Consumers' Purchase Perception of Co-Created Products.

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Management Summary

An increasing number of companies is adopting co-creation activities into their day-to-day business. Academic literature has, so far, paid attention to co-creation by studying the impact for firms and their employees, and the participants of co-creation. Limited attention is given to the effects of co-creation purchases on non-participants of these activities. The aim of this paper has been, to identify the differences between the purchase of standard, designer-driven, and co-created, user-driven, products. First, a literature review has clarified the reasons for the increase in co-creation activities, where the shift from a goods-dominant market to a services-dominant market, due to empowerment of consumers is discussed. The Consumer Decision Making process is evaluated, leading to the factors that influence the adoption of products; recommendation by peers, trust, need perception and risk. The 5 risk factors, performance risk, social risk, time risk, psychological risk and financial risk, are evaluated to form expected influences in the purchase of a co-created product.

Based on the literature review a survey is conducted, using preexistent multi-item scales, to examine the differences between standard and co-created products in terms of purchase likelihood, overall risk, financial risk, quality perception, willingness to pay, trust in word-of-mouth recommendations and brand recognition. For this, 2 products are selected, namely chips, low involvement product, and laptops, high involvement product, where chips was represented by the brand Lay's and laptops were studied using Dell. Both products had a non-existent variant, Crisp and Chip, to identify the effect of branding. The data of the quantitative research are analyzed by use of either Two-way ANOVA, MANOVA, independent samples t-test and paired samples t-tests, based on the appropriateness.

The results indicate that no differences in consumer perception exist, with exception of the trust in word-of-mouth recommendations by peers, where endorsements by co-creators are considered less trustworthy, since they themselves participated in the co-creation process. Based on the results of the literature review and the survey evaluation, companies are advised to invest in co-creation, especially when the products is of low involvement, price the co-created products the same as one would do standard products, and not rely on peer recommendations solely, but keep investing in the marketing of the co-created products.

Table of Content

Preface

After a period at Erasmus University where I got the chance to deepen my knowledge of marketing and gain more insight, I have found my interest in the shift of the bargaining power of companies towards that of consumers. My specific interest in co-creation was triggered by the seminar Consumer Channel Dynamics in which the mechanisms of consumer participation within business were enlightened. The importance of a thorough understanding in this field was clear to me after participation in multiple marketing events hosted by companies, among which the Amsterdam Marketing Event at the IBM headquarters in 2012, where guest speakers shared their crowdsourcing vision and their learnings, gained through trial and error. This thesis has been my attempt to scientifically contribute to a new trend in business. Although writing a master thesis is an individually assignment, there are many people that have helped me through this process. First of all, my gratitude goes out to my supervisor Dr. Feray Adiguzel. Her passion and drive to guide me towards excellence have been amazing. With her help I found a way to put the pieces of the puzzle, the courses, and create a bigger picture.

Writing this thesis, for me, has been an emotional rollercoaster, with many highlights and disappointments, academically as well personally. My constant factor here has been my mother, who taught me to never give up and to always continue fighting.

Furthermore, among the many, my appreciation goes out to the respondents of my survey, who took the time to contribute to my studies.

Even though there is much research that needs to be done in order to grasp the effects of crowdsourcing, and the shift towards consumer empowerment, I am pleased with the results of this study. I am hopeful that this thesis will contribute to the scientific field of co-creation.

In loving memory of my aunt, Zary Atashzai. I hope you are proud of me.

Mahrou Kharazi
Rotterdam, July 2014

Introduction

> *"Goodbye and good luck, Mr. Kotler.*
>
> *Goodbyes are never easy. They're particularly hard when you have to bid your adieus to people whom you like and respect, and to stars that have as much meaning and influence as Mister Kotler.*
>
> *However, regardless of how hard it is, dear Kotlerians, it is time for us to say goodbye. Your reign is over.*
>
> *We, the marketers, are leaving the 'Kotlerian sector!' "*
>
> *Christian Blümelhuber, 2007; 36.*

Since the industrial revolution many changes and new discoveries related to business have taken place, forcing marketing to change and adapt to circumstances. These changes in behavior have led to different company focuses. Lancaster and Reynolds (2005) describe several concepts in which the changing relationship between consumer and supplier has been explained. The introduction of the Web 2.0, has yet again changed the relationship between consumers and organizations (Hammon and Hippner, 2012; Füller et al. 2010; Berthon et al., 2012). With the increasing availability of internet connections and the rise of social media, consumers now have a louder voice than ever, leading to both threats to companies and opportunities for new business concepts (Füller et al. 2010). Due to these changes, as Blümelhuber (2007) points out, the traditional view of marketing as Kotler has described in many marketing scholar textbooks, does not represent the real world of marketing any more.

One of the most debated concepts that is introduced in recent years is 'value co-creation'. Vargo and Lusch (2004) have introduced this terminology, which explains how consumers and organizations together create value. This conflicts the traditional idea of value creation trough the supply chain of companies described by Porter (1985). Due to the Web 2.0 and social media platforms, customers now are considered *"informed, connected, empowered and active consumers"*, (Pralahad and Ramaswang 2004, p6).

Companies that make use of these empowered consumers by correctly incorporating co-creation activities can have a competitive advantage (Nambisan and Nambisan, 2008). Therefore, an increasing number of traditionally operating companies is adopting co-creation

activities in their day-to-day business (e.g., Hammon and Hippner, 2012; Füller et al. 2010), among which Microsoft, Cisco, Nokia, Volvo and Nike (Nambisan and Nambisan, 2008). However, numerous companies are set up, purely based on the idea of co-creation. Threadless.com, iStockphoto.com and InnoCentive.com are just a few examples of extremely successful co-creation initiatives based up on open-innovation and crowdsourcing in particular (Brabham 2010). When the co-creation process has led to a final innovation, the produced commodities are offered to the broad consumer market.

As consumers are increasingly empowered and contributing to co-creation, more and more crowdsourced products are reaching the marketplace. Crowdsourcing is a type of co-creation, where firms outsource part of the product development to a group of consumers, usually trough platforms on the internet (Zhen et al, 2011). Hammon and Hippner (2012) define crowdsourcing as;

"The act of outsourcing tasks originally performed inside an organization, or assigned externally in form of a business relationship, to an indefinably large, heterogeneous mass of potential actors. This happens by means of an open call via the Internet for the purpose of free, value creative use. The incentive to participate can be monetary and/or non-monetary in nature", (Hammon and Hippner, 2012 p.163).

Due to co-creation the firm-consumer relation has changed dramatically (Voß et al., 2008). Participants of crowdsourcing activities do not reflect the consumer market as a whole. Simultaneously, the co-creator might be, but does not necessarily need to be, a customer of the co-created end-product (Djelassi and Decoopman, 2013). For this reason, in the remaining of this paper the co-creator, or crowdsourcee (Nambisan and Nambisan, 2008), and customer (or consumer) are considered as different actors.

Current research on crowdsourcing neglects to take into account the entire group of consumers. However, as they are the customers purchasing the product it is important to understand how crowdsourcing affects the consumer group as a whole.
Crowdsourced products go through a different supply chain and value chain as compared to standard products (Vargo and Lusch, 2004, Abraham, 2005). Implementation of crowdsourcing might bring risk to the company (Nambisan and Nambisan, 2008), uncertainty and fear for the traditional roles of employees (Saarijärvi et al., 2013), and hesitation to co-

creators (Djelassi and Decoopman, 2013). But, crowdsourcing might bring risks to the consumer as well.

Perceived risk, represents *"Consumers uncertainty about the potential positive and negative consequences of the purchase decision",* (Blackwell, Miniard, Engel 2006). Siegrist et al. (2008) state that benefits associated with a good are more easily perceived when the product comes from a trusted source. Where traditionally innovations were generated by trusted brands, an indefinably large, heterogeneous mass of unknown actors is responsible for the produce of crowdsourced items (Hammon and Hippner, 2012).

This research will bring light to crowdsourcing from the consumer point of view. It will provide a better insight in the perception of these consumers, by comparing the risk associated with the purchase of a crowdsourced product to the perceived risk of buying a standard product.

The changing value creation model and the incorporation of crowdsourcing activities by firms, change the traditional landscape in which consumers make a purchase decision. These changes lead to the main question of this paper;

As compared to the purchase of standard products, how are crowdsourcing initiatives influencing the purchase behavior of consumers who do not participate in open-innovation activities?

The following sub questions will help answering the research question;
1. How does crowdsourcing (i.e. user-driven firms) change the different roles and relations of participants; consumers, co-creator and firm?

2. How do crowdsourced (i.e. user-driven firms) products change the consumer decision making process as compared to standard products (i.e. designer-driven-firms)?

3. What is the role of perceived risk in the purchase decision of a crowdsourced product (i.e. user-driven firms) as compared to a standard product (i.e. designer-driven firms) in terms of consumer evaluation?

4. How do product involvement and product category influence the assessment of a crowdsourced product (i.e. user-driven firm)?

5. What is the importance of a known brand in the co-creation process (i.e. user-driven firm)?

Scientific Relevance

As co-creation, crowdsourcing and open-innovation within academic writing are relatively new phenomena there is still much research that must be done to get a better insight (e.g. Leimeister 2010, Vargo and Lusch, 2008, Howe,2009). Current studies have focused extensively on the benefits from a firm-point-of-view (e.g. Leimeister ,2010; Hammon and Hippner,2012; Vargo and Lusch,2004) and from a consumer-point-of-view (eg. Djelassi and Decoopman, 2013; Brabham, 2010), where the participants of co-creation are considered to be the consumers.

Studies emphasizing the firm-point-of-view describe the benefits for adopting co-creation activities (Porter, 2008) and potential strategies to boost the motivation of consumers as co-creators (Zheng et al., 2011; Ebner et al. 2009). Research on the consumer-point-of-view is mainly focused on the risks of consumers that take part in crowdsourcing and open-innovation initiatives, such as the risk of exploitation (Djelassi and Decoopman,2013), and the perceived benefits and underlying motives, as an effect of participating in co-production, like the feeling of empowerment (Füller et al, 2010).

However, the implications of crowdsourcing for the consumer market as a whole is, to our best knowledge, not further explored within the academic context. Voß et al. (2008) explain that the prosumers are the ones participating in crowdsourcing, while the consumer group as a whole, has no choice but to accept the changing organizational, decision-making and innovative setup. Nevertheless, corporate outsourcing does change the firm-consumer relation (Voß et al.,2008).

One could expect that this changing relation will have an impact on consumers who do not participate in the co-creation of commodities, in turns of the Consumer Decision Making Process model (CDP model) of Blackwell et al. (2001).

Kottler and Keller (2012) shed light on the perceived risk in product adoption, which heavily influences the Consumer Decision Process. The uncertainty that consumers face about the

potential consequences, both positive and negative, of their purchase decision, are referred to as 'perceived risk' (Blackwell et all., 2001). Increased perceived risk in product adoption will lead to a modified, avoided or postponed purchase decision (Kotler and Keller, 2012). This research will contribute to a more complete reflection of the implications and opportunities of crowdsourcing activities in the form of open-innovation, as it will incorporate a very important and large group of actors, namely the consumers purchasing the crowdsourced products. The scientific contribution of this research can be seen in figure 1.

Research	Focus	Method	Objective
Bedapudi and Leone (2003)	Psychological implications of co-creation	Qualitative Research (ethnographic)	Consumer-point-of-view (co-creator)
Vargo and Lusch (2004)	Co-creation of value versus standard value chain.	Qualitative Research (ethnographic)	Firm-point-of-view
Pralahad and Ramaswang (2004)	Relationships in value creation between firm and co-creator	Qualitative Research (ethnographic)	Consumer-point-of-view (co-creator) and firm-point-of-view
Voß and Rieder (2005)	Working consumer as co-worker in the organization	Qualitative Research (ethnographic)	Firm-point-of-view
Etgar et al. (2008)	Customer engagement in co-creation	Qualitative Research (in-depth interviews)	Consumer-point-of-view (co-creator)
Nambisan and Nambisan (2008)	Motivations for participation in open-innovation	Qualitative Research (in-depth interviews) and Quantitative (survey)	Consumer-point-of-view (co-creator)
Leimeister (2010)	Successful use of collective intelligence in business environment	Qualitative Research (ethnographic)	Firm-point-of-view
Brabham (2010)	Motivation of crowdsourcing at Threadless.com	Ethnographic Research	Consumer-point-of-view (co-creator)
Mühlbacher et al. (2010)	Consumer empowerment trough crowdsourcing	Quantitative (survey)	Consumer-point-of-view (co-creator)
Zheng et al. (2011)	Intrinsic motivation of participation in crowdsourcing	Quantitative (survey) and Secondary Data	Consumer-point-of-view (co-creator)
Hammon and Hippner (2012)	Crowdsourcing within innovation categories	Ethnographic Research	Firm-point-of-view
Saarijärvi et al. (2013)	Business oriented analytical framework of value co-creation	Qualitative Research (ethnographic)	Firm-point-of-view
Djelassi and Decoopman (2013)	Implications of participation in open-innovation	Qualitative Research (in-depth interviews) and Secondary Data	Consumer-point-of-view (co-creator) & firm-point-of-view
Current study (Kharazi, 2013)	Comparison of consumer evaluation of crowdsourced versus standard products	Quantitative Research (survey)	Consumer-point-of-view (consumer market as a whole)

Figure 1. Overview of relevant previous studies on co-creation and crowdsourcing.

