

Co-creation: Obtaining an advantage through the involvement of consumers

A study providing insights in the effects of co-creation in new product development on consumer perceptions of brands and products.



Master Thesis

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Does co-creation change the perceptions of consumer who are exposed to the co-created products?

SUMMARY (DUTCH)

Meer dan 50% van de nieuw gelanceerde producten falen wanneer ze geïntroduceerd worden in de markt. In de zeer concurrerende markten voor consumptiegoederen is het daarom belangrijk om onderscheidend te zijn en efficiënt en effectief in te spelen op de specifieke behoeften van consumenten. Co-creatie, het gezamenlijk creëren van nieuwe producten met consumenten waarbij ze actief ideeën bijdragen en/of nieuwe producten selecteren, kan worden gezien als een interessant instrument om de behoeften van de consument te bevredigen en meer succesvolle producten te ontwikkelen. Steeds meer bedrijven betrekken hun consumenten dan ook bij het ontwikkelingsproces. Op deze manier creëren ze succesvolle producten die aan de behoeften van de consument voldoen. In dit proces van co-creatie, kan de consument ofwel de bevoegdheid krijgen om producten te ontwikkelen of bevoegd worden om de producten te selecteren die volgens hem moeten worden geproduceerd. Het onderzoek dat tot dusver over dit onderzoeksgebied is uitgevoerd is vooral gericht op de consumenten die betrokken zijn bij deze processen. Echter, een grote groep consumenten, en misschien nog wel belangrijkere groep, is die, die wordt blootgesteld aan producten die zijn co-gecreerd. Aandacht gaat daarbij uit naar een andere belangrijke factor die een rol kan spelen in de effectiviteit van co-creatie processen namelijk: de complexiteit van de producten. Er is nog geen onderzoek gedaan naar het feit dat misschien niet alle producten geschikt zijn voor co-creatie. Wat als consumenten zijn betrokken bij het ontwikkelingsproces van zeer complexe producten?

Het doel van deze studie is om de effecten te meten van co –creatie op product percepties, merk percepties en gedragsintentie van consumenten die worden blootgesteld aan deze producten. Er is een online experiment uitgevoerd dat gericht was op de selectie van producten (selectie door het bedrijf versus selectie door de consumenten), de ontwikkeling van producten (ontwikkeling door het bedrijf versus ontwikkeling door consumenten) en de complexiteit van producten (eenvoudige producten versus zeer complexe producten). De behoefte om te zoeken naar nieuwe producten werd beschouwd als een moderator, maar was niet gemanipuleerd. Een totaal van 220 respondenten nam deel aan het experiment.

De resultaten tonen aan dat co-creatie een positief effect kan hebben op de percepties van consumenten. Er blijkt vooral een positieve relatie te zijn tussen co-creatie en de gepercipieerde klantgerichtheid van het bedrijf en product voordeel. Op basis van deze bevindingen kan er geconcludeerd worden dat het betrekken van de consument een voordeel kan hebben voor het bedrijf in de markt. Het modererende effect van complexiteit toonde aan dat mensen bewust ervaren dat een zeer complex product geschikt is voor co-creatie en men het product niet minder waardeerde wanneer het is ontwikkeld of gekozen door consumenten. Een mogelijke verklaring hiervoor is het feit dat (mede door de komst van internet) consumenten vinden dat ze zelf genoeg expertise hebben en daardoor de kennis van experts onderwaarden. Toch laten de resultaten wel zien dat de kennis van het bedrijf een rol speelt in de waardering van de kwaliteit van het product. Het lijkt erop dat mensen onbewust denken dat consumenten een waardevolle inbreng in het ontwikkelingsproces van nieuwe producten kunnen hebben, maar dat het bedrijf wel moet worden betrokken om er zeker van zijn dat er voldoende kennis en expertise aanwezig is.

SUMMARY (ENGLISH)

More than 50% of the newly launched products fail when introduced into the market. In the highly competitive consumer good markets it is therefore important to stand out and address the specific needs of customers efficiently and effectively. Co-creation, collaborative creating new products with consumers where they actively contribute ideas and/or select new products, can be seen as an interesting tool to satisfy consumer needs and develop more successful products. More and more companies involve their consumers in the development process. In this way they create successful products that fit consumers' needs. In this process of co-creation, consumers can either be empowered to develop products or empowered to select the products that should be produced. Most research in this area is focused on the consumers that are involved in those processes. However, a major group, and maybe even more important group, is the consumer who is exposed to co-created products. Attention goes out to another important factor that may play a role in the effectiveness of co-creation processes namely; the complexity of products. No research has been conducted yet about the fact that maybe not all products are appropriate for co-creation activities. What if consumers are involved in the development process of highly complex products?

The aim of this study is to investigate the effects of co-created products on product attitudes, brand attitudes and behavioural intentions of consumers who are exposed to those products. An online experiment is conducted which focused on the selection of products (selection by the company versus selection by consumers), the development of products (development by the company versus development by consumers) and the complexity of products (simple products versus highly complex products). Novelty seeking of consumers was considered as a moderator, but was not manipulated. In total 220 respondents participated in the experiment.

Results show that co-creation can have a positive effect on consumer perceptions. There especially appears to be a positive relation between co-creation and perceived customer orientation and product advantage. Based on those findings there can be concluded that involving consumers can have an advantage for the company in the market. The moderating effect of complexity showed that people consciously perceived a good fit for this highly complex product for co-creation and do not value highly complex products less positive when developed or selected by consumers. A possible explanation for this is the fact that (partly due to the advent of the Internet) consumers believe that they themselves have enough expertise and therefore undervalue the knowledge of experts. Nevertheless, results do show that knowledge of the company does play a role in the appreciation of the product quality. It seems that people unconsciously may think that consumers do have a valuable input in product development processes, but the company should be involved the be sure that there is enough knowledge and expertise available.

PREFACE

About six months ago I began this research as part of my Masters Communication Studies. During the first semester of my master I got the chance to delve into the literature concerning user generated content. Immediately my eye fell on the opportunities that lie within co-creation with consumers. After focusing more on this topic I became interested in the development of new products with the use of creative ideas of consumers. Very little research had yet been done in this area, however, I knew that this already was applied in real life. Examples of Pickwick and Lays came to mind and an idea for my master thesis was there. My master thesis would research the effects of co-creation with consumers on the brand and product perceptions of consumers who are exposed to it, with the focus on different levels of product complexity. Now, after six months, my research is finished and I can look back at a period of hard work and significant learning. Writing this master thesis has given me valuable insights into the field of communication science. However, this research could not have been completed without the help of some people, whom I would like to thank.

First of all I want to thank my supervisor Sabrina Hegner. She has assisted me throughout this whole process, provided me with valuable feedback, supported with my analysis and especially motivated me. During the whole graduation process she was always there when I had questions or doubts and gave me valued input. Also thanks to my second supervisor, Anna Fenko, for the critical analysis of my study. Additionally I would like to thank my family, boyfriend Niek and my friends for their support during these six months and continuously motivated me to finish my master thesis. Finally, thanks to everyone who participated in this research.

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Nathalie van der Lof

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1. INTRODUCTION

1.1 CO-CREATION: CREATING VALUE WITH CONSUMERS

With the introduction of Web 2.0 there has been a great shift in marketing communications. Brands are no longer only controlled by their managers, but increasingly shaped by consumers (Christodoulides, Jevons & Bonhomme, 2012). For consumers it has become easy to create content on the social web. With the advent of online brand communities, social networking sites, video sharing platforms and blogs (Gangadharbatla, 2008) a large group of consumers are nowadays able to participate online and to create user generated content (UGC). This can be simple messages about what they are doing on Facebook, movies posted on Youtube about themselves and friends, but, also brand related user generated content is shaped. Consumers become co- creators of brand meaning. With creating and sharing content, consumers have more and more influence over products and brands. But, created UGC does not always have positive consequences for a brand or product. It can even have very negative effects on brand meaning and eventually on outcomes of companies. Therefore it is not only important to research the impact of UGC on companies and brands, but also on consumers. It is the tasks of managers and companies in order to handle the UGC carefully and to make sure that it can be used for them in a positive way. Web 2.0 sites thus are changing marketing communications, especially in the way advertisers have the opportunity to reach consumers (Gangadharbatla, 2008). Brand related UGC is and will change marketing drastically.

Nevertheless, consumers are often not seen as active participants in the brand meaning processes, they are more seen as passive respondents to the offerings and products in the market (Wittel, Kristensson, Gustafson & Löfgren, 2010). Consumers, however, no longer see themselves only as consumers, they think of themselves as an integral part of the value creation for brands and products. Consumers are not satisfied anymore with the experiences that are only created by companies; according to Prahalad and Ramaswamy (2000) they want to create their own experiences through co-creation with companies.

Those earlier mentioned multimedia rich interactions between companies and consumers offered by the Web 2.0, in for example online communities, made (virtual) co-creation a player in creating value and improving new products (Füller, Mühlbacher, Matzler & Jawecki, 2006). An important example of co-creation is the collaboration of consumers and producers in new product development. In this way co-creation is defined as a process whereby consumers and producers interact, learn and share information to create value together (Prahalad and Ramaswamy, 2000). Thus, co-creation is the collaboration with firms and consumers, who are being co-producers of products and services (Hoyer, Chandy, Dorotic, Krafft & Singh, 2010). There are different ways to involve consumers, either by letting them actually develop the products or just give them only some empowerment by letting them select the products they find interesting.

Some examples of companies that already involve their consumers in new product development processes are BMW, Unilever, Procter & Gamble, Beiersdorf and Lays. They have created online platforms and invite consumers as their partners in the innovation process of new products. Consumers collaborate with these companies in order to develop new products that will fit their needs.

These collaborations with consumers can be very successful. For example, the international brand Dove developed a nationwide contest where people were asked to contribute their favourite fragrance on the Facebook page of Dove. In this way Dove tried to create a shower cream that would fit the needs of their customers (Molblog.nl). Another example of co-creation, but without

competition, is that of Threadless, a T-shirt manufacturer that invites consumers to contribute their own t-shirt designs. The design that gets the most pre orders will be produced. These are two successful examples of new product developments with the collaboration of consumers.

Co-creation can be of great value for companies, because research has confirmed that there are problems with the commercialization of new products. More than 50% of the newly launched products fail when introduced into the market (Ogawa & Piller, 2006). According to Hoyer et. al. (2010) the competences and insight of consumers can help companies to develop products that closely fit the consumers needs, which will increase the success of newly launched products. Companies can be more connected with consumers and creative products can be developed with higher quality. The fact that consumers communicate through all sorts of social media networks and give their opinions through those media can be seen as another advantage. In this way they shape conversations about the brand and products. By involving those consumers in the development process the important influencers can be used to create positive brand meaning.

However the consumers who are involved in those processes are not the only consumers to take into account. An even greater group of people is only exposed to co-created products. Still, most of the research on co-creation is directed at the consumers who participate in the process and create the products. Research so far has focused on motivations and perceptions of those consumers, the ones who take an active part in the product development process. The effects of co-creation on the ones exposed to co-creation, the ones that do not take part in co-creation activities, is hardly researched. Christodoulides, Jevons and Bonhomme (2012) give in their research the suggestion that maybe simply viewing rather than creating materials may cause a change in consumer-based brand equity. They suggest that there might be a change in attitudes of the consumers that are exposed to co-created products. This research area is of great relevance because there are more people simply viewing co-creation than actively participating in the co-creation processes.

Because of the important part that involvement of consumers will play in marketing communication this research is directed at the consumers exposed to co-creation with regard to the different levels of involvement of the consumers who participate. This will be done with attention to another important factor that may play a role in the co-creation process namely; the type of products. No research has yet been done about the fact that maybe not all products are appropriate for co-creation. What if consumers are involved in the development process of highly complex products? Will those products be perceived as highly qualitative to? Because of the knowledge that is necessary to develop those products, it may be that effects for those kinds of products are less positive or even negative.

1.2 RESEARCH QUESTIONS

Because of the little research that has been conducted about co-creation and the effects of it on brand and product perceptions of consumers who are exposed to it, this research shed light on that part of co-creation and give insight in the opportunities for companies to involve their consumers in the development process of new products. The research question that stands central in this research is the following:

“What are the effects of co-creation with consumers in new product development on the brand and product perceptions of consumers who are exposed to it?”

To answer the research question and in order to formulate the hypothesis, literature will be discussed. A set of sub questions has been formulated to give a comprehensive conclusion and to answer to the research question. The sub questions are listed below:

- Which products are perceived as simple products and highly complex products in the eyes of consumers?
- How are products evaluated by consumers when they are co-created with consumers?
- How is the brand evaluated by consumers when they involve consumers in the development processes?
- Does co-creation have an influence on the behavioural intentions of consumers towards the brand and product?
- Does the level of involvement with consumers in new product development have an influence on the effect of co-creation on brand and product perceptions?
- What is the moderating effect of product complexity (simple products versus highly complex products) in co-creation activities on brand and product perceptions?
- Does the level of novelty seeking of consumers plays a role in the adoption of co-created products?

2. THEORETICAL FRAMEWORK

This section gives an overview of the important concepts that are related to the research problem. First there will be given an introduction on co-creation, its definition and the important role it can play for companies and the effects it can have on consumer perceptions. After that, more insight will be given in the possible levels of involvement in the co-creation process and the influence of product complexity and novelty seeking on the success of co-creation. Finally, the concepts of consumer perceptions will be discussed.

2.1 CO-CREATION

With the available technologies on the web, consumers have the ability to communicate with other consumers and companies all over the world. As reported by Hoyer et al. (2010), this lead to a sense of “empowerment”, which means that consumers desire to play a more important part in the exchanges with companies. This empowerment and the greater control of consumers to create value are referred to as co-creation (Hoyer, Chandy, Dorotic, Krafft & Singh, 2010).

Ideas can easily be shared through different sources on the web, like websites, communities and social networks. According to Ernst et al. (2010) consumers are able and willing to contribute their ideas for new products, which can be used to fulfill consumers’ needs. As reported by Hoyer et al. (2010), involving consumers in the new product development process can lead to better valued products by consumers, which will lead to a better success of the new product. O’Hern and Rindfleisch (2009, p.4) define therefore co-creation in the context of new product development as “a collaborative new product development activity in which consumers actively contribute and select various elements of a new products’ offering”. It is about collective creating value by the company and consumers (Prahalad, 2004).

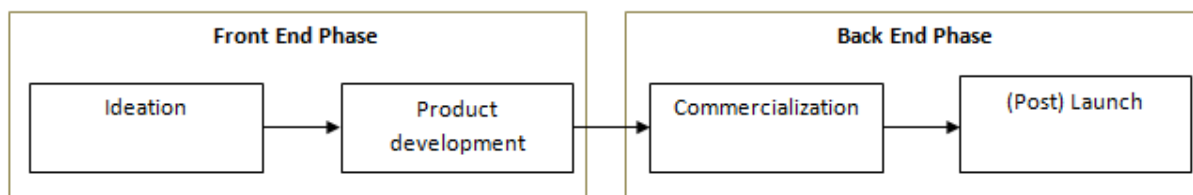
Kaulio (1998) state that the advantage for consumers in co-creation processes are that they do not only make a company aware of their problems, needs and wishes but take part in developing and selecting attractive designs and solutions. Hoyer et al. (2010) give some advantages of the use of co-creation in new product development for the company. First of all co-creating new products will reduce costs, because of the fact that there is less input needed from employees, suppliers etc. Second, co-creation can be used to build stronger relationships with consumers, especially with the ones who co-create. And, third of all, co-creation can lead to higher effectiveness of products and services. According to Hoyer et al.(2010), co-created products are perceived as fitting closer to the needs of consumers, having a higher perceived quality, a higher distinctive character and generate higher consumer preference for the former. A major advantage is that not only deeper insights are generated in the needs of consumers, it goes further; consumers give insights in new possibilities which make the product more innovative and attractive according to Füller and Matzler (2007) and especially lead to successful new products. As stated by Füller and Matzler (2007) the companies that really will be successful at innovating are the companies that are able to identify the needs of consumers and align these needs with the company’s competences. Because of the closer fit of co-created products to consumer needs, consumers are more satisfied and have a higher customer loyalty (Grissman & Stokburger – Sauer, 2012). Co-creation can therefore have an important effect on the way companies are perceived in the market (Pitt, Watson, Wynn & Zinkhan, 2006). Only if companies are able to identify the needs (and even the latent needs) they are able to develop products that stand out from competitive products and are truly customer centered (Füller & Matzler, 2007).

Several researchers investigated the effects of industrial co-operation with users of those products (Gales & Mansour – Cole, 1995; Schrader & Gopfert). In this research, the focus will be on goods which are used by the average consumers.

2.2 CONSUMER INVOLVEMENT IN CO-CREATION

According to Hoyer et al. (2010) the collaboration with consumers in all stages of the product development process are referred to as the scope of co-creation. Intensity of co-creation is the extent to which consumers are involved in the co-creation process within a particular phase of the product development process. So, when the intensity of co-creation in new product development is high, this implies that consumers have high responsibility for the development activities (Hoyer, Chandy, Dorotic, Krafft & Singh, 2010). This means that consumers can be involved in new product development in different ways and with different levels of freedom to create ideas (Piller, Ihl and Vossen, 2011), however, also in different phases of the product development process. Those phases of co-creation are displayed in figure 1 (Füller, Mühlbacher, Matzler & Jawecki, 2006; Hoyer, Chandy, Dorotic, Krafft & Singh, 2010). The figure shows that there are four different stages of the development process, divided in the front end phases and the back end phases.

