992). Both types of phantoms lead to differences in resulting preferences (Doyle et al., 1999; Gierl and Eleftheriadou, 2005). Doyle et al. (1999) further distinguished between "amenable phantoms" and "not so amenable phantoms". The unavailability of the "amenable" option is due to high demand whereas a "not so amenable" option was deleted with intent by the supplier. Their study uncovered different effects for both types of phantoms. Additionally, the timing of notification about product unavailability and the personal concern of the elimination can be considered as relevant for altered decision-making (Fitzsimons, 2000, Kim 2004).

By testing a structural equation model for the *negative attraction effect*, this study focused on one particular "negative" context effect. Following Wiebach and Hildebrandt (2011) and Wiebach and Diels (2011) who demonstrated the existences of additional negative context effects (a negative similarity effect as well as a negative compromise effect), a fruitful approach for further research includes the development and the test of drivers of these phenomena.

Appendix 5.1: Correlation Matrix and Descriptive Statistics of Measures – Pizza (n=594)

	y1	**y2**	**y3**	**y4**	**y5**	**y6**	**y7**	**y8**	**y9**	**y10**	**y11**	**x1**	**x2**	**x3**	**x4**	**x5**	**x6**	**x7**	**x8**	**x9**	**x10**	**x11**
y1 (*INV_1*)	1.000																					
y2 (*INV_2*)	.696	1.000																				
y3 (*INV_3*)	.722	.810	1.000																			
y4 (*INV_4*)	.724	.800	.827	1.000																		
y5 (*INF_1*)	.151	.130	.144	.133	1.000																	
y6 (*INF_2*)	.143	.173	.175	.196	.854	1.000																
y7 (*INF_3*)	.182	.193	.151	.178	.587	.586	1.000															
y8 (*INF_4*)	.203	.187	.170	.171	.669	.682	.821	1.000														
y9 (*INF_5*)	.193	.221	.211	.226	.674	.710	.758	.877	1.000													
y10 (*DS_1*)	.129	.048	.078	.094	-.107	-.093	-.027	-.067	-.068	1.000												
y11 (*NAE_1*)	-.034	.016	.019	-.008	-.053	-.049	-.063	-.058	-.046	-.147	1.000											
x1 (*EXP_1*)	.085	.064	.020	.049	.065	.022	.052	.050	.032	-.049	.018	1.000										
x2 (*EXP_2*)	.082	.096	.032	.031	.044	.011	.031	.034	.031	-.056	.022	.702	1.000									
x3 (*EXP_3*)	.098	.091	.048	.060	.068	.032	.054	.057	.028	-.011	-.038	.772	.704	1.000								
x4 (*EXP_4*)	.092	.095	.033	.037	.077	.018	.050	.048	.030	-.075	-.003	.680	.833	.725	1.000							
x5 (*SIM_1*)	.018	-.029	.006	-.015	.122	.099	.062	.053	.063	-.038	-.042	-.016	.038	.008	.028	1.000						
x6 (*POP_1*)	.140	.024	.038	.062	.014	.006	.010	.011	.029	.294	-.088	.012	.008	.015	-.004	.038	1.000					
x7 (*POP_2*)	.136	.070	.068	.081	.112	.122	.077	.086	.092	.309	-.072	.030	.073	.068	.071	.118	.703	1.000				
x8 (*POP_3*)	.174	.072	.061	.087	.112	.117	.093	.088	.087	.297	-.095	.021	.044	.048	.034	.113	.747	.840	1.000			
x9 (*POP_4*)	.157	.063	.047	.077	.135	.123	.099	.093	.086	.279	-.052	.029	.049	.046	.041	.125	.651	.823	.879	1.000		
x10 (*PRE_1*)	-.090	-.058	-.133	-.112	.079	.098	.007	.065	.060	-.499	.066	.076	.002	.026	.027	.007	-.035	-.070	-.080	-.072	1.000	
x11 (*PRE_2*)	-.078	-.033	-.074	-.091	.117	.132	-.023	.058	.072	-.469	.088	.071	-.005	.033	.006	.108	-.132	-.147	-.150	-.123	.727	1.000
Mean	2.811	2.658	2.820	2.380	5.175	5.126	4.205	4.505	4.561	0.193	0.000	3.949	4.492	4.040	4.278	2.786	3.646	4.458	4.241	4.399	0.689	0.929
SD	1.405	1.432	1.493	1.292	1.501	1.491	1.623	1.570	1.553	0.181	0.131	1.461	1.426	1.431	1.288	1.870	1.722	1.663	1.617	1.614	0.170	0.085
Min	1	1	1	1	1	1	1	1	1	0.00	-	1	1	1	1	-4	1	1	1	1	0.340	0.670
Max	7	7	7	7	7	7	7	7	7	1.00	0.578	7	7	7	7	6	7	7	7	7	1.000	1.000