Managerial Relevance

The main objective of every organization, commercial as well as non-profit, is to create value (Vargo and Lusch, 2004). In the process of value creation consumers play an increasingly important role, due to the empowerment of this segment (Füller et al, 2010). As the number of crowdsourcing initiatives, as a way to co-create with consumers and create a deeper bound, is growing, it is of great importance for managers to understand the logic of this business in order to remain competitive (Saarijärvi et al., 2013). Many companies introduce crowdsourcing, without having a precise vision of expectations (Schweitzer et al., 2012).Schweitzer et al. (2012) point that a cost-benefit analysis is key in deciding whether to crowdsource a project or use the traditional activities, such as focus groups. A precise cost-benefit analysis and correct decision making, can only take place when all of the actors involved in the crowdsourcing process are analyzed.

Knowing how consumers who do not participate in crowdsourcing initiatives will perceive the user-driven innovation is essential for organizations. Value is created by each party associated with the end-product (Pralahad and Ramaswang, 2004). The end-consumer is a segment of scale which should be emphasized, as they are perhaps the most important stakeholder. By understanding the perceived risk related to the purchase of a crowdsourced product, managers can decide not to participate in crowdsourcing, or perhaps take initial steps to reduce any possible risks. Successful crowdsourcing initiatives within open-innovation can only be considered so, when the total value that is co-created exceeds the value of standard production (Schweitzer et al., 2012). Having a complete image of the ecosystem of crowdsourcing and the possible implications for stakeholders is essential when drafting an innovation strategy and simultaneously seeking competiveness (Saarijärvi et al., 2013).

This study will contribute to a more complete representation of crowdsourcing and the possible implications, offering managers a better insight and providing suggestions of areas that need more attention, in order to effectively implement crowdsourcing as an innovation tool. By these means, this study will help managers to decide if they want to crowdsource any innovation, what categories of innovations to outsource to the crowd and, how to offset any possible perceived risk associated to the purchase of crowdsourced products.

Literature Review

In this section, through a theoretical approach, value co-creation, crowdsourcing, the consumer purchase decision and perceived risk associated to the purchase decision will be elaborated on. This review will lead to the creation of hypotheses that will be tested in the experimental research section of this paper.

The Value Co-Creation Concept

The concept of value co-creation introduced by Vargo and Lusch (2004) finds it roots in relationship marketing. "Relationship marketing is the process of identifying, developing, maintaining, and terminating relational exchanges with the purpose of enhancing performance" (Palmatier 2008, p. 5). Relationship Marketing finds its roots in the B2B marketing and service marketing (Ballantyne et al. 2003;Gronroos 2000). By intensifying interactions and trough networking, the lifetime value of relationships was opt to be of higher importance. Vargo and Lusch (2004) believe that service marketing is much broader than it was originally considered in, what they call; 'the Goods-Dominant logic (G-D logic)'. Where service is perceived as an intangible good in the G-D logic, the Service-Dominant logic (S-D logic) implies that the fundamental purpose of economic exchange lies within the transaction of benefits. Within the S-D logic, goods are perceived as transmitters of service, with which consumers can benefit from the competences of the firms (Saarijärvi et al, 2013). Consumers do not purchase means, but rather search for solutions, or desired states (Vargo and Lusch, 2004). As all commodities, from an S-D logic, are considered service transmitters, co-creation of value appears in every single sale that takes place. But more importantly, it is the use of a product, the desired state that resembles the co-created value (Vargo and Lusch, 2008). Co-creation of value from an S-D logic is a very broad term. More specifically co-creation can take place in the form of co-production, where consumers play a more proactive role (Vargo and Lusch, 2010).

Consumer Empowerment

Traditionally firms were seen as autonomously acting organizations, responsible for the design, production, marketing communication and management of sales channels. Interaction with consumers only took place at the exchange point, or purchase (Pralahad and Ramaswamy, 2004). Due to dissatisfaction of available choice of products and upcoming

availability of tools, such as internet, consumers nowadays feel the need to interact with firms. These new consumers are; "..connected, informed, empowered and active ",(Pralahad and Ramaswamy, 2004, p.6).

Many research papers, among which Füller et al. (2010), assign the increase of online communities, introduction of Web 2.0, and the decreasing costs of internet usage as the reason for consumer empowerment (Füller et al.2010). Figure 2 shows a worldwide internet usage increase of 566% between the year 2000 and 2012 (Internet World Stats, 2012).

WORLD INTERNET USAGE AND POPULATION STATISTICS June 30, 2012						
World Regions	Population (2012 Est.)	Internet Users Dec. 31, 2000	Internet Users Latest Data	Penetration (% Population)	Growth 2000-2012	Users % of Table
Africa	1,073,380,925	4,514,400	167,335,676	15.6 %	3,606.7 %	7.0 %
Asia	3,922,066,987	114,304,000	1,076,681,059	27.5 %	841.9 %	44.8 %
Europe	820,918,446	105,096,093	518,512,109	63.2 %	393.4 %	21.5 %
Middle East	223,608,203	3,284,800	90,000,455	40.2 %	2,639.9 %	3.7 %
North America	348,280,154	108,096,800	273,785,413	78.6 %	153.3 %	11.4 %
Latin America / Caribbean	593,688,638	18,068,919	254,915,745	42.9 %	1,310.8 %	10.6 %
Oceania / Australia	35,903,569	7,620,480	24,287,919	67.6 %	218.7 %	1.0 %
WORLD TOTAL	7,017,846,922	360,985,492	2,405,518,376	34.3 %	566.4 %	100.0 %

Figure 2. World Internet Usage and Population Statistics (Internet World Stats, 2012)

This increase in the number of internet connections and the time spent on the internet is one of the main reasons why social media platforms could become as popular as they are today (Kaplan and Haenlein, 2010).

Kaplan and Haenlein (2010, p.60) define social media as *"A group of internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content."*

According to the data of the Nielsen Company (2012) people spend most of their time on social media websites, as compared to any other website. Which increases Word-of-mouth behavior, enabling influence on other consumers (Brown and Reingen, 1987), further empowers consumers, trough collective power, and extends the possibilities for co-creation of value (Leimeister et al.2010).

12

Internet based social networking can be combined with online marketing strategies, such as co-design (Son et al. 2012), referred to as 'virtual customer integration' (Füller et al.2010). Virtual customer integration, or customer participation in production (Hunt et al., 2012) can take place either through existing social networking channels, for example Facebook, trough firm-hosted community platforms, or by making use of third-party providers of platforms, such as InnoCentive, an online marketplace hosting open-innovation contests (Zhen et al. 2011).

Co-Creation Process

Leimeister (2010) explains co-creation by evaluating the building blocks of collective intelligence. He argues that collective intelligence will lead to higher performance, since group outcome will always provide a better solution when compared to a specialized team, for example the R&D department. Important in analyzing the created value of the crowd, which individually are called actors, is to distinguish between;

1. What is accomplished?
2. Who performs the task?

The accomplishment can either take place through the 'create gene', where the actors are creating, for example open innovation, or the 'decide gene' where actors vote on an outcome individually, or evaluate a given outcome in the form of a 'group decision'.

The performance of the task can take place at a higher position, within the firm, hierarchy gene, or can be accomplished by the 'crowd', which consists of many individuals/actors that voluntarily perform a task without being assigned to it. (Leimeister, 2010).

Except for the hierarchy gene, the distinctions that Leimeister (2010) makes are all based on crowdsourcing, as crowdsourcing is a very broad term used to describe the outsourcing of corporate tasks to the crowd (Howe, 2009). Some examples of crowdsourcing activities not related to the innovation process are; prediction markets, crowdfunding and crowdrecruiting (Hammon and Hippner, 2012). As this paper examines the purchase behavior of newly launched products on the market, the focus will be on crowdsourcing within the open-innovation setting.

Open-innovation is the process whereby companies outsource their idea generation for innovation, technology and capabilities in product development to an external group of voluntarily participating actors (Chesbrough, 2003).

Internet based open-innovation platforms offer co-creators a place on the internet where they can share their ideas on product development. These platforms can be open for anyone who is interested to participate, or consist of an exclusively invited group of participants, where selection is based on expertise. The choice whether to offer a completely open platform or a closed platform is dependent on the aim of idea generation. When the variety of ideas is most important, open platforms are used, as they generate more diverse and a higher quantity of thoughts, whereas a closed group of experts leads to more functional outcomes (Zhen et al., 2012).

The idea feedback and selection can take place either by experts assigned to by the company, hierarchy gene, or by the 'crowd' (Leimeister, 2010). Obviously the roles that consumers can take within co-creation are very diverse. Nambisan and Nambisan (2008) divide the potential roles in five categories relevant to the innovation process; Product conceptualizer, product designer, product tester, product support specialist, and product marketer.

Motivation of Participation in Co-creation

Etgar et al. (2008) explain that customer participation is the degree to which customers are involved in production and delivery of service, distinguishing three levels of production, namely; firm production, joint production and customer production. The new empowered consumers, actively participating in co-creation activities are considered "prosumers", individuals consuming that what they produce, (Humphreys & Grayson, 2008), or "working consumers", (Voß and Rieder, 2005).

Brabham (2010) examined the consumer motivations for participating in the crowdsourcing initiative of Threadless, an online t-shirt selling company, whose business model is based purely on open-innovation. Several motivational aspects for contribution where identified; The opportunity of earning money, the opportunity of improving creative skills, the forthcoming of career opportunities, and the love for the community. Leimeister (2010) distinguishes; Learning, direct compensation, self-marketing, and social motives. Where

Füller et al. (2010) differentiate; Direct compensation, curiosity, personal needs and interests. Zheng et al. (2011) separate the intrinsic and extrinsic variables. Extrinsic include recognition and the possibility for monetary returns, where intrinsic motives incorporate autonomy, variety seeking behavior and tacit knowledge (Zheng et al.,2011) All of the research papers mentioned, emphasize the dominant effect of intrinsic value, recognition and the feeling of 'belonging to a community', as compared to the monetary compensation, which proves to be of lesser importance. From the motives of participation in crowdsourcing initiatives, one can conclude that the shift towards value co-creation for consumers is more of an intrinsic matter, rather than a financial purpose.

Relational Differences Between Traditional and Co-Creation Structure

The new value creating ecosystem has led to changes in the roles of the actors and the traditional relationships among them (Füller et al.2010). This leads to the first sub question; *How does crowdsourcing (i.e. user-driven firms) change the different roles and relations of participants; consumers, co-creator and firm?*

Figure 3 is a simplified model representing the traditional versus the co-created ecosystem. Three actors are distinguished in this figure, namely; the organization (both commercial as well as non-profit), the consumers and the co-creators. As can be seen in this simplified model, the consumer segment is larger than the organization, since the assumption is made that there are relatively more consumers necessary in order for the organization to remain competitive.
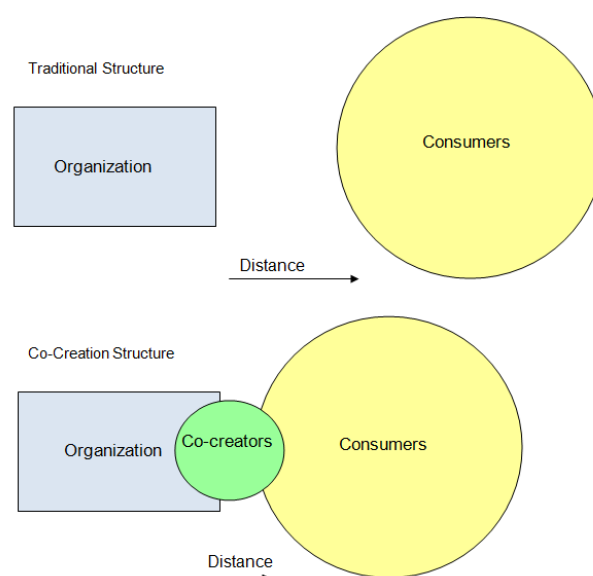

Figure 3. Traditional structure versus co-creation structure. Kharazi 2014

15

In the traditional system the distance between the organization and the consumers is larger as compared to the co-created structure. Reason for this is the empowerment of the consumers due to availability of the internet, social media and the changing attitudes of consumers, leading to more active consumers, who are fulfilling their need of interaction with organizations (Füller et al.2010).