Figure 1: Stages of the development process (Füller, Mühlbacher, Matzler & Jawecki, 2006; Hoyer, Chandy, Dorotic, Krafft & Singh, 2010).



In this research the focus will be on the front end phases of the development process, which therefore implies that the co-creation will take place in the ideation and product development phases. According to Cooper (1993), early stages of the innovation process are the most important for the success of new products. A high degree of consumer co-creation at the early stages of the product development process, the ideation and the product development phase, can increase the new product en firms' performance according to Gruner and Homburg (2000).

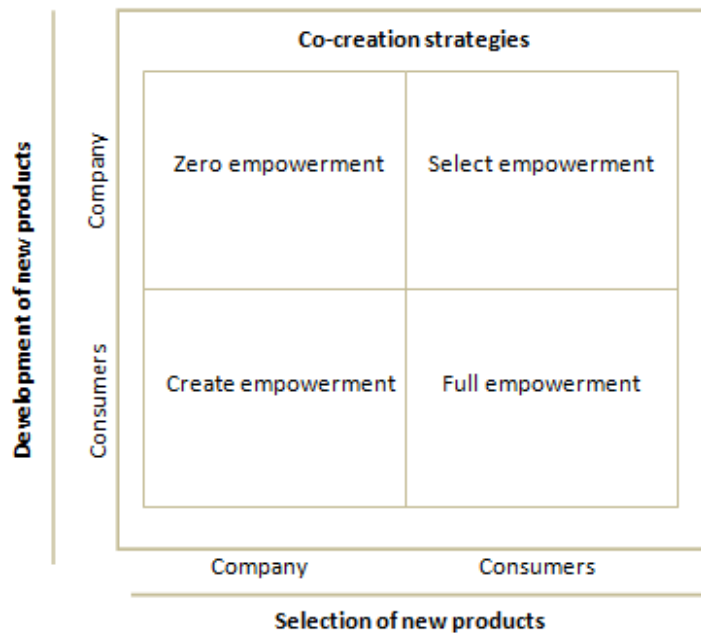
Piller, Ihl and Vossen (2010) state in their research that in the ideation and development phases there are two central activities; either generating concepts and ideas or selecting specific concepts and ideas to be further produced and market. Generating ideas is a task with a high degree of freedom, which means that there is more space to be creative and is more open than the task of selecting predefined ideas by the company (Piller, Ihl & Vossen, 2010). In this cooperation there can be made a distinction between the degree of collaboration between the company and an individual and between the company and several consumers. In figure 2 is shown how ideas can be generated with regard to those two possibilities. This research will be focused on the collaboration of companies with individual consumers. Ideation is mostly done by idea contests and the selecting products can be done by idea screening according to Piller, Ihl and Vossen (2010). This research will focus on the individual consumer as co-creator because of the amount of time that is reserved for the research.

Figure 2: Typology of consumer innovation at the front end process (Piller, Ihl & Vossen, 2010).

Degrees of freedom High <i>(creative & open task)</i>	Idea contests	Communities of creation for idea generation
	Product – related discussion forums	Idea screening trough customers
Low <i>(redefined & narrow task)</i>		
	Single customer	Customer community
	Degree of collaboration	

Kaulio (1998) state, that there are three designs strategies that can be used by a company. These strategies are; design for, design with and design by. Design for is the traditional way of product design, where general knowledge from consumers is used for the design. Very little input is generated from their customers (sometimes with the use of focus groups or interviews). In the design with strategy, consumers can react on concepts and designs; however they still do not create new products that fit their own needs. Design by is the strategy where consumers actively are involved and create and design products. In the approach of Kaulio (1998) consumer are either involved to select useful products, or actually create their own products. Kaulio (1998) refers to this as consumer idealized design; “a process of involving consumers in the actual design of new manufactured goods or services” (Cinciannelli & Magdison, 1993). Fuchs and Schreier (2010) also refer in their research to customer co-creation in terms of two different levels; customer empowerment to develop new ideas for products and customer empowerment to select the product designs that will be used for new products. Customer empowerment to develop new ideas implies that consumers can submit new ideas for products. Customer empowerment to select implies that consumers can vote on products that are designed by the company or consumers and they think should be market (Fuchs and Schreier, 2010). There is a distinction between the empowerment that the company has and the empowerment that the consumer has in the co-creation process. In addition to the research of Piller, Ihl and Vossen (2010) and Kaulio (1998) there is also cooperation were consumers can have full empowerment. In this way Fuchs and Schreier (2011) make a distinction between four levels of empowerment. The levels of co-creation are displayed in figure 3.

Figure 3: Co-creation strategies (Fuchs & Schreier, 2011)



The figure shows that there are four levels of empowerment of consumers in the development process. Zero empowerment is the traditional way of new product development. The company “creates” the ideas and will decide on which products are produced. In the select empowerment strategy, the company creates ideas or gives predefined options, and the consumers can vote on the products that they want to be produced (Fuchs & Schreier, 2011). The create empowerment strategy gives consumer the opportunity to develop and contribute their ideas, but the company decides if and which ideas will be produced (Fuchs & Schreier, 2011). The full empowerment strategy is the one which empowers consumers in both dimensions. In this way the development and decision making of new products is completely done by the consumers. They create ideas and vote on which ideas will be produced (Fuchs & Schreier, 2011).

Fuchs and Schreier (2010) conducted an experiment to test whether the different levels of involvement have an effect on perceived customer orientation and brand attitudes. The results showed that consumer involvement had a positive effect on several aspects. Full involvement seemed to have the highest level of customer orientation and brand attitudes. Also significant differences were found between create involvement and select involvement.

Based on this literature there can be expected that different levels of involvement will have different effects on the outcomes of co-creation. The higher the involvement of consumers in co-creation the more positive the outcomes will be. However, it may be that this will not hold for all types of products.

2.3 PRODUCT COMPLEXITY AS A MODERATING FACTOR

Co-creation can take place in the development process of different types of products but probably not all types will be perceived as appropriate for co-creation in the eyes of the consumer. In this research the distinction is made between the effects of co-creation in different product types on the perceptions of consumers.

The little research that has been conducted does not make a distinction between the different types of products that could be co-created. Fuchs and Schreier (2011) conducted a research to measure the effects of co-creation for three different product types. They made a distinction between the level of perceived risk, the level of engineering and the level of technology that was necessary to design the products. They had chosen the product categories t-shirts, furniture and bicycles. According to Fuchs and Schreier (2011) co-creation in those types of product categories generally would make sense. For those products many other users could be seen as knowledgeable enough to be involved in the development process, because the technology that is necessary for those products is not of a very high level. However, there could be a difference in the perceived appropriateness of co-creation in product categories based on their level of technological complexity.

Co-created products by an average consumer for a highly technological product type can be perceived as having a lower quality because of the missing knowledge of the consumer. Fuchs and Schreier (2011) state that consumers maybe believe that average users are not able to compete with the knowledge professionals in developing products or selecting highly technological products. There might be even a negative effect on the outcomes of co-creation in the fields where there are hardly any knowledgeable consumers. Schrader and Gopfert (1998) state in their study that co-creation with consumers can be inefficient due to the fact that consumers have limited expertise or knowledge.

According to Fuchs and Schreier (2010), users could be useful in helping define what features a product should have, but their value may be lower in defining how a product should work (Fuchs & Schreier, 2010). The ability of users in developing new products highly depends on the underlying industry or product category. They suggest that, when the knowledge that is necessary to create new ideas for products is highly complex or difficult to acquire, users are less likely to succeed in developing and submitting successful products and ideas. When the needed knowledge is low for developing new products, it is more likely that users might be successful (Baldwin et al., 2006; Lettl, Herstatt, and Gemünden, 2006; Lüthje et al., 2005 as cited by Fuchs & Schreier, 2010).

Companies can be seen as the ones that have the acquired knowledge and skills to develop products of higher complexity and therefore perform tasks more effectively and develop products that are of higher quality (Ulrich, 2007 as cited by Fuchs & Schreier, 2010). They (Fuchs & Schreier, 2010) argue that it is important that besides creativity of developers also other skills are of great importance for the development process. Technical, procedural and knowledge are important skills for generating useful ideas. With the level of expertise, and better understanding of product components, engineers can invent products with a higher reliability because they can avoid elements that provided failures in the past (Vincenti, 1990).

In the context of high technology products, product complexity is defined by Jacobs (2007, p.7) as follow; "Product complexity is a design state resulting from the multiplicity of, and relatedness among, product architectural elements". Products with a large amount of elements that are complex related to each other. Hill (1972) states that the level of technology that is necessary and the complexity to build the product will decide the level of technological knowledge that is necessary for the product development. According to Hill (1972), product complexity seen from the consumers' point of view shows the relationship between the level of product complexity (product technology) and the technical knowledge of the consumer.

Based on this information there can be expected that co-creation in highly complex products will have a less positive influence on brand and product perceptions than simple products will have,

because of the fact that average consumers are not seen as knowledgeable enough for those type of products.

2.4 NOVELTY SEEKING AS A MODERATING FACTOR

The main reason for applying co-creation with consumers in the development of new products is creating creative and innovative products. Those products will be more successful than products that are not co-created with consumers and are earlier adopted by them. A possible moderator in the perceived successfulness of co-creation activities and, more specific, the success of co-created products could be the search of consumers for new products (and product information) in general. The need for searching new products can be referred to as the innovativeness of consumers. Some people have more the tendency to buy new products more quickly and often than other people do. This tendency can be explained by the need for novelty seeking. Novelty seeking is an internal drive of a person (Pearson, 1970) to adapt new products (Hirschman, 1980). Novelty seeking is also seen as a broader concept which also considers the interest in other kinds of newness like information, ideas and behavior (Roehrich, 2004). It explains the motivation of consumers to retrieve information with regard to new products from sources like mass media, marketing communication of brands and direct product exposure (Roehrich, 2004). In the approach of Roehrich (2004) novelty seeking is especially related to new product consumption and takes place in the initial stages of the product adoption processes. Roehrich (2004) found in their research that novelty seeking is directly linked to the trial of new products. Hirschman (1980) state that novelty seeking can be seen as seeking out the new and different which will lead to willingness to adopt new products. New products may constitute new information in the form of ideas, services and tangible goods by which she means that a consumer who expresses the willingness to try new products automatically also expresses a desire for novel information. In the context of co-creation, novelty seeking can be seen as an interesting factor. Seeking for information about new products and especially products that are co-created with consumers can have an influence on the attitudes and behavioural intentions of consumers towards the brand and product. For high novelty seekers, characterized as; very interested in new products and brands, frequently looking for new products, and continuously seeking for new product experiences, it may be that they are more interested in co-created products. Co-creation with consumers can provide new products to high novelty seekers. They are more likely to adopt the product than low novelty seekers, who are less seeking for new product experiences and information about the products.

2.5 PRODUCT PERCEPTIONS

Co-creation is mostly used by companies to get new and better ideas from consumers to develop products that fit better with the expectations of the market. Companies try to develop highly attractive products (Prahalad & Ramaswamy, 2004). A closer fit of products can increase positive attitudes towards the products which in the end lead to higher purchase intentions and higher willingness to pay (Hoyer et al. 2010). In the context of co-creation it is interesting to research to what extend co-creation affects perceptions and expectations of consumers about new products. These consumers' perceptions can be investigated on two levels. The first level of consumer perceptions is on product level. This means that the effects of co-creation in different product categories on consumers' perceptions about the product are measured. This will be done with regard to the product attitude of consumers, perceived product quality and product advantage.

Product attitude

By involving consumers in the development process of new products, the products are likely to be better valued by consumers which lead to increased success of the new products (Hoyer et al. 2010). According to Hoyer et al. (2010), a closer fit of products to the needs of consumers will have a positive effect on the attitude towards the product. Hoyer et al. (2010) state that co-creation results in an increased effectiveness of products. They state that products are perceived as better fitted to the consumers, had a higher perceived quality and a better differentiation.

Franke, Keinz and Steger (2009) conducted a research to measure the effects of customized products on the attitude towards those products. Their results show that products that fit consumers needs and preferences are evaluated more positive (Franke, Keinz and Steger, 2009).

Product quality

The effectiveness of new products is often measured by their attractiveness, quality and innovativeness. Involvement of consumers in new product development can lead (as said before) to products that are perceived as better fitted to the consumers, having a higher perceived quality and a better differentiation. Products ideas invented by consumers will more closely mirror customer's needs according to Hoyer et al. (2010) and therefore are perceived as having higher quality.

However, according to Fuchs and Schreier (2011), those effects of co-creation may be influenced by the attendance of relevant knowledge and competence of consumers in a specific product category which is highly complex. Fuchs and Schreier (2012) state that in the case of highly complex products, the more competent and experienced the developers of new products are, the higher the expected quality of products will be. When many consumers have relevant knowledge about the product categories the cooperation with consumers can be a logic choice. Because of the fact that consumers generally do not have the necessary knowledge to develop high technology products, there can be expected that those products developed with consumers are perceived as having lower quality compared to simple products that are developed by consumers.

Product advantage

According to Song & Parry (1996) determinants of new product success are the competitive environment, the company's internal environment, the development process of the new product and the product competitive advantage. Competitive advantage is referred to as the advantage of a product based on their uniqueness and benefits in comparison to other available products (Kleinschmidt & Cooper, 2001). In the research of Cooper (1979) positive relations were found between the product success and the competitive advantage of products, such as unique features and high product quality. Also Song & Parry (1996) stated that competitive advantage of a product has positive effects on product success. In the case of co-creation, there can be reached a competitive advantage through the fact that the product is created by and with consumers and therefore will fit the needs of the consumers better.

Based on these facts there can be expected that co-creation with consumers can have a positive effect on overall product perceptions. The following hypotheses are therefore formulated, where product perceptions are measured by *product attitude, product quality and product advantage*.

H1: Co-creation in the way of product selection by consumers leads to more favorable product perceptions compared to product selection by the company

H2: Co-creation in the way of product development by consumers lead to more favorable product perceptions compared to product development by the company

H3: Higher levels of consumer involvement in co-creation lead to more favorable product perceptions.

H4: There will be an interaction effect of co-creation and product complexity, co-creation in highly complex products will have a less positive effect on product perceptions compared to co-creation in simple products.

H5: There will be an interaction effect of co-creation and novelty seeking; consumers who are high novelty seekers will have more positive product perceptions compared to low novelty seekers.

2.6 Brand perceptions

The second level on which perceptions can be measured is on brand level. This means that the effects of co-creation on consumers' perceptions about the brand will be measured. In this research the focus will be on three constructs for measuring brand perceptions; customer orientation, brand attitude and overall brand equity.

Customer orientation

An important outcome of co-creation in new product development can be the perceived customer orientation, which is referred to as; the ability of a company to satisfy consumers needs adequately (Brady & Cronin, 2001). It can be seen as a strategy to gain important information about the needs of consumers (Salomo, Steinhoff & Trommsdorff, 2003). Brown et al. (2002) state that customer orientation is the consumer perception about the degree of trying to satisfy the need of consumers. It requires an organization to determine the needs of the market and more important also satisfying those needs better than their competitors (Saxe & Weitz, 1986). High customer orientation is aimed at increasing long-term satisfaction of consumers. Seen from a company's point of view, customer orientation is integrating the voice of consumers in the different stages of product development (Bowen, Siehl & Schneider, 1989; Lengnick-Hall, 1996). From the consumers' point of view, it is his or her perception of the firm's level of customer orientation (Krepapa et al., 2003). In the research of Salomo, Steinhoff and Trommsdorff (2003), they state that customer orientation, acquiring needs and experiences, is particularly important for the development of new products. In the case of (innovative) new product developments, information about the needs and preferences of consumers is of high importance. However, with increasing innovativeness, consumers are less able to express their needs in detail (Salomo, Steinhoff & Trommsdorff, 2003).

Salomo, Steinhoff and Trommsdorff (2003) researched the effects of customer orientation and customer involvement on new product success. They stated in their research that customer orientation will increase by integrating consumers as initiators during the front end phases. According to Salomo, Steinhoff and Trommsdorff (2003) consumers as co-developers have to interact intensively with the development team and have a strong input in the development process. As a consequence of this, Salomo, Steinhoff and Trommsdorff (2003) claim that, this kind of cooperation constitutes stronger customer orientation. The results show that integrating consumers in the development of new product achieve better performance.

Fuchs and Schreier (2010) also conducted a research to measure the effects co-creation in new product development on the perceived customer orientation of the organization. They stated that not only the way that products are developed has influence on customer orientation, also the firm's customer orientated behavior. According to Fuchs and Schreier (2010) the consumers are the ones that will benefit from the use of products. Because of that, they suggest that, integrating the consumers in the development process as either co-developers or the ones that select which products should be produced will be a logic choice. In their research, Fuchs and Schreier (2010) have measured the effects of co-creation with consumers on the customer orientation of three different product categories (T-shirts, bicycles and furniture). Results show that, indeed, the involvement of consumers in early stages of the development process foster higher levels of perceived customer orientation. Higher levels of involvement have a positive effect on the perceived customer orientation. When consumers have full empowerment over the development and selection of products the customer orientation has the highest level. Also differences in results are found, although the levels of involvement do not differ significantly, between the empowerment of consumers to create the products and empowerment of consumers to select the product to be produced (Fuchs & Schreier, 2010).