Appendix 5.2: Correlation Matrix and Descriptive Statistics of Measures – Smartphone (n=763)

	y1	y2	y3	y4	y5	y6	y7	y8	y9	y10	y11	x1	x2	x3	x4	x7	x8	x9	x10	x11	x12	x13
y1 (*INV_1*)	1.000																					
y2 (*INV_2*)	.713	1.000																				
y3 (*INV_3*)	.724	.813	1.000																			
y4 (*INV_4*)	.731	.797	.823	1.000																		
y5 (*INF_1*)	.221	.169	.185	.165	1.000																	
y6 (*INF_2*)	.241	.205	.196	.195	.871	1.000																
y7 (*INF_3*)	.269	.259	.251	.248	.648	.649	1.000															
y8 (*INF_4*)	.312	.284	.285	.272	.705	.745	.813	1.000														
y9 (*INF_5*)	.308	.279	.287	.297	.722	.745	.791	.915	1.000													
y10 (*DS_1*)	-.022	.017	-.001	-.008	-.141	-.126	-.060	-.118	-.104	1.000												
y11 (*NAE_1*)	.002	-.020	-.001	.012	.036	.012	.008	.019	.031	-.217	1.000											
x1 (*EXP_1*)	.172	.107	.093	.119	.152	.165	.196	.169	.153	-.072	.012	1.000										
x2 (*EXP_2*)	.137	.097	.097	.137	.138	.145	.163	.140	.113	-.075	.032	.780	1.000									
x3 (*EXP_3*)	.115	.091	.081	.102	.104	.107	.130	.111	.083	-.051	.037	.825	.822	1.000								
x4 (*EXP_4*)	.143	.123	.129	.172	.116	.126	.148	.123	.100	-.031	.019	.794	.871	.821	1.000							
x7 (*SIM_1*)	.009	.017	.087	.023	.102	.062	.002	.021	.021	-.044	.035	-.002	-.021	.007	-.024	1.000						
x8 (*POP_1*)	.103	.039	.078	.051	.086	.084	.151	.140	.121	.159	.006	.104	.091	.080	.092	-.038	1.000					
x9 (*POP_2*)	.091	.061	.120	.055	.100	.102	.140	.162	.157	.199	.017	.054	.025	.016	.014	.088	.660	1.000				
x10 (*POP_3*)	.095	.094	.125	.083	.044	.053	.124	.131	.099	.216	-.007	.047	.015	.002	.032	.033	.758	.805	1.000			
x11 (*POP_4*)	.086	.081	.113	.041	.078	.084	.124	.158	.117	.230	-.012	.001	-.030	-.038	-.014	.045	.672	.804	.874	1.000		
x12 (*PRE_1*)	-.039	-.056	-.055	-.025	.084	.081	.048	.058	.053	-.374	-.014	.035	-.001	-.025	.026	-.052	-.081	-.134	-.097	-.120	1.000	
x13 (*PRE_2*)	-.024	-.015	-.045	-.030	.119	.108	.053	.065	.068	-.404	.050	.011	-.022	-.019	-.003	.093	-.172	-.184	-.165	-.185	.736	1.000
Mean	2.784	2.668	2.839	2.384	4.273	4.187	3.615	3.718	3.699	0.165	0.022	3.566	3.547	3.819	3.545	3.054	3.009	3.786	3.532	3.651	0.666	0.907
SD	1.419	1.451	1.500	1.297	1.773	1.759	1.667	1.685	1.706	0.179	0.181	1.602	1.687	1.689	1.556	2.101	1.668	1.606	1.613	1.598	0.181	0.099
Min	1	1	1	1	1	1	1	1	1	0.00	-1.00	1	1	1	1	-5	1	1	1	1	0.340	0.670
Max	7	7	7	7	7	7	7	7	7	1.00	1.00	7	7	7	7	6	7	7	7	7	1.000	1.000

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Erklärung gemäß §12(4) der Promotionsordnung der

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Hiermit erkläre ich, dass ich in meiner eingereichten Dissertation mit dem Titel

”Four Essays on the Context-Dependence of Consumer Preferences in Situations of Reduced Choice”

außer der angeführten Literatur keine weiteren Hilfsmittel benutzt habe. Hilfe habe ich im Rahmen von §12(2) der Promotionsordnung von Herrn Professor Dr. Lutz Hildebrandt im Rahmen des Betreuungsverhältnisses erhalten. Ich bezeuge durch meine Unterschrift, dass meine Angaben über die bei der Abfassung meiner Dissertation benutzten Hilfsmittel, über die mir zuteil gewordene Hilfe sowie über frühere Begutachtungen meiner Dissertation in jeder Hinsicht der Wahrheit entsprechen.

Berlin, 21. September 2011

Dipl.-Kffr. Nicole Wiebach