In the co-creation structure a third actor, the co-creators, is incorporated. Although co-creation activities are increasingly implemented by organizations (Hammon and Hippner, 2012), the relative number of participants in open-innovation activities as compared to the consumer segment as a whole, is much smaller. As mentioned previously, the co-creator might be, but does not necessarily need to be, a customer of the co-created end-product (Djelassi and Decoopman, 2013). For this reason only part of the co-creators segment falls within the consumers segment. Which is the group described by Humphreys & Grayson (2008) as the 'prosumers' and by Voß and Rieder (2005) as the 'working consumers'.

As explained by Leimeister (2010) one can distinguish between the decide gene and the create gene. The decide gene resembles crowdsourcing, contributing to the value, but not actually producing with the organization. However, the create gene contributes to the real production of the commodity, as is the case in open-innovation. For this reason part of the co-creators segment falls within the firm segment. This in in line with the relational description between organization and co-creator of Etgar (2008), where participants of co-production are referred to as "partial employees".

Furthermore, figure 3 shows that the gap between the organization and the consumers is filled up by the co-creators. Brabham (2010), Zheng et al. (2011), Leimeister (2010) and Füller et al (2010), all emphasize the intrinsic motivation of participating in co-creation initiatives. The main reason for participation in co-creation is personal interest. As co-creators are part of the empowered consumer segment using Web 2.0 and social media, one can conclude that the role of 'product marketer' mentioned by Nambisan and Nambisan influences other consumers. Combining the category 'product support specialist' and 'product marketer' leads to a smaller gap between the organization and the consumers segment.

The influence of co-creators on consumers is relatively more effective than any type of firm-driven communication. Reason for this lies in the research of Siegrist et al. (2008) which found that benefits associated with a good are more easily perceived when the information

comes from a trusted source. The effect of advice is much stronger when advice comes from friends and family (62%), as compared to the strength of the effect of advice provided by sellers (46%) (Simcock et al. 2006).

If crowdsourced products encounter the same effect, the research of Siegrist et al. (2008) and Simcock et al. (2006) would hold for crowdsourced products as well. However, since co-creators are considered 'partial employees' (Etgar, 2008), this might disrupt trust and lead to a feeling of subjectivity towards the co-creator.

From this, the first hypothesis can be drawn up;

H1; Consumers have more trust in advice and recommendations when these concern designer-driven products, than they have in advice and recommendations, provided by co-creators, concerning user-driven products

One would expect that this hypothesis will hold, since crowdsourced products are the result of cooperation between prosumers and companies. The co-creators might be considered subjective by the consumers. Nevertheless, the prosumer is still a trusted source. Testing this hypothesis will lead to a better understanding of trust, between co-creator and consumer, in the co-creation ecosystem where the roles of the actors are different. The role of trustees will be further elaborated on from another point of view, in the creation of hypothesis 3, where risk assessment in purchase decisions will be discussed.

Changing Roles due to Co-Creation

Based on the model of figure 3, so far, the changing relations between the actors in traditional versus the co-creation atmosphere are explained. However, co-creation changes the roles of the actors as well.

Organizations

Where organizations were traditionally responsible for the supply of products, co-creation changes the locus of attention (Saarijärvi et al., 2013). Saarijärvi et al. (2013) explain that, the first step for organizations is to acknowledge that products are not 'finished objects', but rather the 'processes of co-creation'. In order to strengthen the relationships with consumers they need to create interaction points. Organizations are responsible for the establishment of

co-creation mechanisms, and implementation of incentives and other motivational tools in order to increase customer involvement in co-production. Furthermore, Saarijärvi et al. (2013) stress that the knowledge and competences of co-creators influence the quality of the outcome of co-creation. For this reason it is important to inform customers and provide them ways to gain knowledge. Nambisan and Nambisan (2008) add to this the increasing magnitude of transparency, as compared to the traditional operations.

Consumers

Crowdsourcing, in the form of co-creation, does change the role of the consumer radically as well. Instead of searching for the right product among the available alternatives, consumers now have to be more proactive and involved in order to maximize their utility. This increases the significance of communication with the providers. As Vargo and Lusch (2004, p.11) make clear, "customers need to use, maintain, repair and adapt the appliance to their unique needs."

Co-Creators

Since co-creators, in the traditional designer-driven firms, were part of the consumer group, their occupation as prosumer did not yet exist. As working consumer they have several roles as explained by Nambisan and Nambisan (2008). Besides these main tasks, perhaps their most important role, with respect to the consumer market, is being responsible for the communication campaign of the organizations. As crowdsourcing leads to communication of the initiative, on for example the Web, and the firm responsible for the crowdsourcing initiative (Djelassi and Decoopman, 2013).

One can conclude with a short summary of the answer to the sub question; *How does crowdsourcing (i.e. user-driven firms) change the different roles and relations of participants; consumers, co-creator and firm?*

Within the user-driven mechanism, firms have to improve communication with both consumers and co-creators, provide; transparency, information, knowledge, and tools. Furthermore, internal hierarchy and idea generation processes are now led differently. Consumers have better opportunities to fulfill their needs. In order to do so, they must be proactive, and aware of their needs. The new actors, co-creators, are responsible for the;

product conceptualization, product design, product testing, product support specialization, and product marketing. Furthermore, they communicate the initiative and the company to other consumers. In order to have a valuable contribution, gaining knowledge is essential.

The Consumer Decision Making Process

In order to analyze the differences in purchase between designer-driven products and user-driven products, the Consumer Decision Making Process model (CDP model) of Blackwell, Miniard and Engel (2001) will be used.
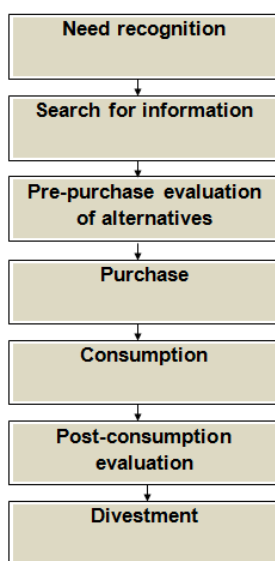
Figure 4. CDP model (Blackwell, Miniard, Engel 2001)

The CDP model explains the chronological order of a purchase decision made by a consumer. It starts with 'Problem Recognition', followed by 'Information Search', 'Evaluation of Alternatives', 'Purchase' to find its end at the 'Outcome'.

The CDP model is based on the idea that each purchase starts with a problem recognition or need recognition. After the consumer is aware of the shortcomings the possibilities of solving the problem will be 'searched' for. From the possibilities to fulfill the need, a set of alternatives is created and evaluated to decide up on the best perceived outcome. A decision is made as to which product or service to purchase, and the actual purchase then takes place. The product or service is used and afterwards it is decided on the outcome at the stage of 'Post-consumption evaluation'. The last stage of the model shows 'Divestment', which is the process of either disposing the product or for example reselling it (Blackwell et al., 2001)

The actual purchase decision is the forthcoming of the first 3 steps of this model, namely; Need Recognition, Search for Information, and Pre-Purchase Evaluation of Alternatives. These three steps are relevant in answering the second sub question;

How do crowdsourced (i.e. user-driven firms) products change the consumer decision making process as compared to standard products (i.e. designer-driven-firms)?

The first step that leads to the Purchase, is 'Need Recognition'. Individuals have many needs. These needs can be categorized into biogenic, or psychological states (e.g. hunger, thirst, discomfort), and psychogenic, or psychological states (e.g. recognition, esteem, belonging), previously described as intrinsic motivation (Nambisan and Nambisan, 2008). When these needs reach a sufficient level of intensity, they evolve to an act. Acting on needs is described as motives. (Kotler and Keller 2012). Freud's research on human motives states that people are unconscious, in that they cannot fully understand their own motives (Reynolds and Gutman, 1988). This shortcoming of the true image is due to the differences between the actual state and the perceived state. The perceived state, or perception is described by Kotler and Keller as follows; *"Perception is the process by which we select, organize, and interpret information inputs to create a meaningful picture of the world"*, (Kotler and Keller, 2012, p.98).

These perceptions depend on the relationships to the surrounding environment. As individuals get many stimuli from around them, they have an unconscious system, which screens out most of the advertisements that influence need recognition. This phenomenon is called 'selective attention'. Through the Web 2.0 and social media platforms, individuals come in touch with status updates and recommendations of connections (Kaplan and Haenlein, 2010). As individuals are increasingly active on social media platforms and increasingly sharing personal information and brand attitudes (Kaplan and Haenlein, 2010), one would expect that participants of crowdsourcing are likely to share their interest in their projects on their social media pages, as product involvement increases word-of-mouth behavior (Brown et al. 2007). This new way of word-of-mouth (WOM) communication, increases attention of individuals in the network of the co-creator, and might evoke need recognition, since relational environment has an effect on perception (Kotler and Keller, 2012).

After the need has been recognized, the individual will search for possible desires, with which the need can be satisfied (Blackwell et al., 2001). Where traditionally people would opt for advice in their surroundings and by inquiring expert's opinion, social media offers a more important role (Brown et al., 2007). Connections within the social media network are trusted, as they are relatives, friends, colleagues, or other people with which one has a tie. Individuals

have more trust in informal sources, as compared to mass media (Lumpkin et al., 1989). Since interaction on social media increases, one could expect that this changes the 'search for information', and will lead towards a spillover effect of co-creators' preferences for products, towards the individuals in the 'search for information' phase, through word-of-mouth. This process is verified by Brown et al. (2007) who state that 84% of Internet users have at the very least contacted one online community in their 'search for information' phase. Another unconscious activity is selective retention, which evokes in valuing attributes of a certain brand higher, while the exact same attribute in the product of a competing brand is perceived as less satisfying (Kotler and Keller, 2012). Given the fact that consumers actively search for information in their surroundings, and value the information provided by members of the network higher, the consumer might follow the lead of the co-creators within their network. The 'search for information' phase might lead to co-creation, rather than the 'evaluation of alternatives', which traditionally would follow, given the CDP model. Where Pralahad and Ramaswang (2004) claim that co-creation and with that consumer empowerment is the result of dissatisfaction of the consumers with the current available products, Kumar (2003) opts for the killing of brands due to an overload of supply in the form of brand extensions, line extensions, channel extensions and so on. This brings up the question of why consumers would want to co-create rather than search for and evaluate possible alternatives that would satisfy their needs. This leads to the following hypothesis;

H2; After interaction with co-creators within their social network, consumers are more likely to believe that crowdsourced products will fulfill their needs.

This hypothesis is expected to hold, given the fact that emotion is often a driver for choice, in contrast to the belief that consumers are rational decision makers. (Kotler and Keller, 2012). However, as Brown et al. (2007) explain, an important factor is the strength of the tie affiliated with the social network relation, which is described as the multi-dimensional, interpersonal relationship (Brown et al. 2007). The stronger the tie is, with the social network contact, the more intense and frequent the information flow is. One can conclude from this, that the tie strength of the co-creator within the social network will affect the steps prior to the purchase of the product, as described by Blackwell et al. (2001).

Perceived Consumer Risk In Product Adoption

> *"If risk was not a factor present in consumer decisions, there would be little consumer dissatisfaction –each purchaser would know the results of his behavior in advance, much like the unreal world of the economist's perfectly competitive market."*
> *Ronald W. Stampfl, 1978; 233.*

Within the consumer decision making process perceived risk and perceived benefits are essential factors, especially in consumer's evaluation and purchasing behavior (Ueland et al. 2012), as decisions about risk are always the decisions that are the basis of choice and evaluation of alternatives (Conchar et al.2004).

For this an analysis of perceived risk is crucial in answering the research question. This section will elaborate on the topic by means of the following sub question;

What is the role of perceived risk in the purchase decision of a crowdsourced product (i.e. user-driven firms) as compared to a standard product (i.e. designer-driven firms) in terms of consumer evaluation?

Every choice that is made is a trade-off between the perceived benefits and perceived risks that are associated with the choice. When the perceived benefits are considered higher than the perceived risk, purchase can take place (Ueland et al., 2012). Meaning, the net outcome of the positive and negative attributes of perception will lead to either rejection or purchase of the product (Kim et al. 2008). Conchar et al. (2004, p.419) define risk as; *'The multidimensional probability distribution of realizing losses on a range of dimensions'*. In essence, risk is viewed as the consumer behavior that leads to consequences and outcomes, which might be unpleasant, where consumer cannot, by forehand, anticipate on (Bauer, 1960).

Jacoby and Kaplan (1972) distinguish five dimensions of perceived risk in the purchase of products. These dimensions are adopted in many research papers, among which Ueland et al. (2012); Bhattacherjee (2002); Simcock et al. (2006); Conchar et al. (2004). The five dimensions of perceived risk described by Jacoby and Kaplan(1972) include; Performance

risk (the failure of the product to perform as expected), time (the effort and time invested in the purchase), social risk (the potential loss of self-esteem, respect and friendship), psychological risk (disruption of self-image), and financial risk (the potential loss of money).