Brand attitude

Co-creation with consumers in new product development may also affect corporate attitudes positively. Consumers' perceptions of a brand are important predictors of consumer behavior (Aaker & Biel, 1993). One of the ways in which brand perceptions can be measured is through measuring the attitude of consumers towards a brand. An attitude encompasses an internal evaluation and displays a (positive) feeling towards something (Spears & Singh, 2004). This attitude can be predicted by the convictions of somebody against the object and the evaluation of those convictions, according to Fischbein and Raven (1962).

McKenzie & Lutz (1989) suggested two dimensions for measuring consumers' brand perceptions. One dimension is the brand perception; these are the perceptions of consumers towards the brand. The other dimension is attitude towards the brand; the tendency to react on a positive or negative way on a particular brand. Based on the previous finding in literature expectations are that co-creation in general has a positive effect on brand attitudes, because brands are perceived as more customer orientated (McKenzie & Lutz, 1989).

Overall brand equity

Another important measurement of a brand's success is the overall brand equity. According to Yoo and Donthu (2001) the overall brand equity is the value of a specific brand compared to similar competing brands due to its name. In this case overall brand equity is used to measure the competitive advantage of a brand that applies co-creation over a same brand that does not co – create. Co-creation could provide a brand with some unique advantages over other brands, like, for example, more customer orientated behavior.

Based on the above literature the following hypotheses are formulated, where brand perceptions are measured by *customer orientation, brand attitude and overall brand equity*.

H6: Co-creation in the way of product selection by consumers leads to more favorable brand perceptions compared to product selection by the company

H7: Co-creation in the way of product development by consumers lead to more favorable brand perceptions compared to product development by the company

H8: Higher levels of consumer involvement in co-creation lead to more favorable brand perceptions.

H9: There will be an interaction effect of co-creation and product complexity, co-creation in highly complex products will have a less positive effect on brand perceptions compared to co-creation in simple products.

H10: There will be an interaction effect of co-creation and novelty seeking; consumers who are high novelty seekers will have more positive brand perceptions compared to low novelty seekers.

2.7 BEHAVIOURAL INTENTIONS

It is expected that co-creation will have positive effects on product success due to the fact that the product will fit better to the consumers' needs and preferences. This may be also reflected in more favourable behavioural intentions, such as purchase intentions and positive word of mouth.

Spears and Singh (2004) define purchase intentions as "Purchase intentions are an individual's conscious plan to make an effort to purchase a brand or product" (p.56). Therefore purchase intentions can be important predictors of the actual purchase behavior of consumers.

Another behavioural intention that plays an important role in marketing literature is word of mouth (WOM). WOM is defined as the communication between two private parties about the evaluations of goods and services (Anderson, 1989). This WOM may be positive, neutral or negative (Anderson, 1989). Consumers often rely on WOM when they consider the purchase of a new product or services argue Herr, Kardes and Kim (1991). According to Herr, Kardes and Kim (1991), word of mouth can have a strong influence on the rating of products. Anderson (1989) states that the degree of product or brand satisfaction or dissatisfaction is the most important factor for creating brand and product related WOM.

Fuchs and Schreier (2011) tested in their research whether co-creation had a positive effect on behavioural intentions. The results showed that there are significant differences in behavioural intentions like, purchase intentions, loyalty and positive word of mouth, when the products are developed with consumers.

But, these effects could be even negative in the case of highly complex products, because of lower perceived quality and less positive attitudes. Based on these expectations the following hypotheses are developed, where behavioural intentions are measured by *buy intentions and positive word of mouth*.

H11: Co-creation in the way of product selection by consumers leads to more favorable brand and product related behavioural intentions compared to product selection by the company

H12: Co-creation in the way of product development by consumers lead to more favorable brand and product related behavioural intentions compared to product development by the company

H13: Higher levels of consumer involvement in co-creation will lead to more favorable brand and product related behavioural intentions.

H14: There will be an interaction effect of co-creation and product complexity; co-creation in highly complex products will have a less positive effect on brand and product related behavioural intentions compared to co-creation in simple products.

H15: There will be an interaction effect of co-creation and novelty seeking; consumers who are high novelty seekers will have more positive brand and product related behavioural intentions compared to low novelty seekers.

3. STUDY 1: PILOT STUDY

A pilot study was conducted to select the product types that will be used for the experiment. These product types are based on their technological complexity. The goal of this pilot study was to verify which products are perceived as simple products and which are perceived as highly complex products. An online questionnaire was developed in order to measure the perceived complexity of nine products that were different in the levels of technological complexity. The outcomes of the research are used to choose two products that will be used in the experimental design of the main study.

3.1 METHOD

3.1.1 PARTICIPANTS

Respondents were selected through the use of personal networks. This led to a sample of 18 respondents out of which 15 questionnaires were completed. The sample consisted of 40% males and 60% females with an average age of 24,3 years.

3.1.2 PROCEDURE

Through the use of an online questionnaire on www.thesistools.nl, respondents were directed through the questionnaire. After a short introduction the respondents were asked about some demographic information like, age, gender and educational level. After this the respondents were confronted with nine different product types and were asked to rate the level of complexity for each product category. Participants were recruited by sending email invitations and with the use of social media.

3.1.3 INSTRUMENT

A list of nine different product types was created, based on the perceived complexity of the product types. Differences in these categories were based on the technical complexity to develop it and the ease to use or install the product. A 4-item scale was used based on the article of Hill (1972) and Anderson (1985) about perceived product complexity. The complexity was measured on a 7 - point Likert scale from totally disagree till totally agree. Respondents had to indicate for each product category to what extent they agreed with the statements. An example of one of the statements was: This is a technical complex product.

3.1.4 MEASUREMENTS

A reliability analysis was conducted to test the reliability of the scale for each product type. In table 1 the results of the reliability analysis are displayed. The Cronbach's alpha's for the complexity construct per product category, the number of items of the scale and the number of participants are displayed.

Table 1: Reliability of the constructs

Constructs	Number of items	Cronbachs Alpha	N
Complexity	36	0.905	15

3.2 RESULTS

The results from the pilot study are displayed in table 2. Respondents rated ice cream, tea and bags as the simplest products. Computer software, televisions and mobile phones were rated as highly complex products. As shown in the table, tea (M=1,33) and ice cream (M=1,45) are perceived as the simplest products (the lowest complexity) where mobile phones (M=6,17) and computer software (M=6,31) are the products that are perceived as the highly complex products. Compared to the products that are used in the article of Fuchs and Schreier (2010), wherein bicycles and furniture were used, the highly complex products in this study are significantly perceived as more complex. For this research it is interesting to use ice cream and computer software, because of the fact that people can give creative input for those product categories.

Table 2: Perceived complexity associated with the product categories

Products	Mean	SD	N
<i>Bag</i>	<i>1,8667</i>	<i>.990</i>	<i>15</i>
<i>Ice Cream</i>	<i>1,4500</i>	<i>.733</i>	<i>15</i>
<i>Sportshoes</i>	<i>3,1333</i>	<i>1,06</i>	<i>15</i>
<i>Computer Software</i>	<i>6,3167</i>	<i>.710</i>	<i>15</i>
<i>Bicycles</i>	<i>4,2167</i>	<i>1,17</i>	<i>15</i>
<i>Tea</i>	<i>1,3333</i>	<i>.587</i>	<i>15</i>
<i>Television</i>	<i>5,8333</i>	<i>1,19</i>	<i>15</i>
<i>Mobile Phone</i>	<i>6,1667</i>	<i>.957</i>	<i>15</i>
<i>Furniture</i>	<i>2,8667</i>	<i>1,45</i>	<i>15</i>

* All variables were measured on a 7 – point Likert scale (min=1, max=7), N=15

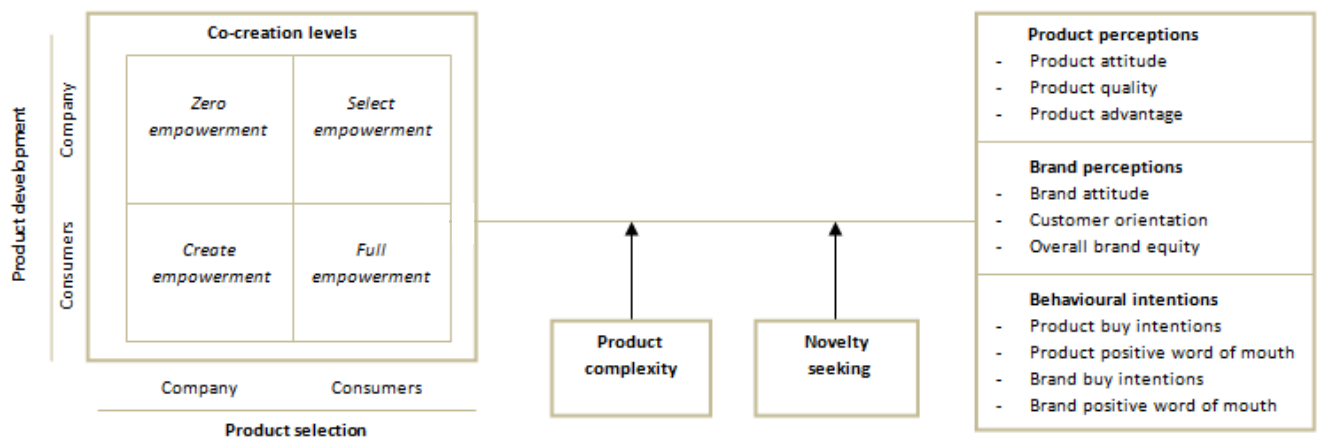
4. MAIN STUDY: EXPERIMENT

The main study consisted of an online experiment. This chapter will give an overview of the research method, the participants, materials, procedure and measurements used for this research.

4.1 METHOD

The hypotheses were tested using a 2x2x2 factorial design. Model 1 displays the research model. The manipulated factors in this experiment were the following; product selection (selection by the company versus selection by consumers) X product development (development by the company versus development by consumers) x product complexity (simple products versus highly complex products). Novelty seeking is seen as a moderating factor, but was not manipulated in this research. The experiment was conducted as an online survey with 8 different conditions to validate the stated hypotheses. There is chosen for a questionnaire because of the efficiency and the large sample sizes that are possible. Respondents stay anonymous which can lead to a higher number of participants and more truthful answers (Dooley, 2001). The participants were randomly assigned to one of the eight conditions. Given the limited time in which this research is conducted, there is chosen to make use of a cross sectional design. This means that there will be drawn a sample of the population at a certain time. In this way there can be drawn a conclusion across a wide population (Dooley, 2001). For the manipulation of the involvement of consumers and the product complexity eight different advertisements are used.

Model 1: Research model 2x2x2 design (selection x development x product complexity; with the moderating effect of novelty seeking)



4.2 PARTICIPANTS

Participants were recruited with the use of social network sites like Facebook, Twitter and LinkedIn. This led to a sample of 309 respondents, out of which 220 questionnaires were complete and useful for data analysis, the response rate was 71.2%.

The sample consisted of 39.1% males and 60.9% females with an average age of 29 years ranging from 16 to 58 years. More than 75% of the respondents followed higher education. The distribution of respondents over the eight different conditions is reasonably equal. Because of the fact that respondents were randomly assigned to one of the eight conditions, the groups' sizes are not completely equal, but for each cell at least 25 respondents are reached. In table 3 the distribution of respondents is displayed.

Table 3: Distribution of the 8 conditions (2x2x2)

	N	Percentage	Development	Selection	Type of product
R N=220	27	12,3	Company	Company	Simple
	25	11,4	Company	Consumer	Simple
	28	12,7	Consumer	Company	Simple
	32	14,5	Consumer	Consumer	Simple
	25	11,4	Company	Company	Highly complex
	27	12,3	Company	Consumer	Highly complex
	24	10,9	Consumer	Company	Highly complex
	32	14,5	Consumer	Consumer	Highly complex

4.3 MATERIALS

Eight different advertisements were developed to manipulate the level of involvement and the product complexity. There circulated advertisements of a simple (ice-cream) with either zero empowerment, select empowerment, create empowerment or full empowerment and an advertisement of a highly complex product (software) with either zero empowerment, select empowerment, create empowerment or full empowerment. The level of involvement was manipulated through the information on the advertisement. There was made clear who had developed the product, either the consumer or the product developers of the brand and who had selected the product, either the consumer or the product developers of the brand. A fictive brand name and logo was used for the advertisements to make sure participants were not influenced by the brand image of a known brand. Figure 4 displays an example of two advertisements with one of the eight conditions.

Figure 4: Example of the advertisement (Create empowerment version) for ice-cream and software (in Dutch)

Chocolate Chip Muffin

Het verhaal achter Chocolate Chip Muffin
Deze ijsmaak is bedacht door de consument. Consumenten hebben door middel van hun ideeën en visies een aantal vernieuwende ijsmaken bedacht. Uit deze reeks smaken hebben de productontwikkelaars van Alcet de lekkerste smaak gekozen, die uiteindelijk is opgenomen in het productassortiment van Alcet.

Alcet photofix 6.0

Het verhaal achter Alcet photofix 6.0
Deze computersoftware is bedacht door de consument. Consumenten hebben door middel van hun ideeën en visies een aantal vernieuwende softwaresystemen bedacht. Uit deze reeks ontwerpen hebben de productontwikkelaars van Alcet de meest aantrekkelijke versie gekozen, die uiteindelijk is opgenomen in het productassortiment van Alcet.

4.4 PROCEDURE

Before the questionnaire was set online, a pre-test of the questionnaire had taken place under five persons. They were asked to check whether they found the manipulation successful and if there were any imperfections, ambiguities or errors in the questions and/or answer options. The feedback that emerged from the pre-test is processed in the final questionnaire.

To check whether the manipulation was successful, a manipulation check was conducted among 28 participants. The manipulation check was divided into two versions, each version showed advertisements with one of the two products. Advertisements showed either the simple product or the highly complex product. Each version of the manipulation check contained four versions of the advertisements. The advertisements showed whether the product was developed and/or chosen by the consumer or by the company. For each of the advertisements the respondent had to indicate whether he or she thought that, based on the advertisement, the product was developed by the brand or by the consumer and whether he or she thought that the product was selected by the brand or the consumer. The manipulation check was also used to check whether the products were indeed perceived as a simple and a highly complex product. This was measured by the scale as used in the pilot study, based on the article of Hill (1972) and Anderson (1985). There was intentionally chosen to separate the two product categories, to be sure that the complexity was measured on the basis of the product that they had seen, without comparison to other products. Participants could indicate on a scale from 1 till 7 (1 = totally disagree, 7 = totally agree) to which extent they agreed with the four statements. The manipulations seemed successful. It seemed clear to the participants who had developed or selected the product in the advertisement. Also the products differed significantly in complexity. Scores for the simple product had to be 2 or lower. The scores for the highly complex product had to be 5 or higher. The results of the product complexity are shown in table 4. An independent sample T-test was conducted to test whether the differences in means for the two products were significant. As displayed, ice-cream ($M=1.71$, $SD=0.812$; $t(0,488)=12.69, p=.00$) is perceived as a significantly less complex product than software ($M=5.28$). The magnitude differences in the means was very large ($\eta^2 = .861$).

Table 4: Results of the complexity manipulation

Level of product complexity	Mean	SD	N
Simple product (Ice-cream)	1,71	0,812	15
Highly complex product (Software)	5,28	0,652	13

*(min = 1, max = 7) (N=28)

The main experiment has been accessible online for a period of three weeks via a Dutch online survey tool: Thesistools.nl. Participants were randomly assigned to one of the eight conditions (advertisements). A short introduction was given about a new brand called Alcet, which either had developed a new ice-cream or new computer software. The participants were told that Alcet had developed an advertisement for the launch of the new product and that the brand was curious about their opinion about the brand and their new product. After this short introduction the advertisement was displayed. Participants were asked to watch and read it thoroughly, after which questions were asked about their brand perceptions and behavioural intentions.

Subsequently the advertisements were displayed again. Participants were asked to take another look at the advertisement with regard to the product in the advertisement, after which questions were asked about their product perceptions, behavioural intentions and the perceived fit for co-creation. Finally the participants were asked about their general interest in the product category and their interest to search for new products. At last some demographical background information was asked.

4.5 MEASURES

The questionnaire consisted of constructs on three levels. These levels were; brand perceptions, product perceptions and behavioural intentions. Scales were taken from relevant literature. All of the items were adjusted to the context of this research, the launch of new products.

4.5.1 BRAND PERCEPTIONS

The brand perceptions are measured on the basis of three constructs namely; brand attitude, customer orientation and overall brand equity.

Brand attitude was measured on a 7- point semantic differential scale based on the research of Spears & Singh (2004). The scale consisted of 5 items. Participants had to indicate which characteristics they found most suitable for the brand they saw in the advertisement. Some examples of the used contradictions were; bad brand – good brand, unpleasant brand – pleasant brand, unfavourable brand – favourable brand etc.