These risks are the result of uncertainty and the expectations and importance of losses in the form of related consequences (Conchar et al., 2004). In assessing potential risks one could focus on situations or on the individual characteristics of the decision maker. However, Conchar et al. (2004) state that the same individuals may act differently given the situations, as individuals assign different subjective probabilities to circumstances. For this, the choice is made to focus on the situational factors influencing consumer behavior, as described by Jacoby and Kaplan (1972).

Performance Risk

Performance risk, also referred to as product risk or functionality risk (Sääksjärvi and Lampinen, 2005) is the first risk factor to be discussed. Performance is a fundamental factor in innovation adoption (Bauer, 1967). Sääksjärvi and Lampinen (2005) distinguish between two types of innovation; the original innovation, where the new innovation is marketed, and the modified successor (Rogers, 1995) or incremental innovation (Schweitzer et al., 2012), where attributes or functional changes have been made to an existing innovation. Based on intuition one would think that the modified successor brings less uncertainty and risk as compared to an original innovation, research of Sääksjärvi and Lampinen (2005) proves to be counterintuitive. In the case of an modified successor, the consumer's expectations for the product are higher, as they are already familiar with the original innovation, and are uncertain of the improvements that a modified successor could offer. Crowdsourcing is used for both original innovation idea generation as well as incremental, or modified successor, product innovations (Schweitzer et al., 2012). In this setting, as compared to the traditional production, there are no modifications since the introduction of co-creation. However, as user-driven products are the forthcoming of co-creation between firms and co-creators, the relation between consumers and organizations changes (Voß et al.,2008). Due to the changing relation, one could expect change in assessment of the performance of products that are user-driven. An important aspect that affects perceived risk is trust. Trust is a key element of social capital and for this it is considered to be essential in any exchange relation (Kim et al., 2008). Kim et al. (2008) analyze several definitions of trust and describe it as a global belief of the

buyer that the parties involved in the purchase will fulfill their obligations. Gambetta (1988) explains that trust is especially important in situations where uncertainty holds.

As stated earlier, the net outcome of the balance between perceived benefit and perceived risk is the driver of purchase (Kim et al., 2008). Siegrist (2008) explains that benefits through messages from trusted sources are more easily perceived by individuals. Increased benefit perception will lead to a higher net outcome, and an increased probability for purchase, since benefits modify the perception of risk (Grunert, 2002). In a designer-driven situation messages are sent by firms, and trustees are the relatives. However, in a user-driven situation, the relative that creates the word-of-mouth behavior, is the co-creator, and might to a lesser extent, as compared in the designer-driven ecosystem, be trusted, since the co-creator is subjective due to his or her occupation as a prosumer. The exact effects of this changing relation of trustees in the user-driven environment is the fundamental idea behind hypothesis 1, and will be examined trough research. In a designer-driven system, products are the result of intense focus group testing and analyses, before launch, where crowdsourcing enables companies to save money on research, by obtaining direct information through platforms (Schweitzer et al., 2012). Trust in the quality of the products provided by the user-driven firm might diminish, as the quality of the ideas gained through crowdsourcing, depend on the degree to which the user-driven-firm is able to attract creative and knowledgeable participants in the co-creation process (Schweitzer et al., 2012). As Yeung et al. (2011) enlighten, when faced with uncertainty, individuals in search of quality turn to trusted providers. As co-creators are unknown, and the process of product development and product testing in a user-driven setting is less intensive, one would expect an increase in performance risk, and with this a decrease in product quality. This leads to the following hypothesis;

H3; Consumers believe crowdsourcing brings a lower quality product than products that are the result of the traditional supply chain.

One would expect that this hypothesis will hold, as consumers will face more performance risk, expect a lower quality product, in situation of more uncertainty, as is the case with co-created produce.

Time Risk

Whereas the performance risk is influenced by introducing a user-driven system, the time risk, mentioned by Jacoby and Kaplan (1972) does not change that much, as compared to the designer-driven system. The consumer has to put the same amount of effort and time in the actual purchase of the product. This risk factor is however changed due to the empowerment and more active attitude of consumers (Pralahad and Ramaswang, 2004). The decreasing costs of internet usage (Füller et al., 2010) and the increase of social media interactions (Kaplan and Haenlein, 2010) change the information search phase. An increase in information, diminishes uncertainty, which is a driver of risk perception (Kim et al., 2008). From this one can conclude that consumer empowerment and the availability of information sources have led to a decrease in time and effort risk. However, this decrease is not to be distinguished between designer-driven and user-driven products, as both of these categories are operating in the same environment.

Social Risk

A risk driver that might influence the introduction of crowdsourced products, is social risk. Social risk is mostly linked to self-esteem and respect (Choi et al, 2013). The risk in the social environment lies within group acceptance (Lee, 2009). One might find risk in the possibility of appearing silly or unstylish (Lee, 2009), depending on the social norm of the group. Snoj et al. (2004) found that social risk is perceived higher in appearance goods, and goods that are easily noticed by others. If many individuals in the social network are co-creating and are purchasing and recommending co-created products, this may influence the social norm of the group. Not participating in co-creation or not purchasing user-driven products, while the social network does, may increase the social risk of the purchase of designer-driven products. One could say that purchase of user-driven products are perceived to have less social risk, if the social network is purchasing or participating in co-creation, whereas the purchase intention of a designer-driven product will be perceived to have higher social risk, if the group standard is crowdsourcing.

Psychological Risk

The next risk driver mentioned by Jacoby and Kaplan (1972) is psychological risk. Murray & Schlacter (1990), describe psychological risk as a threat to self-image or self-concept. An example of psychological risk would be the negative effect on ego when purchasing a

defective product (Snoj et al., 2004). As in the case of performance risk, purchasing a product which is the result of co-creation between the firm and a group of unknown and unfamiliar working consumers might increase uncertainty in the purchase decision (Kim et al., 2008). From this one could state that the perceived risk of harming the own ego, due to purchase of an unsatisfying product, increases with co-creation, because of increased uncertainty.

Financial Risk

Consumers perceive financial risk in every single transaction involving monetary means (Snoj et al., 2004). The financial risks are associated with getting the money's worth. If the product does not satisfy enough to cover the costs of the product, the purchase will lead to disappointment (Jacoby and Kaplan, 1972). Where Schweitzer et al. (2012) assigned cost saving as a benefit of crowdsourcing for the organization, the relative retail prices of the co-created products are not lower as compared to the traditional products. Customization even leads to the possibility of asking higher prices for the produce, for example customizing your Nike shoes on the website of www.nike.com leads to higher prices than the designer-driven products of Nike. Dodds et al. (1991) indicate that quality perception is positively influenced by pricing. When a product is priced higher, the consumer expects a higher quality. However, higher prices do influence financial risk negatively, since reassurance is necessary to diminish the greater financial risk (Simcock et al., 2006). As consumers considering the purchase of user-driven products are faced with the same or even higher prices for the product, they might perceive higher financial risk.

After analyzing all of the risk factors of Jacoby and Kaplan (1972), the following hypothesis can be formed;

H4; Consumers in general perceive a higher expected risk when the product is the result of crowdsourcing.

As an analysis of theory suggests that performance risk, social risk, psychological risk and financial risk increase in crowdsourced products, the total perceived risk, described by Bauer (1960) should increase as well. For this, one would expect that hypothesis 4 will hold.

Product Involvement and Product Category

So far, the focus in risk perception has been solely on consumers not participating in crowdsourcing initiatives. Production involvement, however, has an effect on risk perception as well. In order to shed light on this phenomena, and on the perceptions involved in product categories, the following sub question will be elaborated on;

How do product involvement and product category influence the assessment of a crowdsourced product (i.e. user-driven firm)?

Pillar et al. (2005) make clear that the collaborative customer co-design process increases involvement, as co-creators have the opportunity to, not only co-create, but also interact with other members of the community and evaluate ideas of participants on platforms. Son et al. (2012) argue that involvement in crowdsourcing increases social risk, due to mass confusion, by means of information overload, and subjective expectations. Furthermore, Son et al. (2012) distinguish perceived playfulness in the process of co-creation and perceived usefulness of the end product. They found a positive relation between purchase and perceived usefulness. However, they explain that perceived playfulness increases participation in the co-creation process and adoption of the co-created product, as perceived playfulness is considered to be more important than functionality, or performance. This is in line with Plötner et al. (2013) who explain that the experience is of higher significance than the product itself, as consumers search for solutions, not for products. Prosumers are considered having a relation, or tie, with the firm they are co-creating with (Leismeister, 2010). In a traditional setting, there is said to be more trust between suppliers and consumers when a bound is created, which leads to an obsolete need for evaluating alternatives (Plötner et al., 2013). Due to this tie, co-creators perceive the organization as a trusted source of information, and benefits are more easily acknowledged (Siegrist, 2008). Verbeke et al. (2007) make a distinction between consumers and experts in decision making. Where consumers have a more emotional and contextual perspective in dealing with risk, experts are considered to be more factual. Since prosumers are partial employees (Voß et al.,2008), and are active participants (Son et al. (2012), they can be viewed up on as experts. When risk process is more factual, the expectations towards the product will be more precise. Furthermore, Verbeke et al. (2007) explain that risks that do not exist, can be perceived as presents, whereas, real hazards might not be considered threatening at all. This is due to the fact that perceptions and the actual situation may vary (Verbeke et al. 2007). Ueland et al. (2001) ad to this the existence of control, when one can influence a

decision, the feeling of control decreases perceived risk, as is the case in prior participation in the crowdsourcing process before purchase.

Another factor of importance, again, is trust. Since the prosumer has been involved in the co-creation process, he already had to overcome the risks associated with participation in co-creation initiatives, and has a feeling of trust towards the organization. As Kim et al. (2008) explain, trust reduces perceived risk.

From this one could conclude that, due to process involvement, co-creators are more likely to assess the user-driven product as factual, meaning the risk perception is closer to the real risk associated with the product.

This leads to the following hypothesis;

H5; Consumers who have participated in the crowdsourcing process perceive lower risk in the purchase of the user-driven product than consumers who have not participated in the co-creation process.

So far, the influence of process involvement has been discussed. However, in order to fully understand the effect of product category and product involvement in the purchase decision of a co-created product, a further explanation of the two phenomena is essential. Product category is often referred to as product importance, which eventually can lead to product involvement (Bloch and Richins, 1983).

Product involvement can be either situational (e.g. instrumental) or enduring. Situational product involvement is the interest of a purchaser due to the need to purchase (Dholakia, 2001), for example when a product needs to be replaced. Purchase optimality is the aim of involvement (Bloch and Richins, 1983). In the case of enduring involvement, the involvement process is long-term, and the trigger is usage satisfaction (Bloch and Richins, 1983).

As explained, product involvement always follows from product importance, as an individual will never feel involved with a product that he or she does not find important (Bloch and Richins, 1983). Product importance is another way of looking at product category. It describes the perception of an individual that the purchase of the product brings attributes that matter

(Bloch and Richins, 1983). Bauer (1967) associates product importance with the amount of money at stake, and extent of loss or pain, that a product might bring. However Bloch and Richins (1983), have expanded this view by dividing three components that make up for the perceived product importance. The first component is 'product characteristics', which is the nature of the product. The factors that lead to product importance are the costs of the product, the potential of the product to do harm, and the length of the commitment with the product. 'Product usage characteristics' and 'characteristics of the consumer' follow. Where product usage is linked again with the length, and the characteristics of the consumer contain personal traits, the self-concept (of Jacoby and Kaplan), the specific consumer needs, and the social role of the consumer among others (Bloch and Richins, 1983).

Since product characteristics are more general and applicable than, for example the consumer characteristics (Bloch and Richins, 1983), in assessing the significance of product category, or product importance, only these will be used.

Participation in co-creation, as a form of product involvement, brings some additional consequences. Hunt et al. (2012), explain that co-creation leads to strong purchase and repurchase intentions, positive WOM, and the willingness to pay more for a product. However, since products of high importance incorporate higher purchase risk due to the higher costs, greater potential to do harm, or longer commitment to the product, one could conclude that adoption of a more risky product, as the user-driven product, might be avoided. This leads to the following hypothesis;

H6; Consumers are more likely to purchase user-driven products of low product importance (i.e. involvement), than user-driven products of high product importance (i.e. involvement).

Snoj et al.(2004), for example, clarify that social risk is higher in products that are easily viewable by others, as compared to products that are personal and not directly apparent by the environment. Social risk is one of the drivers of total perceived risk, so one can conclude that research of Snoj et al. (2004) is in line with the stated hypothesis. However, research of Etgar (2008) states that co-production will take place in product groups, based on the number of attributes. Products with little attributes, such as washing machines, are less likely to be co-created, as compared to laptops, that are made out of many attributes, which form the product.

In line with the hypothesis, Etgar (2008) does stress that importance of the product affects the possibility of co-creation, which again, supports hypothesis 6.

Importance of Brands

As stressed earlier in this paper, co-creating firms consist of two categories, traditionally operating organizations that ad co-creation to their strategy, such as Microsoft, Nokia and Volvo (e.g. Hammon and Hippner, 2012; Füller et al.,2010), and organization set up purely based on the idea of co-creation, specifically open-innovation, such as Threadless.com and iStockphoto.com (e.g. Nambisan and Nambisan, 2008; Brabham, 2010). As traditionally operating companies already have brand perception, whereas pure co-creation firms are less known, the question of the importance of the brand arises. Based on this, the following sub question is formed;

What is the importance of a known brand in the co-creation process (i.e. user-driven firm)?

According to Kim et al. (2008) in long-term relationships with consumer, trust and satisfaction are essential components. Kim et al. (2008) also explain that trust and expectations have a positive effect on satisfaction. The more trust the consumer has in the organization, the more likely he or she is to be satisfied. Customer satisfaction, however, is the post-purchase evaluation of the purchase and depends on the expectation of the consumer as compared to the benefits he or she actually receives (Kim et al., 2008). When a product has been purchased previously, more trust is established between the company and the purchaser. Simcock et al. (2006) state that the more trust a consumer has in a seller, the higher the expectations and the more likely the consumer is to be satisfied. When a brand is pre-existent before implementation of co-creation initiatives, trust is more likely to have been formed in the perception of the consumer (Kim et al., 2008) and benefits are more easily perceived by the consumer (Siegrist, 2008). Krishnamunthy (2001), explains that risk reduction takes place through WOM, customized information and brands. Ha (2002) distinguishes three factors which influence the information search phase of the product purchase decision.

1. Prior experience with the brand or product;
2. Recommendations in the social network through WOM;
3. Brand specific imprinting as a result of advertisements.

Consumer who have not participated in co-creation, do not have any experience with the user-driven brand, nor do they have any brand specific imprinting. Ha (2002) has examined the associated perceived risk in the online decision making process, and found that perceived time risk, and perceived performance risk are reduced in products offered by brands with which the consumer is familiar. These findings lead to the following hypothesis;

H7; The perceived risk of consumers is lower when the co-created product is offered by a known brand (designer-driven brand that has adopted user-driven activities), as compared to the unknown brand (purely user-driven firm).

Conceptual Framework

The theoretical framework has, in sum, led to the development of the following hypotheses.

H1; Consumers have more trust in advice and recommendations when these concern designer-driven products, than they have in advice and recommendations, provided by co-creators, concerning user-driven products

H2; After interaction with co-creators within their social network, consumers are more likely to believe that crowdsourced products will fulfill their needs.

H3: Consumers believe crowdsourcing brings a lower quality product than products that are the result of the traditional supply chain.

H4; Consumers in general perceive a higher expected risk when the product is the result of crowdsourcing.

H5; Consumers who have participated in the crowdsourcing process perceive lower risk in the purchase of the user-driven product than consumers who have not participated in the co-creation process.

H6; Consumers are more likely to purchase user-driven products of low product importance (i.e. involvement), than user-driven products of high product importance (i.e. involvement).

H7; The perceived risk of consumers is lower when the co-created product is offered by a known brand (designer-driven brand that has adopted user-driven activities), as compared to the unknown brand (purely user-driven firm).

The relation between these hypothesis are shown in the following conceptual framework.
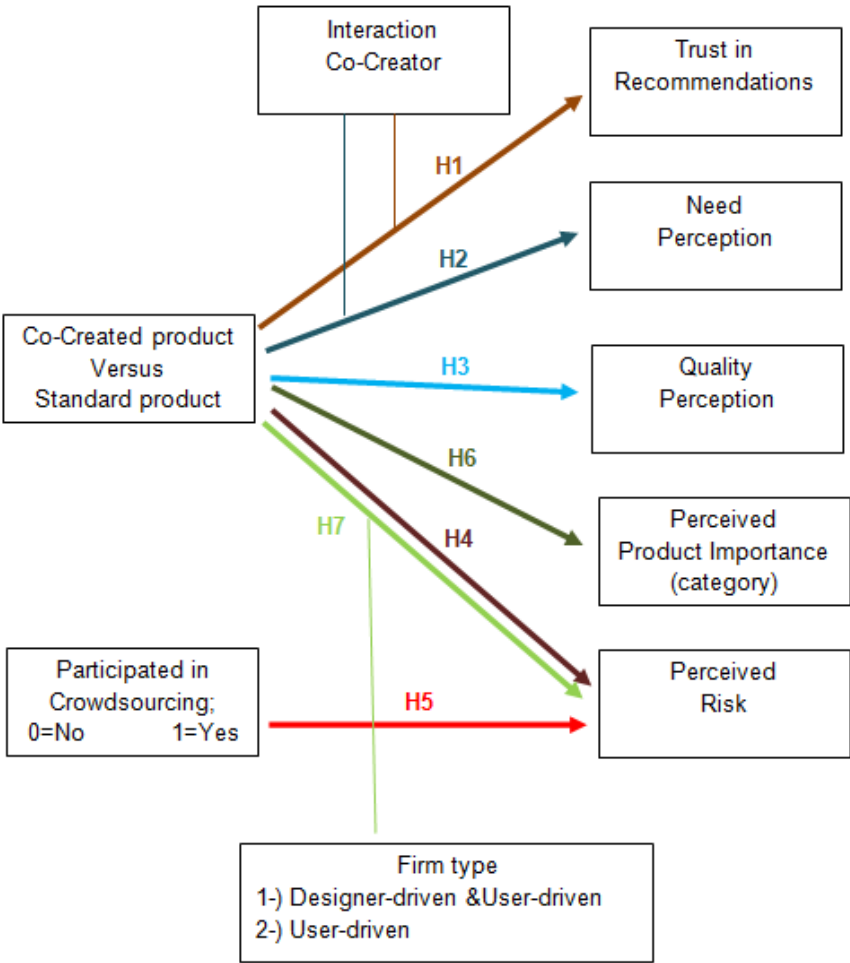
Figure 5. Conceptual Framework

After the data collection, this conceptual framework will be used in the data analysis section of the paper to measure the effects of the factors described in the hypotheses.

Methodology

This section of the paper will describe the research design and motivate the methods that were used accordingly.

Research Method

Within the field of marketing research three purposes can be distinguished, namely; exploratory, descriptive and causal, or explanatory (Mullins and Walker, 2010). These research purposes can be assigned to a research study as a whole, but more often different phases of a study make use of different methods. Meaning that a research study can consist of more than one single marketing research method (Babbie, 2007).

Where the main purpose of exploratory research is to develop an understanding of an unknown occurrence, in both descriptive and causal research the influences are already known. Descriptive methods aim to measure characteristics of a population, where causal methods are focused on explaining these characteristics (Babbie, 2007).

The main goal of this research is to answer the question;

As compared to the purchase of standard products, how are crowdsourcing initiatives influencing the purchase behavior of consumers who do not participate in open-innovation activities?

By means of the literature review an understanding is created of the phenomena to be examined, namely; the differences between participants and non-participants of co-creation activities. The main objective of this research is to examine if any differences between these two groups exist. This research objective is descriptive. However, based on the literature review, several possible factors that might differ between participants and non-participants of co-creation are detected and translated into the hypotheses that will be tested. These factors are not the result of statistical methods, but pre-determined by use of the literature review. For this reason, the research method cannot be qualified as causal. By use of the descriptive research purpose, differences between the two groups will be explained.

Where the exploratory method makes use of qualitative data, for example trough in-depth interviews or focus groups, both causal and descriptive research make use of quantitative data. Quantitative research data allows for statistical analysis by which, with some confidence, the

results of the data analysis will represent the population as a whole. Furthermore, the larger sample size, as compared to qualitative data, allows for higher accuracy (Mullins and Walker, 2010). Since the aim of this paper is to shed light on the purchase behavior of a relatively large group, the non-participants of co-creation initiatives, a quantitative approach is used, in the form of an on-line survey.

As current available studies to our best knowledge, with exception of Schreier et al. (2012), have not distinguished between participants and non-participants of co-creation initiatives, no secondary data is available that would meet the requirements of possibly answering the research question. For this reason primary data is collected for the purpose of this research. However, it must be said that, besides the fact that collecting primary data is more costly and time consuming as compared to obtaining secondary data (Kotler and Keller, 2012), overall secondary data are considered more reliable as they often are based on 'what people do', rather than 'what people say' (Mullins and Walker, 2010).

The quantitative method of data collection for this research is done through an online experimental survey. To enable examination of all seven hypotheses a total of 8 products is presented trough the survey. The products presented to the respondents had to consist of several factors, namely; co-created/user-driven product and standard/designer-driven product (H1, H2, H3, H5), low involvement and high involvement products (H6), known and unknown brand (H7).

Product Choice

Based on the criteria of Bauer (1967) and Bloch and Richins (1983) products were selected of 'low perceived importance' and 'high perceived importance'. A product is considered of low importance when the amount of money at stake is relatively low, the extent of loss is low and length of the commitment to the product is short (Bauer 1967; Bloch and Richins 1983). Based on these conditions the choice is made to use chips as a low involvement product, as purchasing a bag of chips is a decision related to low costs, low extent of loss and the consumption period of chips is relatively short. As a high involvement product, laptops are chosen, since laptops cost relatively much, the length of the commitment to the product (usage) is relatively long and the potential loss of a bad choice is much higher.

Besides the criteria of low product involvement and high product involvement, the products should also be of both designer-driven and user-driven type. For chips the brand Lay's was selected.

PepsiCo's company Lay's, besides the standard designer-driven flavors, also has an online platform called Superfans, where most co-creation activity takes place through the SuperFans Facebook page. The co-creation initiative of Lay's Netherlands started off in 2010 with the launch of the 'Maak je smaak' (design your flavor), campaign (Van Meer en Meuleman, 2012). Through an 8 week period of advertisement, consumers were stimulated to present their designed flavor, where after an expert jury selected the three most promising flavors. These flavors were launched in stores for sales, so that consumers could buy it, test it and vote on their favorite flavor. The winning flavor designer received a 25.000 euro reward and an additional 1% of total sales. This co-creation initiative was considered extremely successful as 6 million units of the 3 finalists' test flavors, that could be voted on, were sold in the 2 month period (Van Meer and Meuleman, 2012). Due to this success, Lay's has implemented co-creation in their daily activities, through the Superfans Facebook page.

As for the high involvement product laptops, the company Dell was selected, since Dell too offers both standard as well as co-created products. Since its launch, Dell has offered customized laptops on their website. As of 2007, however, Dell has invited consumers to participate on their IdeaStorm platform, an open-innovation platform on the Dell website, where ideas can be submitted, discussed with other members and voted upon (Di Gangi and Wasco, 2010). Due to the implementation of the IdeaStorm community Dell now is more capable of dealing witch concerns of consumers and understanding the innovation process adoption of its customers (Di Gangi and Wasco, 2010).

An additional product differentiation was necessary in order to examine the differences between known and unknown brands. However, due to the possibility of familiarity with an existing brand and the cognitive influence of the packaging, the choice had been made to present the exact same products in the survey, but change the names and the logos of the products on the pictures shown in the survey, in order to measure the difference between known and unknown brands purely based on the name of the product. The unknown brand representing Lay's was named Crisp. For Dell the unknown brand variant was called Chip.

For co-created versus standard product, the same strategy was used as for known and unknown brands. Respondents were shown the exact same picture, however one variant showed the picture pretending the product to be standard, while the same picture was used with the explanation that the product was co-created. Again the reason for this tactic was to measure solely the effect of co-creation, ceteris paribus.

	Low Perceived Importance		High Perceived Importance	
	Known Brand	**Unknown Brand**	**Known Brand**	**Unknown Brand**
Standard Product	Lay's (Standard Product)	Crisp (Standard Product)	Dell (Standard Product)	Chip (Standard Product)
Co-Created Product	Lay's (Co-Created Product)	Crisp (Co-Created Product)	Dell (Co-Created Product)	Chip (Co-Created Product)

Figure 6. Survey product choice overview.

Rather than providing 8 surveys, the choice was made to present both a co-created and standard product to respondents, as they were informed that the research topic is co-creation. However, since the exact same pictures were presented per product type (laptop and chips), respondents might realize that the survey was experimental. For these reasons it was chosen to include a randomizer in the survey, so that after the introduction respondents were randomly assigned to one of the 4 setups, preventing the situations mentioned above. The setup consisted of the following 2 products;

➢ Set 1; Lay's standard and Chip co-created
➢ Set 2; Chip standard and Lay's co-created
➢ Set 3; Dell standard and Crisp co-created
➢ Set 4; Crisp standard and Dell co-created

	Set/Group 1	Set/Group 2	Set/Group 3	Set/Group 4
Standard Product	Lay's (Standard Product)	Chip (Standard Product)	Dell (Standard Product)	Crisp (Standard Product)
Co-Created Product	Chip (Co-Created Product)	Lay's (Co-Created Product)	Crisp (Co-Created Product)	Dell (Co-Created Product)

Figure 7. Survey product set randomization.