Customer orientation was measured on a 5 – point Likert scale based on the research of Sax & Barton (1982).

Overall brand equity was also measured on a 5 – point Likert scale. The scale consisted of 4 items based on the research of Yoo & Donthu (2001). Respondents had to indicate to what extent they agreed with the statements.

4.5.2 PRODUCT PERCEPTIONS

The product perceptions are measured with the use of three constructs; product attitude, product advantage and product quality.

Product attitude was measured through 3 items on a 7 – point semantic differential scale which was arrived from the research of Spears & Singh (2004). Participants had to indicate which characteristics they found most suitable for the displayed product in the advertisement. Some examples of the used contradictions are; bad ice cream/software – good ice cream/software, unattractive ice cream/software – attractive product ice cream/ software.

Product advantage was measured on a 5 – point Likert scale based on the research of Song & Parry (1996). The construct consisted of 3 items which measured the advantages on the basis of statements like; ‘Compared to competitive ice cream, this ice cream offers some unique features/ attributes to the customers’.

Product quality was also measured on a 5 – point Likert scale. The scale consisted of 5 items based on the research of Yoo, Donthu and Lee (2000). Participants had to indicate on the basis of the advertisement what they thought about the quality of the products (the ice-cream in the advertisement is of high quality; the ice-cream in the advertisement must be of very good quality).

4.5.3 BEHAVIOURAL INTENTIONS

Behavioural intentions were measured on two levels. The same items were asked on brand level and product level. Behavioural intentions were measured on the basis of two constructs, the intention to

buy the brand and product and the likelihood to spread positive word of mouth about the brand and product.

Intention to buy was measured on a 5 – point Likert scale based on the research of Bower and Landreth (2001). The scale consisted of 5 items. Participants had to indicate on a scale from 1 till 5 to what extent they agreed with the statements (*I am eager to check out the brand/product because of this advertisement; I intend to try this brand/product etc.*)

Positive word of mouth was also measured on a 5 – point Likert scale. The scale consisted of 2 items which were based on the scale of Maxham III (2001). Participants had to indicate how likely it was that they would recommend the brand or product to their friend or family.

4.5.4 NOVELTY SEEKING

The extent in which people search for new products and brands in general was measured on the basis of the consumer novelty seeking scale of Manning, Bearden and Madden (1995). Participants were asked about their interest in searching for new products and brands. This construct was measured to see if differences in levels of novelty seeking would influence the results of co-creation. Respondent had to indicate on a 5-point Likert scale to what extent they agreed with statements like; *I am often looking for new products and services.*

4.5.5 BACKGROUND & CONTROL VARIABLES

Demographical background information was asked for, age, gender and level of education.

Involvement in the product categories was used as a control variable. With this construct there was tried to find out to what extent people were interested in the displayed products in general. Product category involvement can have influence on the general attitude and behavioural intentions of respondent. Therefore it was measured as a control variable, to be sure that no significant differences were there between the eight different conditions. The product category involvement scale was derived from relevant literature (Beatty and Talpade, 1994; Mittal & Lee, 1989; Flynn, Goldsmith & Eastman, 1996). Participants were asked to indicate how much interest they had in ice cream and how relevant the product category is for them.

Brand fit was also used as a control variable for the perceived co-creation fit between the brand and the product (category). This construct was not measured for the zero empowerment versions. The construct, brand fit, was based on the existing literature about co branding fit (Simmons & Becker-Olsen, 2006; Kamins & Gupta, 1994). On a 7-point Semantic differential scale participants had to indicate to what extent they found that it was appropriate that the brand would cooperate with consumers in developing new products and to what extent they found it appropriate or logic that consumers work together with companies for the specific product categories.

The complete questionnaire can be found in appendix D (the questionnaire is in Dutch, because a sample was drawn from the Dutch population).

4.6 RELIABILITY OF THE CONSTRUCTS

To ensure the reliability of the constructs, some of the items were stated negative. Before the data was analyzed, these negative coded items were rescaled. After this a reliability analysis was conducted. For every construct the number of items and the Cronbach's alpha's are displayed in table 5.

Table 5: Reliability of the constructs

	N items	Alpha	If item deleted	Alpha	N items	N
Brand attitude	4	.864		.864	4	220
Customer orientation	5	.768		.768	5	220
Overall brand equity	4	.753		.753	4	220
Brand buy intentions	5	.894		.894	5	220
Brand positive WOM	2	.862		.862	2	220
Product attitude	3	.867		.867	3	220
Product advantage	4	.548	<i>This product is of higher quality than competing products.</i>	.779	3	220
Product quality	5	.881		.881	5	220
Product buy intentions	5	.746		.746	5	220
Product positive WOM	2	.863		.863	2	220
Product co-creation fit	2	.787		.787	2	168*
Involvement	2	.903		.903	2	220
Novelty seeking	4	.845		.845	4	220

* The co-creation fit is not measured in the zero empowerment conditions, because in this condition no co-creation was presented. Therefore the number of respondents is N=168.

The reliability of the constructs seems (after deletion of one item) to be sufficient. Therefore is it possible to conduct further analysis for the constructs.

5. RESULTS

Results of the analyses will be discussed in this section. First of all the results of the control variables will be examined. After that, the results of the independent variables will be discussed, structured on the basis of the main effects, interactions effects and moderating effects on brand perceptions, product perceptions and behavioural intentions.

5.1 RESULTS OF THE CONTROL VARIABLES

First of all there is conducted a one way ANOVA to test whether there were significant differences in the involvement of the respondents in the product categories for the eight different conditions, because, as is general known in scientific research, involvement has an influence on attitudes.

Results of the one way ANOVA show that there are no significant differences between the eight conditions in levels of involvement [$F(7, 213)=.454, p=.866$]. This means that there can be made the assumption that there are no large differences in levels of involvement in the two different product categories that could be of influence on the results.

The control variable co-creation fit was used to test whether there were actually perceived differences in the co-creation fit for the simple and the highly complex product. To test the control variable co-creation fit for the two product types there has been conducted an independent sample T-test. Results of the test show that there are no significant differences in perceived co-creation fit for the simple product ($M=5.78, SD=1.14$) and the highly complex product ($M=5.52, SD=1.14; t(167)=1.48, p=.142$). This means that the respondents did not perceive a lower fit for co-creating with consumers in the highly complex product. This could be of influence on the results of the moderating effects of product complexity. Significant results in those analyses cannot be subscribed to the perceived fit of the products in co-creation.

5.2 EFFECTS FOR CO-CREATION

Two, one way between groups multi analysis of variances (MANOVA) were performed to investigate main effects and group differences between selection by the company and selection by the consumer as well as group differences between development by the company and development by the consumer. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity, with no serious violations noted (Pallant, 2010). Table 6 and 7 provide an overview of mean scores and standard deviations for the main effects of selection and development and the interaction effects of selection and development per depended variable.

Table 6: Means and standard deviations for the conditions selection and development (Main effects)

	Selection by the company	Selection by the consumer	Development by the company	Development by the consumer
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
<i>Product attitude</i>	4.68 (1.11)	4.99 (1.30)	4.72 (1.25)	4.96 (1.20)
<i>Product quality</i>	3.25 (0.77)	3.36 (0.77)	3.30 (0.93)	3.30 (0.87)
<i>Product advantage</i>	2.75 (0.92)	3.02 (0.91)	2.67 (0.78)	3.10 (0.76)
<i>Brand attitude</i>	4.32 (1.07)	4.59 (1.06)	4.40 (1.10)	4.51 (1.04)
<i>Customer orientation</i>	3.29 (0.76)	3.65 (0.68)	3.20 (0.69)	3.75 (0.69)
<i>Overall brand equity</i>	2.52 (0.64)	2.73 (0.71)	2.59 (0.74)	2.67 (0.63)
<i>Product buy intentions</i>	2.73 (0.75)	2.86 (0.82)	2.72 (0.78)	2.88 (0.79)
<i>Product positive word of mouth</i>	2.63 (1.00)	2.88 (1.03)	2.78 (1.07)	2.73 (0.99)
<i>Brand buy intention</i>	2.77 (0.96)	2.86 (0.98)	2.75 (1.01)	2.88 (0.93)
<i>Brand positive word of mouth</i>	2.70 (1.00)	2.90 (0.98)	2.78 (1.03)	2.73 (.095)

Table 7: Means and standard deviations for the depended variables per condition (Interaction)

Product selection (company)			Product selection (consumers)	
Product development (company)		M(SD)		M(SD)
	<i>Product attitude</i>	4.44 (1.11)	<i>Product attitude</i>	4.99 (1.33)
	<i>Product quality</i>	3.12 (0.79)	<i>Product quality</i>	3.48 (0.75)
	<i>Product advantage</i>	2.41 (0.79)	<i>Product advantage</i>	2.92 (1.00)
	<i>Brand attitude</i>	4.16 (1.08)	<i>Brand attitude</i>	4.64 (1.07)
	<i>Customer orientation</i>	2.89 (0.62)	<i>Customer orientation</i>	3.52 (0.62)
	<i>Overall brand equity</i>	2.46 (0.66)	<i>Overall brand equity</i>	2.73 (0.79)
	<i>Product buy intentions</i>	2.62 (0.75)	<i>Product buy intentions</i>	2.81 (0.81)
	<i>Product positive WOM</i>	2.57 (1.02)	<i>Product positive WOM</i>	3.00 (1.07)
	<i>Brand buy intention</i>	2.64 (1.04)	<i>Brand buy intention</i>	2.87 (0.98)
	<i>Brand positive WOM</i>	2.57 (1.02)	<i>Brand positive WOM</i>	3.00 (1.00)
Product development (consumer)		M(SD)		M(SD)
	<i>Product attitude</i>	4.93 (1.08)	<i>Product attitude</i>	5.00 (1.30)
	<i>Product quality</i>	3.37 (0.74)	<i>Product quality</i>	3.24 (0.77)
	<i>Product advantage</i>	3.09 (0.92)	<i>Product advantage</i>	3.11 (0.82)
	<i>Brand attitude</i>	4.49 (1.03)	<i>Brand attitude</i>	4.54 (1.05)
	<i>Customer orientation</i>	3.70 (0.68)	<i>Customer orientation</i>	3.79 (0.70)
	<i>Overall brand equity</i>	2.59 (0.62)	<i>Overall brand equity</i>	2.75 (0.63)
	<i>Product buy intentions</i>	2.85 (0.74)	<i>Product buy intentions</i>	2.92 (0.84)
	<i>Product positive WOM</i>	2.70 (0.98)	<i>Product positive WOM</i>	2.77 (1.00)
	<i>Brand buy intention</i>	2.91 (0.87)	<i>Brand buy intention</i>	2.86 (0.99)
	<i>Brand positive WOM</i>	2.84 (0.96)	<i>Brand positive WOM</i>	2.80 (0.95)

Table 8 provides an overview of the results of the MANOVA for the depended variables and the main effects of selection and development.

Table 8: Overview of MANOVA's for the main effects of selection and development of products

<i>Effects</i>	<i>Depended variable</i>	<i>DF</i>	<i>F</i>	<i>Significance</i>	η^2	<i>Hypothesis rejected or confirmed</i>
Selection	Product attitude	1	3.613	.059	.016	H1 Rejected
	Product quality	1	1.231	.268	.006	H1 Rejected
	Product advantage	1	4.986	.027	.022	H1 confirmed
	Customer orientation	1	16.361	.000	.071	H6 confirmed
	Brand attitude	1	0.581	.447	.003	H6 rejected
	Overall brand equity	1	5.647	.018	.025	H6 confirmed
	Product buy intentions	1	1.466	.227	.007	H11 is rejected
	Product positive WOM	3	1.648	.179	.022	H11 is rejected
	Brand buy intention	1	0.498	.481	.002	H11 is rejected
	Brand positive WOM	1	2.161	.143	.010	H11 is rejected
<i>Effects</i>	<i>Depended variable</i>	<i>DF</i>	<i>F</i>	<i>Significance</i>	η^2	<i>Hypothesis rejected or confirmed</i>
Development	Product attitude	1	2.185	.141	.010	H2 Rejected
	Product quality	1	0.001	.974	.000	H2 Rejected
	Product advantage	1	10.085	.000	.056	H2 confirmed
	Customer orientation	1	37.971	.000	.149	H7 confirmed
	Brand attitude	1	3.492	.063	.016	H7 rejected
	Overall brand equity	1	0.694	.406	.003	H7 rejected
	Product buy intentions	1	2.445	.119	.011	H12 is rejected
	Product positive WOM	1	0.142	.707	.001	H12 is rejected
	Brand buy intention	1	0.968	.326	.004	H12 is rejected
	Brand positive WOM	1	0.068	.794	.000	H12 is rejected

The first hypothesis stated that co-creation in the way of empowering consumers to select the products would have a positive effect on product perceptions, brand perceptions and behavioural intentions. The hypotheses that are partly supported with these results are H1 and H6 which means that product selection by consumers had a positive effect on product advantage ($F(1,217)=4,986$, $p=.027$), customer orientation ($F(1,217)=14,32$, $p=.000$) and overall brand equity ($F(1,217)=5,38$, $p=.022$). An investigation of the mean scores (table 6) indeed confirm the expected results. It appears that, when consumers are empowered to select the products instead of the company, there is a perceived competitive advantage for the product (product advantage) and the brand (overall brand equity) and the company is indeed perceived as significantly more customer orientated. Against the expectations, the other variables (product attitude, product quality, brand attitude and all behavioural intentions) were not affected by customer empowerment to select the products because no significant differences were found. Based on the results, hypotheses H11 has to be rejected.

The second hypotheses stated that co-creation in the way of empowering consumers to develop the product would have a positive effect on product perceptions, brand perceptions and behavioural intentions. The results show significant effects for product advantage ($F(1,217)=12.86$, $p=.000$) and customer orientation ($F(1,217)=35.52$, $p=.000$). Based on those results, hypotheses H2 and H7 are partly confirmed, which implies that product development by consumers had a positive effect on product advantage and perceived customer orientation. Again, the mean scores of those dependent variables confirm (table 6) that product development by consumers show the expected

results. It appears that, when consumers are empowered to develop the products instead of the company, there is a perceived competitive advantage for the product and the company is indeed perceived as more customer orientated. Just as was in the case of selection and against the expectations, the other variables (product attitude, product quality, brand attitude and all behavioural intentions) were not affected by customer empowerment to develop the products because no significant differences were found. Based on the results, hypotheses H12 has to be rejected.

The variables product attitude, product quality, brand attitude and behavioural intentions did not show significant results, for neither selection by consumers as development by consumers. Perhaps, these variables are more influenced by the brand (the brand name, logo and advertisement), product (packaging and name) and its appearance itself, than by the fact that consumers were involved in the development process of the products. Mean scores in table 6 show that the general attitude towards the brand and product was low.

A one way between groups multi analysis of variance (MANOVA) was performed to investigate *interaction effects* of product selection (company versus consumers) and product development (company versus consumers) and to investigate if higher levels of customer empowerment will lead to more positive effects. Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity, with no serious violations noted (Pallant, 2010). Table 9 provides an overview of the results of the MANOVA for the depended variables and the interaction effects of selection and development.

Table 9: Overview of MANOVA's for the interaction effects of selection x creation of products

Effects	Depended variable	DF	F	Significance	η^2	Hypothesis rejected or confirmed
Selection x development	<i>Product attitude</i>	1	2.164	.143	.010	H3 Rejected
	Product quality	1	5.418	.021	.024	Although significant, H3 is rejected
	Product advantage	1	4.114	.044	.019	H3 Confirmed
	Customer orientation	1	9.346	.003	.041	H8 confirmed
	<i>Brand attitude</i>	1	2.323	.129	.011	H8 rejected
	<i>Overall brand equity</i>	1	0.325	.569	.001	H8 rejected
	<i>Product buy intentions</i>	1	3.213	.074	.015	H13 is rejected
	<i>Product positive WOM</i>	1	1.762	.186	.008	H13 is rejected
	<i>Brand buy intention</i>	1	1.172	.280	.005	H13 is rejected
	<i>Brand positive WOM</i>	1	3.213	.074	.015	H13 is rejected

The hypotheses for the interaction effects of product selection and product development predicted that higher levels of customer involvement (the highest level is the level where consumers are empowered to select and develop the products) would cause more positive product perceptions, brand perceptions and behavioural intentions. The MANOVA showed that significant effects were found for product quality ($F(1,217)=5.41$, $p=0.021$), product advantage ($F(1,217)=4.11$, $p=.044$), and customer orientation ($F(1,217)=9.35$, $p=.003$). Figures 7, 8 and 9 show the interaction effects for the significant depended variables.

Figure 7: Interaction effects of product selection and product development on product quality

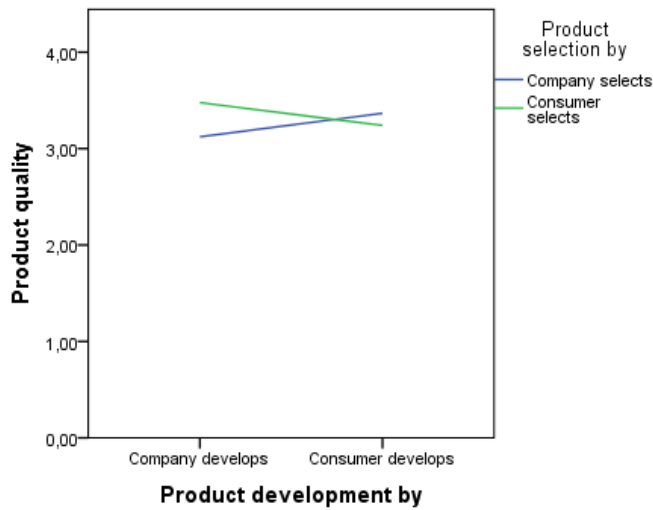


Figure 8: Interaction effects of product selection and product development on competitive advantage

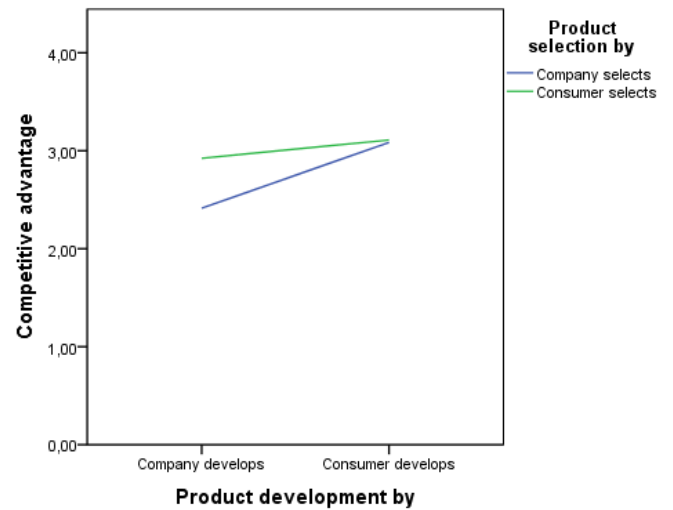
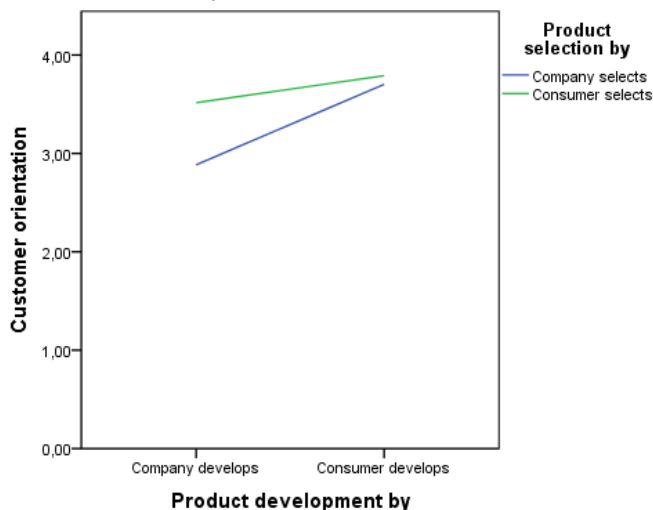


Figure 9: Interaction effects of product selection and product development on customer orientation



The interaction effects for product quality are displayed in figure 7. First of all, as shown in the figure, customer involvement is influencing the product quality positively in comparison to no involvement of consumers. However it does not show that higher levels of consumer involvement also lead to a higher perceived quality of the product. Like the means show in table 7, product quality is perceived the highest when the consumer is only empowered to select the products (where the company thus develops the product). This may imply that product quality depends on the knowledge of the experts, the company. The highest level of customer empowerment, whereby the consumer develops the products and selects which product should be produced does not lead to the highest perceived quality. Therefore, although the results show significant effects, hypothesis H3 has to be partly rejected. Perhaps it may be that people do perceive the company as more knowledgeable and therefore perceive the products to be of higher quality when the company creates the ideas.

The interaction effects for product advantage (competitive advantage) are displayed in figure 8. The graph shows that, no involvement of consumers indeed lead to the lowest levels of perceived

competitive advantage for the product. Mean scores in table 8 show that the highest level of involvement (development and selection by consumers) leads to the highest perceived competitive advantage. But it does not seem to make a difference, when the consumer has developed the product, who selects the product. It seems that a competitive advantage is already reached when the consumer is involved in only one stage of the development process. However, the most effective one is the development of the product by consumers. That is probably because people have the feeling that their needs are considered best in that stage. It does not seem that selection by the consumer or the company influences the competitive advantage very much when the consumer is already empowered to develop the products. However, also here, although the effects are significant, the differences between the levels of involvement are very small.

The interaction effects for customer orientation are displayed in figure 9. The graph shows that higher levels of co-creation do lead to higher perceived customer orientation. Especially when the consumer has developed the product, people perceive the company as significantly more customer orientated. But also selection of the products already leads to the feeling that the company is more customer orientated than it is in the case of no involvement of consumers at all. Again it seems that it does not matter much if the company or the consumers select the product when the consumer already has developed it.

The variables product attitude, product quality, brand attitude and behavioural intentions again did not show significant results. As said before, perhaps, these variables are more influenced by the brand (the brand name, logo and advertisement), product (packaging and name) and its appearance itself, than by the fact that consumers were involved in the development process of the products.

5.3 MODERATING EFFECT OF PRODUCT COMPLEXITY

Two one way between groups multi analysis of covariance (MANCOVA) were performed to investigate the moderating effect of product complexity for co-creation in the way of selecting products and co-creation in the way of developing products). Preliminary assumption testing was conducted to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity, with no serious violations noted (Pallant, 2010). Table 10 provides an overview of means scores and standard deviations for of the conditions (selection and development) per level of complexity for each of the depended variables.

Table 10 : Means and standard deviations for selection, development and product complexity

		Selection (company)	Selection (consumers)	Creation (company)	Creation (consumers)
		M (SD)	M (SD)	M (SD)	M (SD)
Simple Product	Product attitude	4.83 (1.12)	5.08 (1.47)	4.81 (1.33)	5.09 (1.30)
	Product quality	3.18 (0.80)	3.55 (0.73)	3.33 (0.83)	3.40 (0.75)
	Product advantage	2.53 (0.93)	2.99 (1.00)	2.52 (0.99)	3.00 (0.94)
	Brand attitude	4.19 (1.16)	4.57 (1.11)	4.20 (1.22)	4.45 (1.08)
	Customer orientation	3.14 (0.71)	3.67 (0.66)	3.14 (0.69)	3.63 (0.70)
	Overall brand equity	2.40 (0.68)	2.74 (0.78)	2.40 (0.81)	2.65 (0.68)
	Product buy intentions	2.69 (1.00)	2.99 (1.11)	2.68 (1.07)	3.00 (1.05)
	Product positive WOM	2.58 (1.00)	2.87 (1.02)	2.71 (1.10)	2.75 (0.95)
	Brand buy intention	2.86 (0.99)	3.19 (1.07)	2.92 (1.10)	3.14 (0.98)
	Brand positive WOM	2.63 (1.00)	2.93 (1.04)	2.68 (1.12)	2.88 (0.95)
Highly Complex Product		M (SD)	M (SD)	M (SD)	M (SD)
	Product attitude	4.52 (1.09)	4.91 (1.12)	4.61 (1.17)	4.82 (1.08)
	Product quality	3.32 (0.74)	3.17 (0.75)	3.27 (0.75)	3.22 (0.75)
	Product advantage	2.99 (0.85)	3.03 (0.82)	2.82 (0.85)	3.21 (0.79)
	Brand attitude	4.47 (0.95)	4.61 (1.02)	4.47 (0.96)	4.58 (1.01)
	Customer orientation	3.46 (0.79)	3.64 (0.70)	3.46 (0.69)	3.88 (0.66)
	Overall brand equity	2.66 (0.57)	2.73 (0.64)	2.70 (0.64)	2.70 (0.57)
	Product buy intentions	2.79 (0.29)	2.75 (0.35)	2.76 (0.31)	2.78 (0.34)
	Product positive WOM	2.69 (0.35)	2.88 (1.05)	2.85 (1.03)	2.73 (1.03)
	Brand buy intention	2.67 (0.93)	2.54 (0.76)	2.59 (0.90)	2.62 (0.78)
	Brand positive WOM	2.79 (1.00)	2.86 (0.91)	2.89 (0.94)	2.77 (0.96)

Table 11 provides an overview of the results of the MANOVA for the depended variables and the moderating effect of complexity for selection and creation.

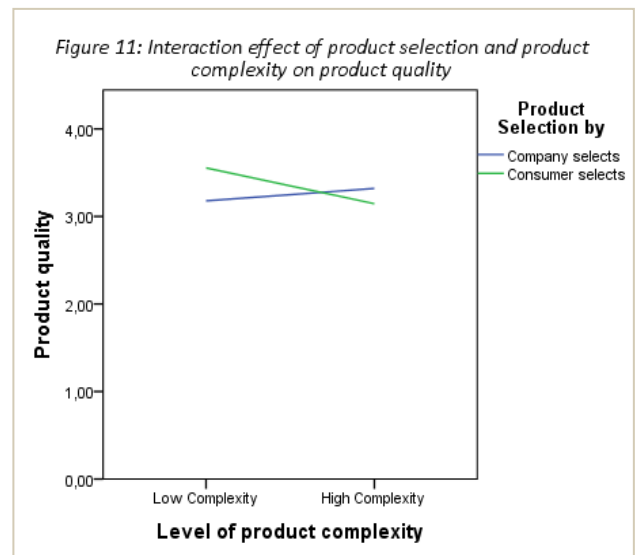
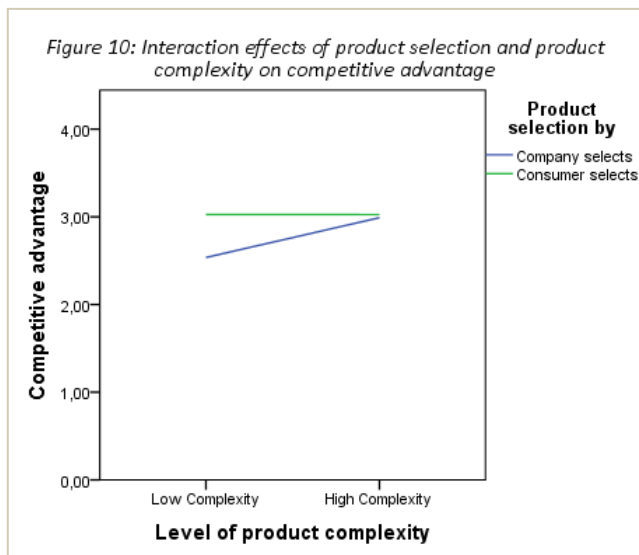
Table 11: Overview of MANOVA's for the moderating effect of product complexity

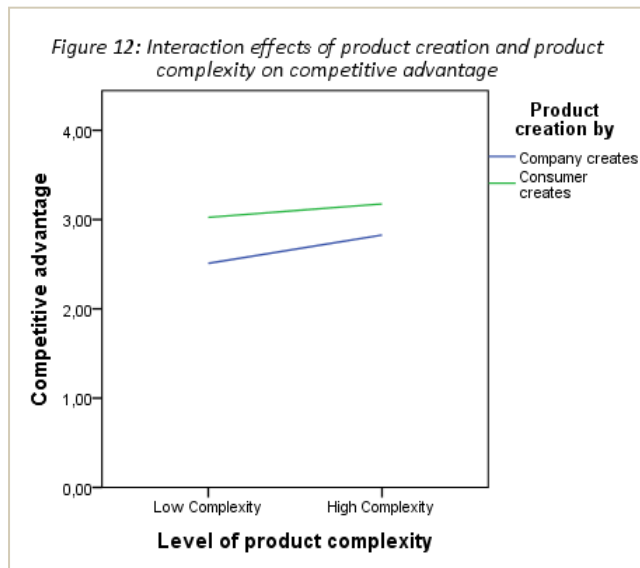
Effects	Depended variable	DF	F	Significance	η^2	Hypothesis rejected or confirmed
Selection x complexity	Product attitude	2	1.968	.142	.018	H4 Rejected
	Product quality	2	4.087	.018	.037	H4 partly confirmed
	Product advantage	2	3.957	.021	.036	Although significant H4 is rejected
	Brand attitude	2	0.674	.413	.003	H9 rejected
	Overall brand equity	2	2.070	.152	.010	H9 rejected
	Product buy intentions	2	2.061	.130	.019	H14 is rejected
	Product positive WOM	2	1.627	.199	.015	H14 is rejected
	Brand buy intention	2	2.002	.138	.018	H14 is rejected
	Brand positive WOM	2	1.415	.245	.013	H14 is rejected

Effects	Depended variable	DF	F	Significance	η^2	Hypothesis rejected or confirmed
Development x complexity	<i>Product attitude</i>	2	1.137	.323	.011	H4 Rejected
	<i>Product quality</i>	2	0.185	.831	.002	H4 partly confirmed*
	<i>Product advantage</i>	2	7.312	.001	.064	Although significant H4 is Rejected
	<i>Brand attitude</i>	2	0.059	.809	.000	H9 rejected
	<i>Overall brand equity</i>	2	0.711	.400	.007	H9 rejected
	<i>Product buy intentions</i>	2	2.106	.124	.019	H14 is rejected
	<i>Product positive WOM</i>	2	0.237	.789	.002	H14 is rejected
	<i>Brand buy intention</i>	2	0.779	.460	.007	H14 is rejected
	<i>Brand positive WOM</i>	2	0.744	.477	.007	H14 is rejected

* Partly confirmed because selection of product did find the expected effects.

The hypotheses about product complexity stated that the effects for selection and/or development by consumers would be influenced by product complexity. It was predicted that co-creation (e.g. selecting products by consumers and developing products by consumers) would have a less positive effect for highly complex products because of the knowledge that is necessary to develop those products. Complexity shows a moderating effect for selection on the variables product quality ($F(2,213)=4.09$, $p=.018$) and competitive advantage ($F(2,213)=3.96$, $p=.021$). Figures 10, 11 and 12 show the interaction effects for the significant depended variables.





The moderating effect of product complexity for the variable competitive advantage is displayed in figure 10. The figure shows that it does make a difference for the simple product if the consumer or the company has selected the product. A higher competitive advantage is reached when the consumer is empowered to select the product. This implies that people value the product better compared to other similar products when consumers have the ability to select the product that they think fit their needs best. Co-creation in the way of product selection by consumers in the highly complex product does not result in a significant lower competitive advantage, as first was expected. But, mean scores show that there is also not reached a higher competitive advantage when the consumers can select the highly complex product. It does not seem to have greater value whether the consumer or the company selects the product. This implies that co-creation in the way of selecting by consumers for the highly complex product does not result in less advantage compared to other similar products. The fact that all scores for competitive advantage are higher (selection by consumers, selection by the company) for the highly complex product compared to the simple product indicates that highly complex products are more suitable for co-creation than at first was expected. These effects are contradicting to the expected hypotheses

The moderating effect of product complexity for product quality is displayed in figure 11. The figure for product quality shows a different interaction effect than for competitive advantage. The quality of the simple product seems to be higher when the consumer selected the product instead of the company. The opposite effect, in the expected direction, takes place for the highly complex product. Thus, co-creation in the way of selecting products by consumers leads to lower perceived quality of products. Hypothesis H4 can therefore be partly confirmed (selection has an interaction effect with complexity). So it could be that, although there was a perceived co-creation fit for the highly complex product category, consumers unconsciously perceived a higher quality when the company selects the product because the company is the expert and probably has more knowledge of which products should be produced to be of high quality.

An investigation of the moderating factor product complexity in the case of the condition product development show significant results for competitive advantage ($F(2,213)=7.31, p=.001$). The moderating effect of product complexity for competitive advantage is displayed in figure 12. For both complexity levels, the simple and the highly complex product, there seems to be a perceived competitive advantage when the consumer has developed the product instead of the company.

However, very little differences are there between the two product types (where the highly complex product even scores higher), which means that product development by consumers for highly complex products does not result in less positive effects, which is contrary to the expected result.

Based on these findings about the moderating effect of product complexity, the only hypothesis that can be (partly) confirmed is hypothesis H4. Complexity does have a moderating effect on product quality for the selection of products in the expected direction, which implies that, the expert is the one with the most knowledge to develop products of high quality. Although the variable competitive advantage for both selection and development did show significant effects, it was not in the expected direction; therefore those hypotheses have to be rejected. Against the expectations, and just like it was the case without complexity as a moderator, the other variables (product attitude, brand attitude, customer orientation, brand equity and all behavioural intentions) were not affected by product complexity products because no significant differences were found. Perhaps these results can be subscribed to the fact that people consciously perceived a good fit for the highly complex product to be co-created with consumers.

5.4 MODERATING EFFECT OF NOVELTY SEEKING

The influence of novelty seeking as a moderator for co-creation effectiveness was measured with a multivariate analysis of variance (MANOVA) to test whether the level of novelty seeking of consumers has an influence on the results of co-creation effects. The independent variables were co-creation (no consumers involved versus consumers involved in the development process of the product) and novelty seeking. Again these MANOVA's were tested on the dependent variables for brand perceptions, product perceptions and behavioural intentions. A median split was used to split the levels of novelty seeking in low and high novelty seekers. For novelty seeking it holds that 46,2% (N=102) scores lower than the median=3 and 53,8% (N=119) scores equal to or higher than the median=3. Table 12 provides an overview of means scores and standard deviations for the conditions (no co-creation/ co-creation) per level of novelty seeking for each of the depended variables.