Furthermore, this structure enables examination of standard versus co-creation, low involvement versus high involvement and known versus unknown brand per set. Given this

setting, the effects of co-creation are examined between surveys sets, rather than within survey sets, ensuring independent observations, per test no one consumer is observed more than once. Independent observations are one of the main criteria for statistical parametric test (Howell, 1997). This is a method that will be further elaborated on in this methodology section of the paper.

Sample Characteristics

This section will reason the sampling methods and sample size that were chosen

Sampling Method

The sampling method used for this research is nonprobability quota sampling. Where all hypotheses, with exception of hypothesis 6, are focused on the differences between co-creation products and standard products, H6 examines the differences in risk perception between participants of co-creation and non-participants. In order to differentiate between these two groups the previous experience in co-creation is an essential factor to discriminate on. As will be explained in the 'Sample Size' section following, a minimum quota of 30 respondents per cell is necessary. Meaning at least 30 respondents should have some sort of past experience as participant in a co-creation activity versus a minimum quota of 30 non-participants.

As the length of the survey and the corresponding time needed to fulfill the survey was quite long (approximately 15-20 minutes), respondents were by forehand stimulated by offering a fixed reward, in the form of a discount. Horlogewinkel.nl, an online jewelry store, provided discount codes for purchases on their website. Additionally respondents got the opportunity to leave their contact details in order to participate in the lottery, where trough random selection a watch would be given away.

The quota sample of non-participants was relatively easy to fulfill by spreading the survey on social media, LinkedIn and Facebook, and by asking respondents to share the link to the survey on their personal profile of Facebook, creating a snowball effect.

The quota sample of co-creation participants required other methods. Since experience in co-creation participation is still relatively rare in the consumer market, finding respondents that satisfy these criteria is difficult. In the period of the brand choice selection multiple emails

were send out to companies that offered their customers some sort of open-innovation platform, also companies that solely offer open-innovation platforms to brands that outsource their co-creation initiative were contacted, for example Innocentive.

After contacting the Dutch Lay's team through their Facebook page, they showed interest in the research topic and offered to spread the link to the survey, which was created on the website of Qualtrics, to their so called Superfans Servicedesk workers, which are volunteer co-creators.

Figure 8. Superfan Servicedesk Facebook page

However, only 6 responses were collected that actually had participated in the co-creation process of Lay's.

Numerous attempts of motivating Dell to contribute to the research by spreading the survey were turned down, as they claim to be participating in multiple research projects conducted by themselves already. Eventually, Dell Netherlands offered to spread the link of the survey through their twitter account.

Figure 9. Dell Tweet Spreading Link

As this twitter message had not led to any responses, more attempts had followed to stimulate Dell to participate. The IdeaStorm manager had responded to an email, offering to spread the

link to some of his own close contact that participate on IdeaStorm, due to his own personal interest. Unfortunately, this too had led to little response, namely one.

Since the Erasmus School of Economics had recently conducted a co-creation activity as well, where students proposed innovation initiatives for the university, ESE Innovation Tournament, the link to the survey was spread on the Facebook group of the student participants of this tournament, which led to an additional 3 responses.

Furthermore, the link of the survey has been spread on multiple LinkedIn groups and Facebook groups that had some sort of tie with co-creation. Additionally the survey question measuring past experience with co-creation offered an alternative open answer possibility for participants of other platforms. This option resulted in a cell quota of 25, adding up to validation of the total co-creation quota. Figure 10 shows the previous participation experience.

#	Answer	Response	%
1	No, I have never participated	134	70%
2	I am not sure, I cannot recall.	22	12%
3	Yes, I have participated/participate on the Lay's Super Fans platform	6	3%
4	Yes, I have participated/participate on the Dell platform	1	1%
5	Yes, I have participated in the ESE innovation tournament of Erasmus School of Economics	3	2%
6	Yes, I have participated/participate for another company, on another platform. The name of the company is;	25	13%
	Total	191	100%

Figure 10. Survey question results. "Have you ever participated in a co-creation activity?"

Sample Size

Statistical inference involves four types of inference variables, namely; statistical power, the sample size, the population effect size and the significance criterion (Cohen, 1992). The most common significance level in research is α=0,05, which means that the probability of falsely rejecting the null hypothesis is set to 5%. The effect size resembles the magnitude of the difference between the hypothesis and null hypothesis. The statistical power resembles the

longitude probability given the other three variables, of rejecting the null hypothesis. This statistical power is usually set at $\beta=0,8$ for a $\alpha=0,05$ significance level. The probability of falsely drawing conclusions from statistical test, as mentioned, is also dependent on the sample size (Cohen, 1992). As these four variables need to be coherent in order to make conclusions based on the statistical research, it is of great importance to select the proper sample size, which will enable generalizing conclusions based on the data to hold for the population as a whole (Babbie, 2007).

The hypothesis of the descriptive research that will be examined will be tested by use of ANOVA and paired sample t-tests, as these are the statistical methods for parametric relational testing. Further on in this paper an explanation will be given for the reason to use these tests. Given the $\alpha=0,05$ significance level, the $\beta=0,8$ statistical power and a Medium to Large effect size, a sample size N is necessary to draw confident conclusions. In the case of ANOVA and paired sample t-tests a minimum of 30 participants per cell is necessary as a rule of thumb (Cohen, 1988).

As this research examines differences across four products, respondents are randomly assigned to one of the four sets, a minimum of 120 respondents is needed for each cell to load at the minimum of 30 per cell.

For this research the experimental survey is conducted using Qualtrics, an online survey response system. The Qualtrics student account allows for a maximum number of 250 respondents to be recorded, and thus this platform qualified for the data collection.

Questionnaire Design

As mentioned previously, the survey was constructed using Qualtrics. The purpose of the questionnaire is to provide measures which can be tested statistically so that the hypotheses can be answered. Accordingly, the questions involve the hypotheses and the corresponding topics as shown in the conceptual framework of Figure 5. In addition to these topics, several control variables were selected to increase reliability and foresee any possible other effects. These will be elaborated on further in this section of the paper.

After a pilot test with 10 respondents, some changes were made to the survey based on the feedback received from the respondents in the test phase. Two measures additionally added to the questionnaire were Brand Likeability and Product Involvement, as respondents in the test phase claimed they were influenced by the product type, they would not consider purchasing chips, and the brand choice, they would never purchase a product from Dell. The additional scales for Brand Likeability and Product Involvement allowed for measurement of these phenomena. By comparing these two measures between the groups, possible influences due to these factors can be detected. The final survey structure, including the randomization, is displayed in figure 11.

Block 1 (Introduction)			
Explanation of survey			
Explanation of co-creation & Example video Heineken			
Previous participation in co-creation á Priori Satisfaction co-creation chips á Priori Satisfaction co-creation laptop			
Block 2			
Product importance/decision importance laptop			
Product importance/decision importance chips			
Block 3			
Standard products			
Lay's	**Chip (unknown brand)**	**Dell**	**Crisp (unknown brand)**
Brand likeability		Brand likeability	
Design expertise			
Perceived risk			
Perceived quality risk perception			
Perceived financial risk perception			
Willingness to pay			
Purchase likelihood			
Recommendation			
Trust in WOM recommendation			
Purchase likelihood			
Co-created products			
Chip (unknown brand)	**Lay's**	**Crisp (unknown brand**	**Dell**
	Brand likeability		Brand likeability
Design expertise			
Perceived risk			
Perceived quality risk perception			
Perceived financial risk perception			
Willingness to pay			
Purchase likelihood			
Recommendation			
Trust in WOM recommendation			
Purchase likelihood			
Block 4 (The End)			
Age			
Gender			

Figure 11. Questionnaire Topic Overview

Besides the previous participation measurement, all measures used throughout the questionnaire were pre-existing multi-item scales, which were already successfully tested for reliability based on constructs like Cronbach's alpha. These multi-item scales were selected

from research papers related to the specific topics. Figure 12 provides an overview of the multi-item scales used in this research, the source of the scales and the number of items per scale. All of the scales used in this research will be discussed briefly.

Multi-item Scale	Source of Measure	Number of items
á Priori Satisfaction	Taylor and Baker (1994)	3
Task Importance/Involvement	Smith et al. (2005)	3
Brand Attitude/Likeability	Spears and Singh (2012)	5
Design Expertise	Schreier et al. (2012)	2
Perceived Overall Risk	Stone and Grönhaug (1993)	3
Functional/Performance Risk	Mieres et al. (2005)	4
Financial Risk	Mieres et al. (2005)	3
Purchase likelihood	Schreier et al. (2012)	4
Trust in WOM recommendation	Gilly et al. (1998)	6
Different Scale Type	**Source of Measure**	**Number of items**
Willingness To Pay	Monroe et al. (1998)	2
Previous Co-Creation Participation	Self Constructed	1

Figure 12. Research Specific Scales

Á Priori Satisfaction Scale

The Á Priori Satisfaction multi-item scale (Taylor and Baker, 1994), is a measure for need recognition. This measure is used to examine the satisfaction of a purchase intention. Originally the scale constructed by Taylor and Baker (1994) consisted of 4 items, however, the fourth item had a low alpha score ($\alpha=0,5690$). After dropping the last item from the scale the 3 remaining scales showed an extremely high score of $\alpha=0,9367$. The items were measured using a seven-point Likert scale (1=strongly disagree, 7=strongly agree). For this research the 3 item scales are used with the exact same measurements.

Product Involvement Scale

The research of Smith et al. (2005) examines the online shopping behavior and the effects of recommendations. One of the multi-item scales used in this paper is Task Importance, or Product Involvement, which consists of a three item scale. The Cronbach alpha for this score is 0,83, which is considered high. Measurement is done using a seven-point Likert scale. This scale was added to the questionnaire, after the test phase, to depict any differences in product involvement between the evaluation of standard products as compared to co-created products, as these concern observations of two different groups.

Brand Likeability Scale

For Brand Attitude, or Brand Likeability, the multi-item scale of Spears and Singh (2012) is used. This scale consists of 5 attributes, measuring the feelings towards the brand against a

seven-point Likert scale. This scale was added to the questionnaire, after the test phase, to depict any differences in Brand Likeability between the evaluation of standard products as compared to co-created products, as these concern observations of two different groups.

Perceived Overall Risk Scale

The Perceived Risk scale originally consists of 6 risk dimensions that each are measured using a 3 item scale (Jacoby and Kaplan, 1972). However, research of Stone and Grönhaug (1993) examines the influence of the separate risk factors on the total perceived risk. They find that the total risk, containing solely 3 items, captures 88,9% of the total risk measured per dimension. Furthermore, the dimension physical risk did not even seem to be significant. For this reason the Overall Perceived Risk multi-item scale of Stone and Grönhaug (1993) consisting of 3 items, measured at a seven-point Likert scale, is used in this research.

Financial Risk Scale and Quality Risk Scale

Although, as previously explained, Overall Risk captures 88,9% of the original risk scale, given the product types and the literature review, the choice is made to additionally include scales for measurement for Perceived Quality Risk as well as, Perceived Financial Risk. These scales are constructed by Mieres et al. (2006). Perceived Performance (or Quality) Risk consists of 4 items, where Financial Risk involves 3 items. Both scales are measured using a seven-point Likert scale (1=strongly disagree, 7=strongly agree). In their research Mieres et al. (2006) make a comparison of national brand versus store brand, using a 2x2 model, based on 2 products (kitchen rolls and shampoo). The Cronbach alpha for the scale Perceived Quality Risk is between α=0,781 and α=0,908 across the products. For the Perceived Financial Risk the alpha scores range between α=0,813 and α=0,904.

Trust In Word-of-Mouth Recommendation Scale

The Trust In Word-of-Mouth Recommendation scale of Gilly et al. (1998) is used in an experimental setting. First consumers are shown a picture of a product and questions are asked about this product and the perceptions. There after a recommendation of that product is given, followed by the Trust In Word-of-Mouth scale. The scale consists of 6 items measures on a seven-point Likert scale (1=strongly disagree, 7=strongly agree). Of the 6 questions 2 use reversed items, as they are negative whereas the other items are positive. The Cronbach alpha score is 0,82.

Purchase Likelihood Scale and Design Expertise Scale

Schreier et al. (2012) to our best knowledge, are the only researchers examining differences between standard and co-created products. Their research paper consists of a total of 4 studies. Of the scales used in this research paper 2 are adopted from the paper of Schreier et al. (2012). The first scale is the Purchase Likelihood scale. This scale originally consists of 5 items with a Cronbach alpha score of 0,87. However, their methodology is very experimental, as they use varying scale points and measurements (Likert, Juster, semantic differential). The last item, which they had adopted from Bruner and Hensel (2001) was dropped as they themselves did not use this item for all 4 of their studies, and the item is not relevant for this research objective. Furthermore, the Design Expertise multi-item scale used in the study of Schreier et al. (2012) is used in this paper. This seven point scale consists of 2 items and has the following Cronbach's alpha score α=0,87 . Although none of the hypotheses directly use this measure, it is added to the questionnaire as a control factor for comparison of perceived expertise differences between standard and co-created products.