Table 12: Means and standard deviations the depended variables for co-creation and novelty seeking

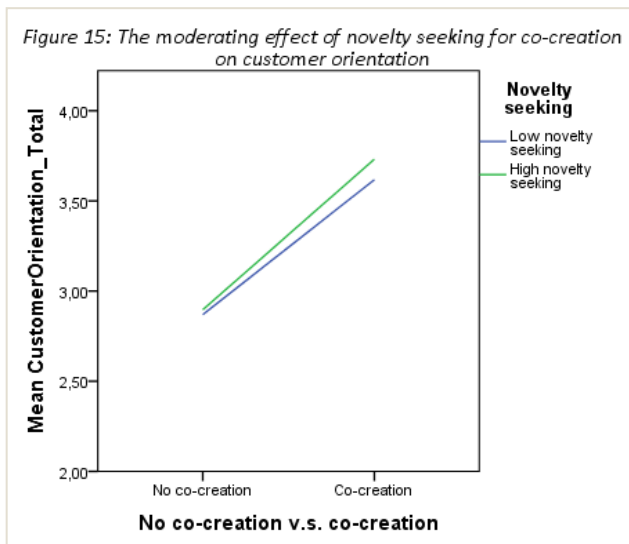
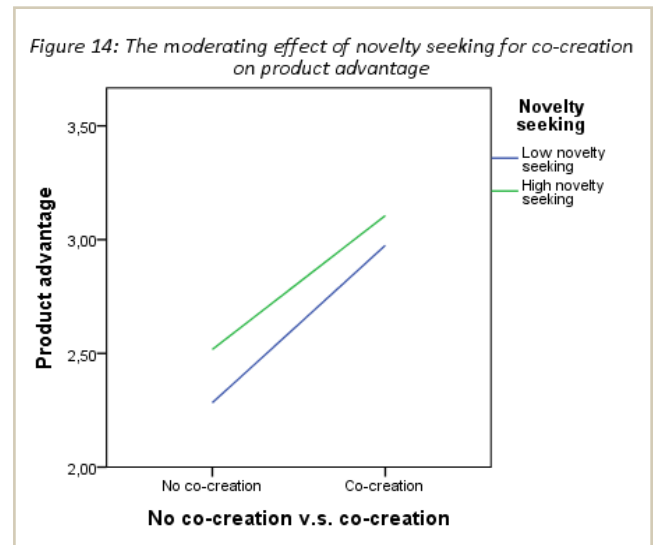
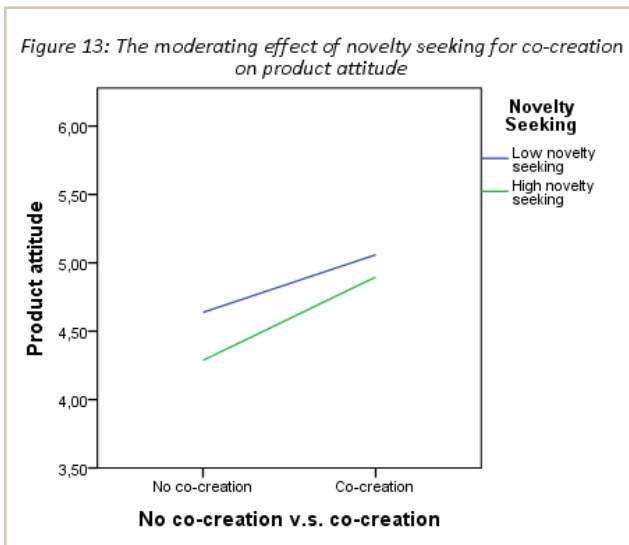
No co-creation			Co-creation	
Low Novelty Seekers		M (SD)		M (SD)
	Product attitude	4.64 (1.18)	Product attitude	5.06 (1.08)
	Product quality	3.17 (0.81)	Product quality	3.46 (0.67)
	Product advantage	2.28 (0.72)	Product advantage	2.97 (0.86)
	Brand attitude	4.27 (0.95)	Brand attitude	4.54 (0.95)
	Customer orientation	2.87 (0.49)	Customer orientation	3.62 (0.68)
	Overall brand equity	2.48 (0.67)	Overall brand equity	2.65 (0.72)
	Product buy intentions	2.60 (0.70)	Product buy intentions	2.84 (0.78)
	Product positive WOM	2.70 (0.97)	Product positive WOM	2.72 (0.99)
	Brand buy intention	2.62 (0.99)	Brand buy intention	2.77 (0.93)
	Brand positive WOM	2.70 (0.99)	Brand positive WOM	2.79 (0.90)
No co-creation			Co-creation	
High Novelty Seekers		M (SD)		M (SD)
	Product attitude	4.29 (1.03)	Product attitude	4.90 (1.35)
	Product quality	3.08 (0.78)	Product quality	3.26 (0.81)
	Product advantage	2.52 (0.84)	Product advantage	3.10 (0.95)
	Brand attitude	4.07 (1.19)	Brand attitude	4.56 (1.13)
	Customer orientation	2.90 (0.70)	Customer orientation	3.78 (0.67)
	Overall brand equity	2.44 (0.66)	Overall brand equity	2.73 (0.65)
	Product buy intentions	2.64 (0.80)	Product buy intentions	2.88 (0.82)
	Product positive WOM	2.47 (1.07)	Product positive WOM	2.90 (1.04)
	Brand buy intention	2.65 (0.66)	Brand buy intention	2.97 (0.95)
	Brand positive WOM	2.47 (1.06)	Brand positive WOM	2.94 (1.02)

Table 13 provides an overview of the results of the MANCOVA for the depended variables and the moderating effect of complexity for selection and creation.

Table 13: Overview of MANCOVA's for the moderating effect of novelty seeking

Effects	Depended variable	DF	F	Significance	η^2	Hypothesis rejected or confirmed
Co-creation x Novelty seeking	Product attitude	2	3.884	.022	.035	Although significant H5 is rejected.
	Product quality	2	1.826	.164	.017	H5 Rejected
	Product advantage	2	10.300	.000	.087	Although significant, H5 is rejected
	Customer orientation	2	28.784	.000	.210	H10 confirmed
	Brand attitude	2	2.966	.054	.027	H10 rejected
	Overall brand equity	2	2.557	.080	.023	H10 rejected
	Product buy intentions	2	1.832	.163	.017	H15 is rejected
	Product positive WOM	2	1.995	.138	.018	H15 is rejected
	Brand buy intention	2	1.425	.243	.013	H15 is rejected
	Brand positive WOM	2	2.698	.070	.024	H15 is rejected

The hypotheses for novelty seeking predicted that consumers who are high novelty seekers (e.g. often search for new products and new product experiences) are more interested in co-created products than low novelty seekers and therefore have a more positive attitudes and behavioural intentions towards the product and brand. The hypotheses were significant results are found for are H5, and H10, which means that product selection by consumers had a positive effect on product attitude ($F(2,217)=3.88, p=.022$), product advantage ($F(2,217)=10.30, p=.000$) and customer orientation ($F(2,217)=28.78, p=.000$). Figures 13, 14 and 15 show the interaction effects for the significant depended variables.



The means in table 12 show that low novelty seekers have a higher attitude towards the product (for both conditions) than high novelty seekers have. In figure 13, the moderating effects of novelty seeking for product attitude are displayed. As shown in the figure, the difference in level of novelty seeking itself does not influence the product attitude, but the difference between the not co-created product and the co-created products do. An unexpected result is the fact that low novelty seekers have a more positive attitude towards the co-created product than high novelty seekers have. The hypothesis cannot be confirmed therefore. A possible explanation for this result could be

that the people who are high novelty seekers do not find co-created product more novel than non co-created products and therefore are less interested in it.

An investigation of the means for product advantage (table 12) shows almost the same effects. Again for both levels of co-creation, product advantage is significantly higher when the product is co-created with consumers. However, figure 14 shows that, for product advantage, high novelty seekers in general perceive the products to be of a higher competitive advantage than low novelty seekers. Still, these effects do not show the predicted effects, that high novelty seekers perceive the non co-created product as a product with lower competitive advantage than low novelty seekers do, the hypotheses has to be rejected. Again, this fact may be subscribed to the fact that the co-created product is not seen as a very novel product in comparison to a non co-created product.

The variable customer orientation shows the results as was predicted in the hypothesis. Insights in the mean scores (table 12) show that high novelty seekers do perceive the brand that has co-created the product as more customer orientated than low novelty seekers. Figure 15 give some more insights in the differences. Where the non co-created brand is not perceived really different by the levels of novelty seeking of people, the co-created brand is. Hypothesis 10 is confirmed.

Against the expectations, the other variables (product quality, brand attitude, brand equity and all behavioural intentions) were not affected by product complexity products because no significant differences were found. Based on these results, hypotheses H5 and H15 have to be rejected. Perhaps these results can be subscribed to the fact that the non co-created product also was introduced as a new product and therefore was not perceived any different for low novelty seekers and high novelty seekers.

6. DISCUSSION

In the highly competitive consumer good markets it is important to stand out and address the specific needs of consumers efficiently and effectively. The primary goal of this study was to get a better understanding and insights in the effects of co-operation with consumers in the development of new products. This is done from a point of view that has been researched very little yet, namely that of the consumer that does not participate in co-creation activities but is exposed to the brands and products where co-creation is been applied. Special attention was given to the context product complexity for co-creation. The main question that was tried to answer with this research was: *What are the effects of co-creation with consumers in new product development on the brand and product perceptions of consumers who are exposed to it?* This research question has is researched by conducting an online experiment wherein the effects of co-creation were measured, where different levels of involvement with consumers and levels of product complexity predominated. This discussion will examine the findings of the study and present theoretical and practical implications that will be discussed together with the limitations of this study and suggestions for future research.

6.1 THEORETICAL AND PRACTICAL IMPLICATIONS

The results of this research show some interesting findings. The general conclusion with regard to the implementation of co-creation in new product development is that co-creation does have an effect on the perceptions of consumers about the brand and product. Consumers who are not involved in the co-creation processes to develop new products, but exposed to those products and brands, indeed perceive products and brands differently based on their awareness that co-creation had been applied for that product. In comparison to a company that does not involve consumers in the development process of new products, this research has shown that co-creation can give some important advantages for a company.

The first and most important result (on the basis of its effect size) is the fact that co-creation with consumers has influence on the perceived customer orientation of a company. It is found that all levels of consumer involvement (e.g. empowerment to select products, empowerment to develop products and full empowerment, selecting and developing products) lead to higher perceived customer orientation in comparison to the condition were no consumers are involved (zero empowerment of consumers). These findings are in line with the findings of Fuchs and Schreier (2010). In the traditional way of product development, where companies exert “too” much control over consumers and are more trying to convince and seduce consumers than actually try to help them and satisfy consumers needs, consumers are more skeptic about companies and markets (Fuchs & Schreier, 2010; Holt, 2002). This research proved that, giving consumers some of the control and the opportunity to share their needs and, more specific, their ideas with the company has an impact on other consumers’ perceptions about the customer orientation of the brand. The involvement of consumers in the development process give consumers who are exposed to those products the idea that the company tries to figure out what their wishes are and really want to discuss those wishes with them. The skepticism about products and companies is decreased because consumers do have the feeling that the company has their best interest in mind. Co-creation (e.g. the way companies behave and develop their products) thus impacts the way a company is perceived in the market. And, as consumers are the ones that have to benefit from the products, it would make sense to let them develop and select the products, to make them fit their needs (Fuchs & Schreier, 2010). Customer involvement in the development of new products could be used as an effective “tool” to strengthen customer relations and brand image, with regard to customer orientation.

Thereby can full empowerment of consumers (e.g. developing and selecting the products) be used to produce the highest level of customer orientation. But the results show that, even selecting by consumers only, cause higher perceived customer orientation, although effect sizes show that products that are developed by consumers have a more positive effect on customer orientation. The plausible explanation for this is the fact that consumers who are really empowered to develop the products are getting the opportunity to discuss their needs with the company and therefore the company will be perceived as showing higher customer orientated behavior. For companies that do not want to give consumers the control over the development process of products it would be interesting to use selection of products as a tool to gain advantage over other brands, which do not involve their consumers in any way.

This research further provided evidence for the fact that a competitive advantage can be reached for the product. Consumers apparently do perceive that a product has some unique features when it is co-created with consumers, as the results show for the variable competitive advantage. Just like it was in the case for customer orientation, all levels of customer involvement lead to higher perceived competitive advantage in comparison to the condition where only the company decides which products are produced. Especially product development by consumers had influence on the advantage of a product. But the differences in the three empowerment levels were not significant. So, it is questionable if it really is interesting to give consumers all the empowerment in the product development process. Only partly empowerment of consumers already show that products possibly fit the consumers needs better. For companies it is important to know that people do perceive an advantage over other competitive products, which could mean that consumers may consider buying the product earlier.

Contrary to the results of Fuchs and Schreier (2010) this research did not provide evidence that co-creation and customer orientation lead to better corporate and product attitudes and make people more willing to buy the products or spread positive word of mouth about it. A plausible explanation for these results may be the fact that co-creation may not influence these attitudes at all. Perhaps co-creation does not have such a great effect on consumers' attitude towards a brand or product when they are not actively involved but only exposed to co-created products. Consumers may be aware of the fact that products are co-created with consumers when they look at the advertisement, but they do not consider it in their overall brand and product evaluation, because the actual product and brand plays a role and not only the development process of the product. According to Ajzen and Fishbein (2000) an attitude encompasses an evaluation and reflects the feeling towards something. So, evaluations are based on their feeling towards the brand and product. Although they might like the fact that the brand co-creates with consumers, their first impression about the brand and product may influence their overall attitude. Results of the correlation between the variables show that attitudes strongly correlate with behavioural intentions, which implies that low attitudes towards the products turn out in low behavioural intentions. However, what could even have a larger effect on attitudes and behavioural intentions is the fact that an unknown brand was used for this research and people had to give their opinion about it only on the basis of an advertisement. Füller and Matzler (2007) stated that only on the basis of really experiencing a new product and its features, consumers are able to identify if they actually like the product and whether it fulfills a need. In general the attitudes and behavioural intentions were low, regardless of the involvement of consumers in the development process, which may imply that people did not like the brand, which influenced their attitudes and behavior. The fact that it was a fictitious brand made it difficult for people to value the brand and product on the basis of a very little

amount of features. According to Ajzen and Fishbein (2000) attitudes are developed through acquiring information about the product or brand. However, more features about the product or brand could also have influenced the results. So, to be on the save side, there is chosen to display as less information as possible about the product and brand. In this way the focus lied on co-creation. The fact that the fictitious product was not co-created in reality plays a role, which could mean that the needs of consumers were not met at all with those products.

Another possible explanation for the fact that no results were found for those variables may be the knowledge of consumer in the co-creation processes. Although consumers are able to create new ideas, which are probably more original and valuable, attitudes and behavioural intentions may be influenced by the fact that professional experts (or even advanced users) create ideas that are more easily reliable for consumers and therefore have some advantages in comparison to co-created products (Kristensson,, Gustafsson & Archer, 2004).

With regard to co-creation for highly complex products, it seemed that consumers do not perceive co-creation less appropriate for those products. People consciously perceived a good fit for the complex product. They did not find it inappropriate or not logical that consumers were involved in the development of a highly complex product like computer software. It may be that co-creation is not that inappropriate for highly complex products as expected.

However, the results did show that selection and development by either the consumer or the company has had an effect on the competitive advantage and quality of the product for the two different product categories. Product quality for the complex product was higher when the company had selected the product, instead of the consumer. It seems that this result cannot be subscribed to the fit for co-creation but to the complexity itself. This can be explained by the fact that people maybe consciously think that co-creation fit with the highly complex product category, but unconsciously still have the idea that the company has more knowledge to develop those kind of products and therefore find, for example, the product quality higher when the company traditionally developed or selected the product. They may have the feeling that consumers do not have enough knowledge to select which product has the best features.

The results for the different empowerment levels show that, when the consumer has developed and selected the product, thus had full empowerment, there is a difference between the simple and the highly complex product. It thus does seem that expertise unconsciously does play a role in the effectiveness of co-creation for highly complex products. When the consumers have all the empowerment over the chosen product, it seems that quality and advantage are much lower. The conclusion that can be drawn for this result is that co-creation does seem to have positive effect when it is applied for highly complex products. The fact that products are aligned with the needs and expectations of consumers, give a higher competitive advantage. But trough the fact that consumers do not have the expertise that a company has, products are evaluated better when the company has still some empowerment in the development process. For the highly complex product categories it would therefore be interesting to give consumers some empowerment, however, it is important to keep in mind that people find that the expertise of the company is playing an important role. Letting consumer develop the products would be interesting to use, because consumers can discuss their needs and ideas with the company, but eventually the company is the one who uses her expertise and knowledge to select the product with the highest quality. In this way the company can obtain a competitive advantage over other similar products because the product will fit better to the customers' needs.

The explanation for the fact that the results for the other variables were not in the expected direction (highly complex product were expected to be less appropriate for co-creation) can be explained by the shift in consumer knowledge. With the advent of the internet people get the feeling that they can gain a lot of knowledge and therefore find that they themselves have sometimes more knowledge than the experts. This means that the knowledge of the experts is doubted, and therefore is not that important anymore for consumers.

Another possible explanation for contradicting results for the fact that highly complex products also have some advantages when consumers are involved in the development process is, that people have the feeling that still the company has much to say about the product in the end and that therefore the products still have the advantages of meeting consumers needs, but the knowledge that is necessary for developing the actual product may be perceived as derived from the company. The experiment in this research revealed only little over the co-creation process that had taken place. So people did not know how much consumers in reality had to tell about the product that had been produced.

The moderating effect of novelty seeking showed the expected results for customer orientation, however, contrary to the other predicted hypothesis novelty seeking did not show effects in combination with co-created products. It does not seem that people who are often searching for new products and information about new products also evaluated co-created products as more innovative products. The co-created product is probably not seen as more innovative and new, which results in fewer intentions to buy the product earlier than people who are not seeking for new products and product experiences. The fact that the product which was developed and selected by the company also was introduced as a new product could have influenced these results. In that way, both products could be perceived as new products.

The fact that novelty seeking does not influence brand attitudes and brand related behavioural intentions can also be subscribed to the fact that novelty seeking is probably more a product related factor than a brand related factor. This research was more focused on the innovativeness of the product than the brand and therefore the brand was not perceived as something novel.

6.2 LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Although this study has proven that co-creation might be an interesting opportunity for companies, a number of factors might limit the interpretation and generalizability of the results and warrant discussion. Based on the findings in this research there can also be made some suggestions for future research.

First, although this research shows that empowerment of consumers produce some favorable results in the context of the product categories ice-cream as a simple product and computer software as a highly complex product, these findings cannot be generalized to every product category. What are the effects of co-creation in different product categories and products with different price ranges? Only the effects for customer orientation should not be influenced by the product category, but attitudes, quality and behavioural intentions might be influenced by the underlying product categories.

Second, on the basis of this research one cannot make any claims for existing brands, since this study only focused on a fictitious brand. Further research has to prove whether co-creation has

the same effects on already established brands. Outcomes could be different due to the fact that the brand already has a certain brand image. Co-creation may be less or more effective for an unknown brand. People do not actually know what to expect about such a brand because they never tried it before. So, it could be that co-creation could have better effects for the more established brands. In general there is already more word of mouth about those brands. But, co-creation could also be more negative for those established brands. An interesting focus for a study may be the brand image. What if co-creation would be applied for a “famous” brand? It may be that a brand like that would not be seen as appropriate for co-creation. According to Etgar (2002) a product may lose, through the use of co-creation, its social and psychological advantage of using the brand. The advantages of those brands might even decrease through co-creation. It could be that (participating) consumers do not even want to actively participate in co-creation processes for those already established brands.

Third, and as said before, the fact that a fictitious brand was used could have had influence on the results. Respondents had to give their opinion about the brand on the basis of only a short introduction and advertisement about the brand. The same brand was used for both products to minimize the possibility that respondents were influenced by the brand and layout of the advertisements. However, it could be that the brand was perceived as more appropriate for the one or the other. Attitudes and behavioural intentions could be influenced by their impressions of the logo and name of the brand and therefore, co-creation could have an effect, however, those other factors could have played a more important role in their first impression and opinion. Some reactions of respondents showed that they did not like the name of the brand for ice-cream and therefore were more negative about the ice-cream than they would have been when they would have like the brand name. Because of the amount of time that was set for this study there has not been done a pre-study for the attitude about the advertisements of the brand and product for the two different product categories. For future research it would be good to check whether the attitudes towards the advertisement are positive before conducting the main research. Asking about their attitude toward the advertisement could also decrease this limitation. It would be interesting to measure the brand perceptions for an established brand before co-creation has been applied, to see if co-creation actually changes the perceptions about that brand. When experiments are conducted, co-creation will be hard to measure for as well established brands as new brands, because attitudes and behavioural intentions will depend also on the brand. Other research approaches have to be taken into account to limit the influence of this important factor. For established brand, the image will always play a role in the value processes. For a new brand, consumers could be more careful, because they do not know what to expect about the brand. Longitudinal studies would be helpful to measure the effects of co-creation in more natural settings and for measuring the effects of co-creation over time.

Some caution is recommended by the interpretation of the results. One cannot tell whether the respondents have looked at the advertisements thoroughly and for how long the respondents really took the time to read the manipulation. By showing the advertisements twice, the chances that one carefully viewed the ad was tried to increase. The fact that the researcher was not present during the examination of the questionnaire cannot give any guarantee that the respondents have completed the questionnaires truthfully.

For the measurement of competitive advantage for the brand, a scale was used of overall brand equity. However, this scale normally measures brand equity on the basis of only the name of the brand. In this research there was an unknown brand used, so people could not have an image yet on the basis of only the name. Therefore it could be that this scale did not exactly measured what

was intent to measure, namely the competitive advantage of the brand over other brands that do not involve their consumer in the development process of new products.

A final limitation of this research is the fact that the same scales were used to measure brand related behavioural intentions and product related behavioural intentions. Although the scale was adjusted to fit brand and product levels, the statements were much alike. Respondents may have thought that the questions were identical and therefore tried to answer the questions for both dimensions the same.

The way co-creation is communicated can play an important role in the effectiveness of co-creation (also for the different product complexity levels). In this study there has not been communicated what kind of consumers created the product. There was only made clear that consumers were involved in the development process of the product, but not what type of consumers. There could be differences in results when for example lead users are involved in the development process instead of the average consumers. This specific group of consumers may have more knowledge and experience in specific product categories. Especially in the highly complex and technical product categories, those groups of consumers may be perceived as more knowledgeable than an average consumer and therefore could create products of higher quality. The fact that respondents in this study did not know who was involved in the process may be of influence on the results. They could have thought that for the highly complex product, there was cooperated with more knowledgeable consumers. Future research could investigate whether the communication about the involved consumers could affect product perceptions.

A challenging part of co-creation will be the search for the most effective way to communicate it towards the consumer. What involves co-creation with consumers? It is a concept that is going to be applied more and more, but at this stage it is not used often. For consumers to fully understand what co-creation implies, it is useful to clearly communicate about the processes and collaboration that has been taken place. This study had described co-creation very narrow to be sure that the effects of co-creation had not been influence by the way it is communicated. For future research it would be interesting to investigate what the role of communication about co-creation is on its effectiveness. Do companies really have to claim that they have co-created the product with consumers? Or is the focus then too much on convincing consumers that their needs are considered during the development process of the product? According to Chen and Leu (2011), advertisers should use claims in advertisements with caution, because of the fact that consumers are skeptic about advertising. Focus should maybe be more on the quality of the product and that it is fitting the needs of consumers then the marketing of co-creation activities.

It is also interesting to see if sharing information about the co-creation process and actively involving consumers in their communication has an influence on the interpretation and effectiveness of co-creation. The use of social media and user generated content about co-creation processes could be an interesting opportunity for companies.

More qualitative research approaches should explore which factors could be of influence on attitudes of consumers and behavioural intentions. What do consumers find interesting about co-creation and what are their expectations about products that are co-created? With the use of qualitative research approaches more insight could be reached in the way co-creation is interpreted by consumers who are exposed to it.

In this research co-creation had only been applied in the early stages of the product development process. But it can also be applied in other stages. Consumers may be only involved in

the development of the package design, or even later in the stages of a company's development processes, consumers can be involved in the marketing stages of the product. Research should focus on those parts to see if co-creation in those stages also effects perceptions about brands and product and even may influence behavioural intentions.

Overall, this research has provided some useful insights in the indirect effects of co-creating products with consumers. It can be an interesting tool for marketing and branding of a company. But the main and most important purposes of co-creation is developing more creative and qualitative products and give consumers the opportunity to be involved in value creating. This should be the most important reasons for companies to involve their customers in the development processes of new products.

Co-creation is and will be a topic with growing interest, therefore similar studies will be more and more important to get insights in the minds of consumers when co-creation is applied.

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APPENDIX A: PRE-TEST PRODUCT COMPLEXITY (IN DUTCH)

Introductie:

Welkom

Beste respondent,

Fijn dat je mee wilt werken aan deze korte pretest voor mijn Master thesis. De vragenlijst gaat over de complexiteit van producten en bestaat uit enkele korte vragen waarbij je aan moet geven in hoeverre je producten complex vindt. Je gegevens zullen anoniem verwerkt worden.

Dankjewel!

Pagina 1

Achtergrond variabelen

- *Wat is je geslacht?*
 - Man
 - Vrouw

- *Wat is je leeftijd?*
(Open vraag)

- *Wat is je hoogstgenoten opleiding?*
 - Basisonderwijs/Lager onderwijs
 - LBO
 - VMBO/MABO/MULO
 - HAVO
 - VWO/Gymnasium/Atheneum/HBS
 - MBO
 - HBO/Post-HBO
 - WO/Universiteit

Pagina 2

Product complexiteit

De volgende stellingen hebben betrekking op de complexiteit van producten.

Geef voor een tas op een schaal van 1 tot 7 aan in hoeverre je het eens bent met de volgende stellingen

1. Dit is een technisch ingewikkeld product.
2. Het ontwikkelen van een dergelijk product is technologisch zeer veeleisend.
3. Het product vereist kennis om het te installeren/gebruiken
4. Er is technische hulp mogelijk na aanschaf (bijvoorbeeld d.m.v. een handleiding)

Geef voor sportschoenen op een schaal van 1 tot 7 aan in hoeverre je het eens bent met de volgende stellingen

1. Dit is een technisch ingewikkeld product.
2. Het ontwikkelen van een dergelijk product is technologisch zeer veeleisend.
3. Het product vereist kennis om het te installeren/gebruiken
4. Er is technische hulp mogelijk na aanschaf (bijvoorbeeld d.m.v. een handleiding)

Geef voor computer software op een schaal van 1 tot 7 aan in hoeverre je het eens bent met de volgende stellingen

1. Dit is een technisch ingewikkeld product.
2. Het ontwikkelen van een dergelijk product is technologisch zeer veeleisend.
3. Het product vereist kennis om het te installeren/gebruiken
4. Er is technische hulp mogelijk na aanschaf (bijvoorbeeld d.m.v. een handleiding)

Geef voor een fiets op een schaal van 1 tot 7 aan in hoeverre je het eens bent met de volgende stellingen

1. Dit is een technisch ingewikkeld product.
2. Het ontwikkelen van een dergelijk product is technologisch zeer veeleisend.
3. Het product vereist kennis om het te installeren/gebruiken
4. Er is technische hulp mogelijk na aanschaf (bijvoorbeeld d.m.v. een handleiding)

Geef voor thee op een schaal van 1 tot 7 aan in hoeverre je het eens bent met de volgende stellingen

1. Dit is een technisch ingewikkeld product.
2. Het ontwikkelen van een dergelijk product is technologisch zeer veeleisend.
3. Het product vereist kennis om het te installeren/gebruiken
4. Er is technische hulp mogelijk na aanschaf (bijvoorbeeld d.m.v. een handleiding)

Geef voor een televisie op een schaal van 1 tot 7 aan in hoeverre je het eens bent met de volgende stellingen

1. Dit is een technisch ingewikkeld product.
2. Het ontwikkelen van een dergelijk product is technologisch zeer veeleisend.
3. Het product vereist kennis om het te installeren/gebruiken
4. Er is technische hulp mogelijk na aanschaf (bijvoorbeeld d.m.v. een handleiding)

Geef voor een mobiele telefoon op een schaal van 1 tot 7 aan in hoeverre je het eens bent met de volgende stellingen

1. Dit is een technisch ingewikkeld product.
2. Het ontwikkelen van een dergelijk product is technologisch zeer veeleisend.
3. Het product vereist kennis om het te installeren/gebruiken
4. Er is technische hulp mogelijk na aanschaf (bijvoorbeeld d.m.v. een handleiding)

Geef voor meubels op een schaal van 1 tot 7 aan in hoeverre je het eens bent met de volgende stelling.

1. Dit is een technisch ingewikkeld product.
2. Het ontwikkelen van een dergelijk product is technologisch zeer veeleisend.
3. Het product vereist kennis om het te installeren/gebruiken
4. Er is technische hulp mogelijk na aanschaf (bijvoorbeeld d.m.v. een handleiding)

Verstuur

APPENDIX B: MANIPULATIONCHECK

Hoi allemaal,

Zoals de meeste van jullie weten ben ik druk bezig met het afronden van mijn master Communication Studies. In het kader van mijn afstudeeropdracht ben ik bezig met het uitvoeren van een onderzoek. In de startfase hiervan kan ik jullie hulp goed gebruiken! Graag wil ik jullie dan ook vragen bijgevoegde (korte!) vragenlijst in te vullen (duurt slecht 2 minuten).

Via onderstaande link kom je bij vier advertenties waarover steeds twee vragen worden gesteld. Bekijk en lees de advertenties goed voordat je de vragen invult.

www.thesistools.com/AdvertentiesNathalie

Heel erg bedankt alvast voor jullie hulp!

Groetjes, Nathalie

Vragenlijst:

Welkom

Beste deelnemer,

Hierna volgen vier advertenties van het merk 'Alcet' met betrekking tot een nieuwe ijssmaak. Ik zou je graag willen vragen om de advertenties aandachtig te bekijken en te lezen. Na iedere advertentie zijn er twee korte vragen. Tot slot is er na de laatste advertentie nog een extra vraag over het product in de advertenties.

De advertenties zijn op de volgende pagina's te vinden

ADVERTENTIE 1 Consument heeft gekozen

Hieronder staan de vragen die betrekking hebben op de getoonde advertentie.

1. Wie heeft de ijssmaak bedacht? ☐ Alcet ☐ Consument
2. Wie heeft de ijssmaak gekozen? ☐ Alcet ☐ Consument

ADVERTENTIE 2 Consument heeft bedacht

Hieronder staan de vragen die betrekking hebben op de getoonde advertentie.

1. Wie heeft de ijssmaak bedacht? ☐ Alcet ☐ Consument
 2. Wie heeft de ijssmaak gekozen? ☐ Alcet ☐ Consument
-

ADVERTENTIE 3 Geen

Hieronder staan de vragen die betrekking hebben op de getoonde advertentie.

1. Wie heeft de ijssmaak bedacht? ☐ Alcet ☐ Consument
2. Wie heeft de ijssmaak gekozen? ☐ Alcet ☐ Consument

ADVERTENTIE 4 Consument heeft bedacht & gekozen

Hieronder staan de vragen die betrekking hebben op de getoonde advertentie.

1. Wie heeft het ijs bedacht? ☐ Alcet ☐ Consument
2. Wie heeft de ijssmaak gekozen? ☐ Alcet ☐ Consument

De volgende stellingen hebben betrekking op de complexiteit van het product in de advertentie. Lees de stellingen aandachtig en geef daarna per stelling op een schaal van 1 (geheel mee oneens) tot en met 7 (geheel mee eens) aan in hoeverre je het eens bent met de stelling voor het product in de advertentie.

	Geheel mee oneens				Geheel mee eens			
Dit is een technisch ingewikkeld product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het ontwikkelen van een dergelijk product is technologisch zeer veeleisend.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Het product vereist kennis om het te installeren/gebruiken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Er is technische hulp mogelijk na aanschaf (bijvoorbeeld d.m.v. een handleiding)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Verstuur

Bedankt voor het invullen!

APPENDIX C: MEASURED CONSTRUCTS

<u>Attitude measures</u> Spears & Singh, 2004 Spears & Singh, 2004	Brand: Brand Attitude Bad ----- Good Unpleasant ----- Pleasant Unfavorable ----- Favorable Unappealing ----- Appealing Brand: Product Attitude Bad ----- Good Unpleasant ----- Pleasant Unattractive ----- Attractive
<u>Evaluations</u> Saxe & Weitz, 1982 Yoo, Donthu and Lee, 2000	Brand: Customer Orientation The brand Alcet.....has the customers' best interest in mindfigures out what customers needs arehelps customers to achieve their goalsfinds out what kind of product would be most helpful to a customeroffers a product that is best suited to the customers' needs Product: Product Quality the product in the advertisement is of high qualitythe likely quality of the product in the advertisement is extremely highthe likelihood that the product in the advertisement is reliable is very highthe product in the advertisement must be of very good qualitythe product in the advertisement appears to be of very poor quality
<u>Competitive advantage</u> Yoo & Donthu, 2001	Brand: Overall Brand Equity <ol style="list-style-type: none"> 1. It makes sense to buy Alcet instead of any other brand, even if they are the same. 2. Even if another brand has the same features as Alcet, I would prefer to buy Alcet. 3. If there is another brand as good as Alcet, I prefer to buy Alcet 4. If another brand is not different from Alcet in any way, it seems smarter to purchase Alcet.