Willingness To Pay Scale

Chen et al. (1998) measure Willingness to Pay, using two different measurements in one survey. The first measure is the Juster scale, which indicates several price ranges. Respondents are asked to select the maximum amount they would be willing to pay for the product. The second scale starts by providing the average retail price of the product to the respondents, where after respondents rate the probability of purchasing the product on a 7-point Liker scale. This technique brings many possibilities, as it enables a comparison between the retail price and the maximum amount consumers are willing to pay for the product. For this research this measurement scale is used as an additional analysis.

Previous Co-Creation Experience Scale

In the absence of a pre-existing scale, Previous Co-Creation Experience Scale is a self-constructed scale, consisting of one single item. Respondents were directly asked if they had ever participated in co-creation. In order to increase the knowledge of what co-creation actually is, before this question they were given a description and shown a short movie of a co-creation example of Heineken. Respondents could choose between three specific co-creation platforms, provide their own innovation platform where they had participated on, select that they had not participated, or chose the option, "I don't know, I cannot recall". The latter group is added to the non-participants, to ensure that the co-creation participants were truly co-creators.

Statistical Methods

This section of the paper will discuss the steps taken and the statistical methods that were used to test the hypotheses.

Incomplete Surveys

Where 120 respondents were necessary for a cell loading of 30 per product type, 245 attempts were made to complete the survey on Qualtrics. As in any survey, there were some respondents who only answered a few questions and decided to leave the survey process before the end. The 'force response' option of Qualtrics has led to 124 complete responses. The survey completion percentage of 50,61% which looks rather low, due to 110 respondents that clicked on the link, but had not answered any question. A total of 11 people (4,49%) dropped out halfway the survey. Figure 13 gives an overview of the Qualtrics summary for the survey completion.

The very first step was to delete the incomplete surveys, as the answers were not considered trustworthy, given the fact that a lack of interest led to dropping out from the survey. Mostly the answers to these surveys were given randomly. For example, one of the respondents answered 1-7-1-7-1-7…and left the survey hereafter. A total of 11 responses were deleted, as they dropped out at an early stage in the questionnaire.
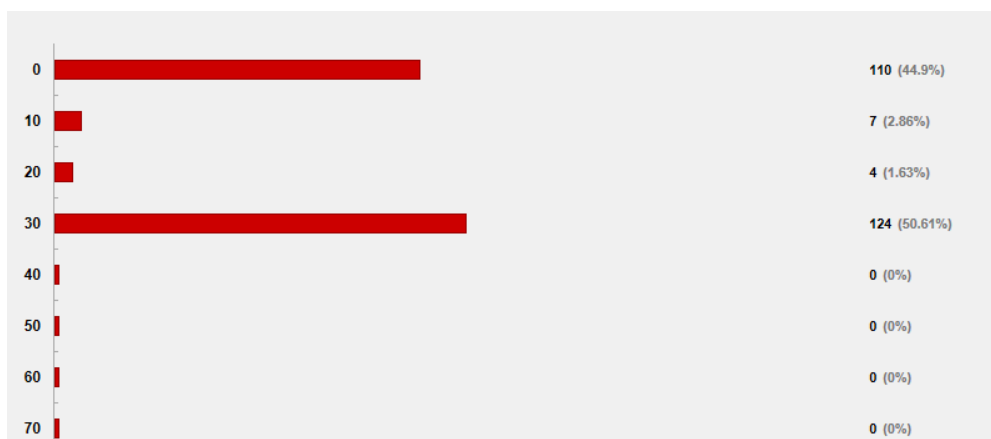
Figure 13. Survey Completion Percentage

*Due to the randomizer which redirected respondents to one of the 4 sets of questions, a full response is measured when completion is at 30%.

Reliability and Validity

Since the survey is based on preexistent multi-item scales, the questionnaire should be tested on reliability and validity.

Here, first reliability is tested using Cronbach's alpha, α. Since multi-item scales are used, one would expect that the answers across the items are consistent. If this is not the case, the multi-item scale is not considered reliable, as it is not reflecting the construct that it should be measuring. The outcome of the SPSS output shows the value of the Cronbach alpha score per construct, and the alpha score of Cronbach when an item of the construct would be deleted. A construct is considered relatively reliable when α>0,6. However, a fair reliability is reached when α≥0,8. So a tradeoff should be made between the number of items and the reliability based on Cronbach's alpha score. Furthermore, validity should be kept in mind as well, when making the decision to delete or keep items, since, as Field (2005) stresses, Cronbach's alpha should not be used as a measure of 'unidimensionality'.

Validity implies studying the underlying dimensions of the constructs in the questionnaire. Principal axis factoring is used to see if the constructs load on the same factor. The Kaiser-Meyer-Olkin measure of sampling (KMO) is calculated and Barlett's test of sphericity. KMO gives an indication of the correlation of the variables and should be at a bare minimum of 0,5 to be considered valid. However, the higher the score the better the validity. SPSS calculates the overall value of KMO and the partial values per construct, which should load well per factor (Field, 2005). Barlett's test here should be significant (<0,05) for the correlation matrix to be an identity matrix (Field, 2005).

Validity and reliability should be reached, by possibly eliminating items from constructs, using trial and error in order to reach the best possible outcomes for Cronbach's alpha and KMO, given the significance of Barlett's test.

Statistical Testing

The purpose of this research is to compare product assessment of two categories of products, co-created and standard, and the differences in product assessment between co-creators and non-co-creators. Statistical testing can be either parametric or non-parametric. When using parametric tests, one assumes that the population is normally distributed (Field, 2005). This requires that the sample data are normally distributed, the observations are independent,

homogeneity of the variance holds, and the test measures at the interval level (Field, 2005). However, as Moore et al. (2003) explain, the central limit theorem suggests that the sample does not necessarily need to be normally distributed. According to the central limit theorem, taking multiple random samples will always lead to a normal distribution, even when the population is not normally distributed, as long as the sample size is appropriate ($N>30$). Given the current sample size, this assumption allows for the use of parametric tests in the case of non-normality (Moore et al, 2003).

To answer the hypotheses, consistently there are two groups being compared, namely the categories of the Design Paradigm (standard and co-created products). The categories of the Design Paradigm can be assigned to the 4 different brands. To investigate the effects of Brand and Design Paradigm on a dependent variable simultaneously, without risking a familywise error, factorial ANOVA is used. The Two-way ANOVA allows for detection of main effects as well as interaction effects on the dependent variables of the hypothesis. However, ANOVA tests only indicate if there is a significant difference, not where the difference is located. For this, in the case of a significant result, either *post hoc* tests, MANOVA, or planned contrasts, are consulted. Before using the ANOVA the assumptions must be met. Given the central limit theorem, the assumption for normality will not be controlled, however Levene's test is used systematically to ensure the homogeneity of variances. The only exception where the factorial ANOVA is not used, is hypothesis 2. Hypothesis 2 does not have independent samples, but rather uses a repeated measure. For this, hypothesis 2 makes use of the paired sample t-test.

Field (2005) explains that using independent samples, given a satisfying sample size will eliminate differences between the sample and the population as a whole. However, to ensure that no differences between the sample and the population exist with regards to Brand Attitude, the independent sample t-test is applied to warrant for deviations in Brand Attitude between the categories of the Design Paradigm. For Task Involvement, the same is done using the Two-way ANOVA. The details of this strategy will be discussed in the first section of the Results chapter. Some additional tests are done as well, which will be deliberated after the results of the hypotheses have been explained. First, the exact methodology per hypothesis will be discussed hereafter.

Hypothesis 1.

Consumers have more trust in advice and recommendations when these concern designer-driven products, than they have in advice and recommendations, provided by co-creators, concerning user-driven products.

In essence hypothesis 1 states;

$$\text{Trust}_{\text{Standard}} > \text{Trust}_{\text{Co-Created}}$$

This hypothesis is examined in the survey trough the Trust in Word of Mouth Recommendations scale of Gilly et al. (1998). Respondents were randomly assigned to one of the in total 8 products. The products belonged to 4 brands. Each brand consisted of two variants, namely a standard version and a co-created version. Respondents were shown a picture of the product, followed by a recommendation, were after they would rate the scale measuring their trust level.

After counterbalancing 2 of the 5 items of the Trust in Word of Mouth scale of Gilly et al. (1998), to fit the rest of the items, the mean of the items is calculated, representing the dependent variable Trust.

A dummy variable was created for the associated design paradigms, were the code 0 was assigned to standard products, and co-created products were coded 1.
As mentioned previously, 4 brands were examined. To calculate the effect of the brand an additional dummy variable is created. Were 1=Lays, 2=Crisp, 3=Dell, and 4=Chip. This dummy variable is added as an independent variable, together with the Design Paradigm predictor, to investigate the effects on the dependent variable Trust. As each respondent was exposed to 2 products and 2 independent categorical variables, Design Paradigm and Brand, are used to detect the effect on the dependent variable Trust, the Two-way mixed ANOVA is appropriate.

Hypothesis 2.

After interaction with co-creators within their social network, consumers are more likely to believe that crowdsourced products will fulfill their needs.

Hypothesis 2 states that consumers are more likely to be satisfied with a co-created product after they are consulted by recommendation from someone in their social network. To test this hypothesis the mean of the Purchase Likelihood scale of Schreier et al. (2012) is evaluated. Respondents were asked to rate this Purchase Likelihood scale, then were shown a text saying; "A very close friend of you tells you the following about….", followed by a recommendation for the product they were evaluating. After this they had to evaluated the Purchase Likelihood scale again. For this, there is a repeated measure of Purchase Likelihood at two points in time, before the recommendation (BR) and after the recommendation (AR). For the hypothesis to hold, for the co-created products, the following equation must be significant;

$$\text{Purchase Likelihood }_{BR} < \text{Purchase Likelihood }_{AR}$$

Since there are pairs of data from the same respondents at another point in time on two levels (Before Recommendation and After Recommendation), the paired samples t-test will be used to draw conclusions about this hypothesis.

Although the hypothesis does not differentiate between standard products and co-created products and their differences in the effect on Purchase Likelihood, it would be interesting to analyze these in addition. For this, the Purchase Likelihood After Recommendation will be evaluated using the factorial ANOVA. The dependent variable in this test will be Purchase Likelihood. The independent variables are Design Paradigm (0=Standard; 1=Co-Created) and Brand (1=Lay's; 2=Crisp; 3=Dell; 4=Chip). Since the sample sizes meet the conditions ($N>30$), the central limit theorem suggests that normality does not have to be evaluated. However the assumption for the homogeneity of variances will be weighted using Levene's test.

Hypothesis 3
Consumers believe crowdsourcing brings a lower quality product than products that are the result of the traditional supply chain..

Actually, what hypothesis 3 states is;

$$\textbf{Quality }_{\textbf{standard}} > \textbf{Quality }_{\textbf{Co-Created}}$$

For this hypothesis the Perceived Performance Risk scale of Mieres et al. (2006) is used (also referred to as Quality Risk scale). Since quality risk is the exact opposite of quality perception, the hypothesis will hold if;

$$\textbf{Quality Risk }_{\textbf{Standard}} < \textbf{Quality Risk }_{\textbf{Co-Created}}$$

Respondents were randomly assigned to one of the in total 8 products. The products belonged to 4 brands. Each brand consisted of two variants, namely a standard version and a co-created version. Respondents were shown a picture of the product, where after they would rate the scale measuring their quality risk perception.

A dummy variable was created for the associated design paradigms, were the code 0 was assigned to standard products, and co-created products were coded 1.
To calculate the effect of the brand an additional dummy variable for Brand was created. Were 1=Lays, 2=Crisp, 3=Dell, and 4=Chip. This dummy variable is added as an independent variable, together with the Design Paradigm predictor, to investigate the effects on the dependent variable Quality Risk. Since 2 independent categorical variables, Design Paradigm and Brand, are used to detect the effect on the dependent variable Trust, the Two-way mixed ANOVA is appropriate.

Hypothesis 4
Consumers in general perceive a higher expected risk when the product is the result of crowdsourcing.

Hypothesis 4 states that ;

$$\textbf{Overall Risk }_{\textbf{standard}} < \textbf{Overall Risk }_{\textbf{Co-Created}}$$

As explained previously, Stone and Grönhaug (1993) proved that their Overall Risk scale captures the essence (88,9%) of the extended risk perception methods introduced by Jacoby and Kaplan (1972). Based on the research of Stone and Grönhaug (1993), the dependent variable for this hypothesis is the mean of their Overall Perceived Risk scale.

The same survey method applies as with the previous hypotheses, where respondents were randomly assigned to one of the 8 products, which belonged to 4 brands. Each brand, again, consisted of two variants, a standard version and a co-created version. Respondents were asked to rate their overall risk perception for the purchase situation they were presented to.