Song & Parry, 1996	<p>Product:</p> <p>Product advantage</p> <ol style="list-style-type: none"> 1. Compared to competitive products, this product offers some unique features/ attributes to the costumers. 2. This product is clearly superior to competing products in terms of meeting customers'needs 3. This product is of higher quality than competing products.
<p><u>Behavioral intentions</u></p> <p>Bower and Landreth, 2001</p> <p>Maxham III, 2001</p> <p>Bower and Landreth, 2001</p> <p>Maxham III, 2001</p>	<p>Brand:</p> <p>Purchase intentions</p> <ol style="list-style-type: none"> 1. <i>I am eager to check out the brand because of this advertisement</i> 2. <i>I intend to try products of this brand</i> 3. <i>I plan on buying product of this brand</i> 4. <i>It is likely that I will buy product of this brand when it becomes available</i> 5. <i>I would consider buying products of this brand</i> <p>eWOM</p> <p>How likely are you to spread positive WOM about the brand Alcet?</p> <ol style="list-style-type: none"> 1. <i>I would recommend this brand to my friends and family</i> 2. <i>If my friends were looking for this kind of product, I would tell them to try the product of Alcet.</i> <p>Product:</p> <p>Purchase intentions</p> <ol style="list-style-type: none"> 1. <i>I am eager to check out the product because of this advertisement</i> 2. <i>I intend to try this product</i> 3. <i>I plan on buying this product</i> 4. <i>It is likely that I will buy this product when it becomes available</i> 5. <i>I would consider buying this product</i> <p>eWOM</p> <p>How likely are you to spread positive WOM about the product of Alcet.</p> <ol style="list-style-type: none"> 1. <i>I would recommend this product to my friends and family</i> 2. <i>If my friends were looking for this kind of product, I would tell them to try the product of Alcet.</i>
<p><u>Fit</u></p> <p>Simmons and Becker-Olsen, 2006 & Kamins & Gupta, 1994</p>	<p>Brand</p> <p><i>Do you think it is a good idea that Alcet collaborated on developing this software with the consumer?</i></p> <ol style="list-style-type: none"> 1. Suitable - - - - - Unsuitable 2. Makes sense - - - - - Does not make sense

	Product category <i>Do you think it is suitable to work together with consumers in order to develop new software?</i> 3. Suitable - - - - - Unsuitable 4. Makes sense - - - - - Does not make sense
<u>Involvement</u> Beatty and Talpade, 1994, Mittal & Lee, 1989 and Flynn, Goldsmith & Eastman, 1996	What is your general interest in software? 1. <i>In general I have strong interest in software.</i> 2. <i>Software is very relevant to me.</i>
<u>Novelty seeking</u> Manning, Bearding, Madden (1995).	1. <i>I often seek out information about new products and brands.</i> 2. <i>I frequently look for new products and services</i> 3. <i>I am continually seeking new product experiences</i> 4. <i>When I go shopping, I find myself spending very little time checking</i> 5. <i>out new products and brands</i>

APPENDIX D: MANIPULATIONS

Zero empowerment version
(Simple product)

Met trots presenteren wij onze nieuwe ijssmaak

Nieuw



Chocolate Chip Muffin

alcet™

f t

Select empowerment version
(Simple product)

Met trots presenteren wij onze nieuwe ijssmaak

Nieuw

Gekozen door consumenten



Chocolate Chip Muffin

alcet™

Het verhaal achter Chocolate Chip Muffin
Deze ijssmaak is gekozen door de consument. De productontwikkelaars van Alcet hebben door middel van hun ideeën en visies een aantal vernieuwende ijssmaken bedacht. Uit deze reeks smaken hebben de consumenten de lekkerste smaak gekozen, die uiteindelijk is opgenomen in het productassortiment van Alcet.

f t

Create empowerment version
(Simple product)

Met trots presenteren wij onze nieuwe ijssmaak

Nieuw

Bedacht door consumenten



Chocolate Chip Muffin

alcet™

Het verhaal achter Chocolate Chip Muffin
Deze ijssmaak is bedacht door de consument. Consumenten hebben door middel van hun ideeën en visies een aantal vernieuwende ijssmaken bedacht. Uit deze reeks smaken hebben de productontwikkelaars van Alcet de lekkerste smaak gekozen, die uiteindelijk is opgenomen in het productassortiment van Alcet.

f t

Full empowerment version
(Simple product)

Met trots presenteren wij onze nieuwe ijssmaak

Nieuw

Bedacht door consumenten & gekozen door consumenten



Chocolate Chip Muffin

alcet™

Het verhaal achter Chocolate Chip Muffin
Deze ijssmaak is bedacht & gekozen door de consument. Consumenten hebben door middel van hun ideeën en visies een aantal vernieuwende ijssmaken bedacht. Uit deze reeks smaken hebben de consumenten de lekkerste smaak gekozen, die uiteindelijk is opgenomen in het productassortiment van Alcet.

f t

Zero empowerment version
(Highly complex product)

Met trots presenteren wij onze nieuwe fotobewerkingssoftware

Nieuw



Alcet photofix 6.0

alcet™

f b

t w

Select empowerment version
(Highly complex product)

Met trots presenteren wij onze nieuwe fotobewerkingssoftware

Nieuw

Gekozen door consumenten



Alcet photofix 6.0

alcet™

Het verhaal achter Alcet photofix 6.0
Deze computersoftware is gekozen door de consument. De productontwikkelaars van Alcet hebben door middel van hun ideeën en visies een aantal vernieuwende softwaresystemen bedacht. Uit deze reeks ontwerpen hebben de consumenten de meest aantrekkelijke versie gekozen, die uiteindelijk is opgenomen in het productassortiment van Alcet.

f b

t w

Create empowerment version
(Highly complex product)

Met trots presenteren wij onze nieuwe fotobewerkingssoftware

Nieuw

Bedacht door consumenten



Alcet photofix 6.0

alcet™

Het verhaal achter Alcet photofix 6.0
Deze computersoftware is bedacht door de consument. Consumenten hebben door middel van hun ideeën en visies een aantal vernieuwende softwaresystemen bedacht. Uit deze reeks ontwerpen hebben de productontwikkelaars van Alcet de meest aantrekkelijke versie gekozen, die uiteindelijk is opgenomen in het productassortiment van Alcet.

f b

t w

Full empowerment version
(Highly complex product)

Met trots presenteren wij onze nieuwe fotobewerkingssoftware

Nieuw

Bedacht door consumenten & Gekozen door consumenten



Alcet photofix 6.0

alcet™

Het verhaal achter Alcet photofix 6.0
Deze computersoftware is bedacht & gekozen door de consument. Consumenten hebben door middel van hun ideeën en visies een aantal vernieuwende softwaresystemen bedacht. Uit deze reeks ontwerpen hebben de consumenten de meest aantrekkelijke versie gekozen, die uiteindelijk is opgenomen in het productassortiment van Alcet.

f b

t w

APPENDIX E: QUESTIONNAIRE (DUTCH)

Welkom

Beste respondent,

Bedankt dat u wilt deelnemen aan dit onderzoek dat wordt uitgevoerd namens de Universiteit Twente en dat onderdeel is van mijn master Communication Studies.

Dit is een onderzoek naar de lancering van een nieuw merk en product. Het invullen van de vragenlijst zal hooguit 10 minuten duren. Uw gegevens zullen anoniem verwerkt worden.

Indien u kans wilt maken op het winnen van een VVV bon t.w.v. €15,- kunt u aan einde van de vragenlijst uw e-mailadres achterlaten. (Alleen volledig ingevulde vragenlijsten maken kans).

Alvast heel erg bedankt voor uw deelname!

Nathalie van der Lof

Start van het onderzoek

Het onderzoek bestaat uit drie delen. Lees bij iedere vraag goed wat er van u gevraagd wordt. Er zijn geen goede of foute antwoorden, voor dit onderzoek ben ik geïnteresseerd in uw mening.

Het merk Alcet is een Nederlands merk dat verschillende ijssoorten ontwikkeld heeft. Binnenkort zal het merk een nieuwe ijsmaak introduceren in de winkels. Het merk Alcet is erg benieuwd naar je mening over het merk en het ijs.

Er volgt zometeen een advertentie van Alcet. Deze advertentie wordt gebruikt bij de lancering van de nieuwe ijsmaak. Neem deze advertentie goed in u op, het is namelijk niet mogelijk terug te keren naar de advertentie en/of vragen. Hierna volgen er enkele vragen met betrekking tot de getoonde advertentie.

Klik op de knop "verder" om de advertentie te bekijken.

MANIPULATIES => ADVERTENTIE

Blok1 a: Waardering Alcet

Onderstaande eigenschappen hebben betrekking op de advertentie van het merk 'Alcet' die zojuist getoond is.

Geef hieronder op de 7-puntsschaal aan welke eigenschappen u het meest toepasselijk vindt voor het merk Alcet op basis van de advertentie.

Alcet is een.....

Slecht merk _____ *Goed merk*

Onplezierig merk _____ *Plezierig merk*

Ongunstig merk _____ *Gunstig merk*

Onaantrekkelijk merk _____ *Aantrekkelijk merk*

Blok 1b: Waardering Alcet

Op basis van de indruk die u van de advertentie en Alcet heeft kunt u hieronder op een schaal van 1 tot en met 5 aangeven in hoeverre u het eens bent met de stellingen. Antwoordopties lopen van 1= helemaal mee oneens tot 5=helemaal mee eens.

Het merk "Alcet".....

-stelt de belangen van de klant voorop
-probeert erachter te komen wat de behoeften van de klanten zijn
-helpt de klant om zijn of haar doelen te bereiken.
-probeert niet uit te vinden welk product het nuttigst is voor de klant
-biedt een product dat het beste past bij de behoefte van de klant

Algemene stellingen

1. Ook als een ander merk dezelfde eigenschappen heeft als het merk Alcet, zou ik liever Alcet kopen.
 2. Het is niet zinvol om het merk Alcet te kopen in plaats van een ander merk, ook al is deze hetzelfde
 3. Als er een ander merk is dat net zo goed is als Alcet, zou ik liever Alcet kopen
 4. Als een ander merk niet verschillend is op enige wijze van het merk Alcet, lijkt het me slimmer om Alcet te kopen
-

Blok 1c: Koopgedrag

Onderstaande stellingen hebben ook betrekking op advertentie van Alcet. Geef op een schaal van 1 tot en met 5 aan in hoeverre u het eens bent met de volgende stellingen. Antwoordopties lopen weer van 1= helemaal mee oneens tot 5=helemaal mee eens.

1. Ik ben enthousiast om het merk Alcet te proberen door deze advertentie.
 2. Ik ben niet van plan ijs van Alcet te proberen
 3. Ik ben van plan ijs van Alcet te kopen
 4. Het is waarschijnlijk dat ik ijs van Alcet ga kopen wanneer het beschikbaar is.
 5. Ik zou niet overwegen ijs van Alcet aan te schaffen
 6. Ik zou Alcet aanbevelen aan mijn vrienden
 7. Als mijn vrienden naar soortgelijk ijs op zoek zijn, zou ik hen vertellen om het ijs van Alcet te proberen.
-

Blok 1d: Samenwerking

(Alleen bij de co creatie versies)

Alcet is benieuwd of het een goed idee is om bij de ontwikkeling van ijs samen te werken met consumenten. Geef op de 7-puntschaal hieronder aan welke eigenschap u het meest van toepassing vindt:

De samenwerking tussen Alcet en consumenten bij de ontwikkeling van ijs is een.....

Ongeschikte samenwerking _____ Geschikte samenwerking

Onlogische samenwerking _____ Logische samenwerking

Alvorens de vragen van het tweede blok aan bod komen zal eerst nog een keer de advertentie van het merk Alcet getoond worden. Hierna zullen enkele vragen getoond worden met betrekking tot het product in de advertentie.

Klik op de knop "verder" om de advertentie nogmaals te bekijken

ADVERTENTIE:

Blok 2a: Waardering ijs

Onderstaande eigenschappen hebben betrekking op het getoonde ijs in de advertentie.

Geef hieronder op de 7-puntschaal aan welke eigenschappen u het meest toepasselijk vindt voor het ijs op basis van de advertentie die u zojuist gezien hebt.

Slecht ijs _____ Goed ijs

Onplezierig ijs _____ Plezierig ijs

Onaantrekkelijk ijs _____ Aantrekkelijk ijs

Blok 2b: Waardering ijs

Op basis van de indruk die u van de advertentie en het ijs heeft kunt u hieronder op een schaal van 1 tot en met 5 aangeven in hoeverre u het eens bent met de stellingen. Antwoordopties lopen van 1= helemaal mee oneens tot 5=helemaal mee eens.

1. *In vergelijking met concurrerend ijs biedt dit ijs enkele unieke kenmerken/eigenschappen aan de klanten.*
2. *Dit ijs is duidelijk beter dan concurrerend ijs in het naleven van de behoeften van de klanten*
3. *Dit ijs is van lagere kwaliteit dan dat van concurrerende producten..*

Op basis van de advertentie denk ik.....

- dat het ijs in de advertentie van hoge kwaliteit is.
 - dat de waarschijnlijke kwaliteit van het ijs hoog is.
 - dat het ijs in de advertentie van lage kwaliteit is.
 - dat de betrouwbaarheid van het ijs waarschijnlijk hoog is.
 -dat het ijs in de advertentie van hele goede kwaliteit zal zijn.
-

Blok 2c: Koopgedrag

Onderstaande stellingen hebben ook betrekking op de advertentie voor het ijs. Geef ook hierbij op een schaal van 1 tot en met 5 aan in hoeverre u het eens bent met de volgende stellingen.

Antwoordopties lopen weer van 1= helemaal mee oneens tot 5=helemaal mee eens.

1. *Ik ben enthousiast om het ijs te proberen door deze advertentie.*
2. *Ik ben van plan dit ijs te proberen*
3. *Ik ben van plan om dit ijs te kopen*
4. *Het is waarschijnlijk dat ik dit ijs ga kopen wanneer het beschikbaar is.*
5. *Ik zou overwegen dit ijs aan te schaffen.*
6. *Ik zou dit ijs aanbevelen aan mijn vrienden*
7. *Als mijn vrienden naar ijs op zoek zijn zou ik hen vertellen om dit ijs te proberen.*

Blok 2d: Samenwerking

(Alleen bij de co creatie versies)

Geef hieronder op de 7-puntschaal aan welke eigenschappen u het meest toepasselijk vindt bij de volgende stelling.

Denkt u dat het geschikt is om samen te werken met consumenten om een nieuwe ijssmaak te ontwikkelen?

1. *Geschikte samenwerking*_____ *Ongeschikte samenwerking*
2. *Logische samenwerking*_____ *Onlogische samenwerking*

Je bent aangekomen bij het laatste deel van deze vragenlijst, waarin er gevraagd wordt naar enkele achtergrond variabelen.

Blok 3: Achtergrond informatie

Wat is uw algemene interesse in ijs? Geef hierbij op een schaal van 1 tot en met 5 aan in hoeverre u het eens bent met de volgende stellingen. Antwoordopties lopen van 1= helemaal mee oneens tot 5=helemaal mee eens.

Volgende stellingen hebben betrekking op uw interesse in nieuwe producten in het algemeen. Geef hierbij op een schaal van 1 tot en met 5 aan in hoeverre u het eens bent met de volgende stellingen. Antwoordopties lopen van 1= helemaal mee oneens tot 5=helemaal mee eens.

1. *Ik ga vaak op zoek naar informatie over nieuwe producten en merken*
2. *Ik ben vaak op zoek naar nieuwe producten en diensten*
3. *Ik ben voortdurend op zoek naar nieuwe productervaringen.*
4. *Als ik ga winkelen, merk ik dat ik weinig tijd besteed aan het checken van nieuwe producten en merken.*

Wat is uw geslacht?

- *Man*
- *Vrouw*

Wat is uw leeftijd in jaren?

..... jaar

Wat is je hoogst genoten opleiding?

- *Basisonderwijs / Lager Onderwijs*
- *LBO*
- *VMBO / MAVO / MULO*
- *HAVO*
- *VWO/ Gymnasium / Atheneum / HBS*
- *MBO*
- *HBO / post-HBO*
- *WO / Universiteit*

6. Wil je kans maken op de VVV bon t.w.v. €15,00? Vul dan je e-mail adres hieronder in

Vergeet niet op de knop versturen te klikken om de vragenlijst te verzenden.

Hartelijk dank voor je medewerking!

APPENDIX E: ADDITIONAL MEASUREMENTS

Correlation of depended variables

A correlation analysis was conducted to test whether the different depended variables of this research significant correlate with each other. Outcomes of this test are summarized in table 15.

Table 15: correlation between the depended variables

Variables	1	2	3	4	5	6	7	8	9	10
1. Product attitude	1									
2. Product quality	.59	1								
3. Product advantage	.47	.56	1							
4. Brand attitude	.59	.50	.36	1						
5. Customer orientation	.36	.34	.52	.31	1					
6. Overall brand equity	.35	.44	.46	.39	.36	1				
7. Product buy intentions	.50	.49	.36	.37	.32	.40	1			
8. Product positive WOM	.56	.58	.51	.40	.37	.50	.60	1		
9. Brand buy intention	.50	.54	.40	.49	.33	.52	.69	.61	1	
10. Brand positive WOM	.60	.59	.49	.45	.38	.54	.60	.84	.66	1

The correlation analysis shows that all dependent variables correlate significant with each other (all in a positive direction). Especially attitudes and behavioural intentions correlate with each other, which indicate that those variables are very depended of each other. Higher levels of product attitude for example do lead to more positive behavioural intentions. The fact that these variables correlate with each other may have an impact on the overall results.