To examine the differences between standard products and co-created products, again, Design Paradigm is introduced as an independent dummy variable (0=Standard; 1=Co-Created). Furthermore, the independent variable Brand is added to see if there are any differences between brands. For this a dummy variable is created, Brand, where 1=Lay's, 2=Crisp, 3=Dell and 4=Chip.

Since 2 independent categorical variables, Design Paradigm and Brand, are measured against the dependent variable, Overall Risk, the Two-way mixed ANOVA is the appropriate test. Given the central limit theorem, the normality assumption of this test is not examined. However, before use of this scale, the assumption of equal variances will be tested.

If the main effect of Design Paradigm on Overall Risk is significantly higher for co-created products than for standard products, the hypothesis can be accepted.

Hypothesis 5

Consumers who have participated in the crowdsourcing process perceive lower risk in the purchase of the user-driven product than consumers who have not participated in the co-creation process.

Hypothesis 5, like hypothesis 4, makes use of the Overall Perceived Risk scale of Stone and Grönhaug (1993). In addition to hypothesis 4, this hypothesis differentiates between respondents' previous participation in co-creation activities, since the hypothesis states that respondents who have participated in co-creation previously are more likely to experience less risk in the purchase of a designer driven product. Basically, what hypothesis 5 states is the following;

$$\text{Overall Risk}_{\text{Previous Participant}} < \text{Overall Risk}_{\text{Non-Participant}}$$

However, hypothesis 5 only claims that this is true for co-created products, not for products in general.

To examine this effect, a factorial ANOVA is used, where the dependent variable is Overall Risk, and the independent variables are Design Paradigm (0=Standard; 1=Co-Created) and Previous Participation (0=Non-Participant; 1=Previous Participation). To answer the hypothesis, the interaction effect between the two independent variables on the dependent variable are particularly important. Given the central limit theorem, the normality assumption of the ANOVA test is respected. However, the homogeneity of variance is predominantly important, as the sample sizes are very different for the independent variable Previous Participation ($N_{Non-Participant}$=208; $N_{Previous\ Participant}$=51).

Hypothesis 6
Consumers are more likely to purchase user-driven products of low product importance, than user-driven products of high product importance.

The dependent variable that will be examined in hypothesis 6 is Purchase Likelihood. Purchase Likelihood is measured using the mean of the Purchase Likelihood scale of Schreier et al. (2012). Respondents were asked to evaluate this scale for the product/brand they were randomly assigned to. The hypothesis claims that, for co-created products;

$$\text{Purchase Likelihood}_{Low\ Involvement} > \text{Purchase Likelihood}_{High\ Involvement}$$

The independent variables used to test this hypothesis are Involvement (0=Low Involvement; 1=High Involvement) and Design Paradigm (0=Standard; 1=Co-Created). Involvement is the sum of the low involvement products of chips, Crisp and Lay's, where high involvement is the total of laptops, Dell and Chip. Particular interest lies in the interaction effect of Design Paradigm and Involvement on Purchase Likelihood. To answer this hypothesis, a mixed model Two-way ANOVA will be done. Given the central limit theorem, the assumption of normality will not be evaluated. However, Levene's test will be used to control for the homogeneity of variances across the sample. In the case of significant outcomes, additional analysis will follow to evaluate the direction of the effects.

The perceived risk of consumers is lower when the co-created product is offered by a known brand (designer-driven brand that has adopted user-driven activities), as compared to the unknown brand (purely user-driven firm).

Hypothesis 7 makes use of an independent variable that has not been tested previously, namely Firm. A dummy variable is created for this variable representing Unknown Firm(0) and Known Firm (1). Unknown firms are the non-existent brands in the survey, Crisp and Chip, whereas Known Firm is the sum of Lay's and Dell. The hypothesis states that for the category Co-Created, of the independent variable Design Paradigm, the mean of Overall Risk, measured using the scale of Stone and Grönhaug (1993), is higher for Unknown Firms than for Known Firms.

$$\text{Overall Risk}_{\text{Unknown}} > \text{Overall Risk}_{\text{Known}}$$

For the hypothesis to be true, a significant difference of the above should hold given the Design Paradigm of Co-Created. To test this an Two-way ANOVA will be conducted, with Overall Risk as the dependent variable and Design Paradigm and Firm Type as the independent variables. Again, given the central limit theorem, normality will not be checked, however Levene's test must non-significant to allow for the use of the ANOVA test, with respect to the homogeneity of variances assumption. If the interaction effect of Design Paradigm and Firm Type on Overall Risk is significant, within subject effects will be evaluated to confirm the direction of the effects.

Results

This section of the paper will present the results of the tests as explained in the previous methodology section. These results will lead to either adoption or rejection of the hypotheses. First some general information will be provided, followed by the results per hypothesis.

Demographics

A total of 124 respondents took the time to provide their age and gender at the last section of the survey. The questionnaire was fulfilled by 75 male (60,5%) and 49 female (39,5%) respondents. Where the mean age of the respondents is 32,53 years (median 28), the spread is between 18 and 67. This might be considered relatively low when compared to the population as a whole, especially when the sample age distribution displayed in Figure 14 is considered. Reason for this lies in the sampling method. Since most of the completed surveys were personal contact that were asked to participate trough Facebook, the average age resembles the average age of the personal relations and relative age of participation on Facebook.
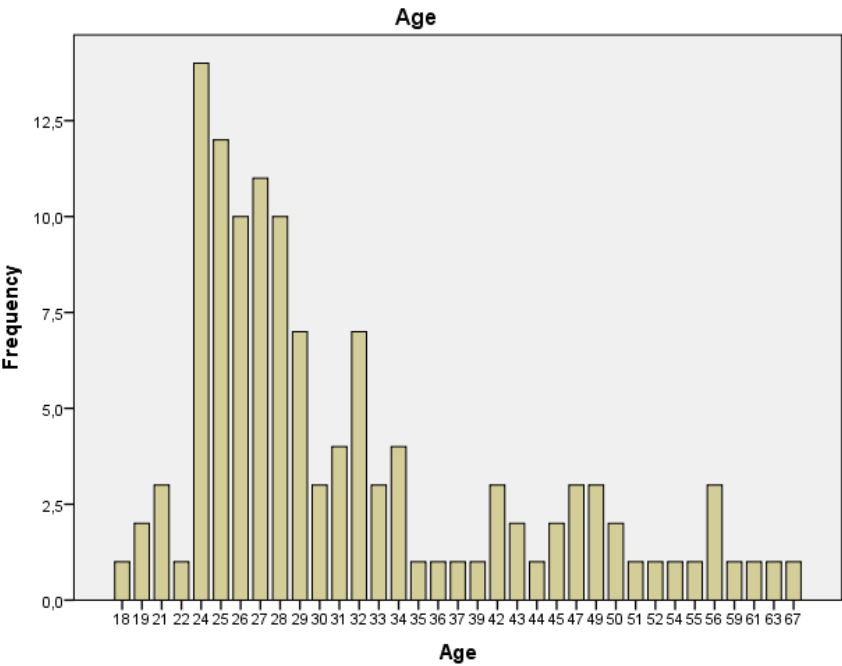
Figure 14. Age Distribution Sample

Validity And Reliability

As explained in the methodology section of this paper, the survey consisted of preexistent multi-item scales, these scales should be tested for reliability and validity before any calculations for the hypotheses can be made. Appendix 1 displays the summary table of the reliability and validity scores and the conclusions based on these outcomes for all constructs. Figure 15 shows part of this table, namely the constructs with deleted items or unused scales.

Question	Subject	Alpha Score	KMO	Items Deleted
Q3.8 & Q3.9	Design Expertise Lay's Standard	0,857	0,5	Low Validity
Q3.10	Perceived Risk Lay's Standard	0,903	0,658	3.10.1
Q3.20	Trust in WOM recommendation Lay's Standard	0,837	0,658	3.20.1
Q3.25 & Q3.26	Design Expertise Chip Co-Created	0,89	0,5	Low Validity
Q3.27	Perceived Risk Chip Co-Created	0,941	0,778	3.27.1
Q3.37	Trust in WOM recommendation Chip Co-Created	0,839	0,778	3.37.1 & 3.37.3
Q4.2 & 4.3	Design Expertise Chip Standard	0,719	0,5	Low Validity
Q4.4	Perceived Risk Chip Standard	0,665	0,791	4.4.2
Q4.14	Trust in WOM recommendation Chip Standard	0,883	0,791	4.14.1
Q4.37	Trust in WOM recommendation Lay's Co-Created	0,83	0,669	4.37.1 & 4.37.2
Q5.8 & Q5.9	Design Expertise Dell Standard	0,832	0,5	Low Validity
Q5.20	Trust in WOM recommendation Dell Standard	0,862	0,655	5.20.1
Q5.25 & Q5.26	Design Expertise Crisp Co-Created	0,927	0,5	Low Validity
Q5.37	Trust in WOM recommendation Crisp co-created	0,873	0,622	5.37.1 & 5.37.5
Q6.2 & Q6.3	Design Expertise Crisp Standard	0,865	0,5	Low Validity
Q6.14	Trust in WOM recommendation Crisp Standard	0,804	0,778	6.14.1 & 6.14.3 &6.14.4
Q6.25 & Q6.26	Design Expertise Dell Co-Created	0,87	0,5	Low Validity

Figure 15. Summary Table Reliability And Validity Outcomes. See Appendix 1 for complete overview.

As can be seen in the table of Figure 15 the scale 'Design Expertise', proves to have low validity, although the reliability is appropriate. Design Expertise was originally added in the survey in order to complement the scales mentioned in the methodology section. Based on the validity and the reliability tests, the decision has been made to withdraw this scale from any further analysis.

For some constructs of 'Overall Perceived Risk' and 'Trust in WOM Recommendations', several items were deleted from the analysis based on the reliability and validity outcomes. All tests followed took place using the outcome of the reliability and validity tests.

Brand Likeability

To rule out any possible influence of the brands selected in the survey, the scale Brand Likeability of Spears and Singh (2012) was examined. Although Field (2005) explains that independent samples of a sufficient sample size will represent the population as a whole with some degree of certainty, and differences between the samples are eliminated, the respondents of the pilot test showed their concern. As the feedback of the pilot test pointed out, respondents might have very strong feeling in favor or against a brand, which might influence the responses to the other scales (for example Purchase Likeability). For this reason all the sets involving either Dell or Lay's first measured Brand Likeability, which was tested across the groups to indicate if differences between the groups of 'Standard' and 'Co-Created' existed. For Chip and Crisp the Brand Likeability is not measured, as these are non-existing brands. Since one dependent variable, Brand Likeability, is tested, using Design Paradigm (0=Standard; 1=Co-Created), which contains two levels, as the independent variable, the independent samples t-test would be the appropriate test to do. A total of two independent samples t-test have been conducted, one evaluating the differences for Lay's across Standard and Co-Created Design Paradigms and one measuring the same for Dell. All outcomes are based on the 5% significance level, $p \geq 0,05$. See Appendix 2 for the SPSS output for Brand Likeability.

➢ The independent sample t-test for Dell showed no significant difference, $t(64) = 1,64$, $p=0,11$ (two-tailed), between the group 'Standard' ($M = 4,51$, $SD = 0,93$) and the group 'Co-Created'($M = 4,14$, $SD = 0,90$). The magnitude of the difference in means was 0,37 with a 95% confidence interval of -0,08 to 0,82.

➢ The independent sample t-test for Lay's showed no significant difference either, $t(65) = 1,14$, $p=0,26$ (two-tailed), between the group 'Standard' ($M = 5,18$, $SD = 0,83$) and the group 'Co-Created'($M = 4,87$, $SD = 1,35$). The magnitude of the difference in means was 0,31 with a 95% confidence interval of -0,23 to 0,85.

From this, one can conclude, that differences in Brand Likeability across the samples do not (significantly) influence any further analysis based on this set of respondents.

Task Involvement

The extent to which one can relate to a purchase situation is measured using the Task Involvement scale of Smith et al. (2005), also referred to as Purchase Involvement. As for Brand Likeability, the respondents of the pilot test indicated that they were influenced by their Purchase Involvement when answering the survey. Although sufficient sample sizes, with some degree of certainty, rule out differences between groups and between the sample and the population as a whole (Field, 2005), attention will be given to these concerns. To ensure that variance in Task Involvement level across samples do not influence the understanding of the possible effects caused by the Design Paradigm, further analysis of this variable will be done.

Task Involvement has been measured per product type (Laptop and Chips) at the beginning of the survey, before respondents were directed to a specific set of questions by the randomization. See Figure 16 for the measurement overview.

	Task Inv CHIPS	Task Inv Laptop	Lays Standard	Lays Co-Created	Crisp Standard	Crisp Co-Created	Dell Standard	Dell Co-Created	Chip Standard	Chip Co-Created
Set 1	Mean	Mean	X							X
Set 2	Mean	Mean		X					X	
Set 3	Mean	Mean				X	X			
Set 4	Mean	Mean			X			X		

Figure 16. Task Involvement Survey Measurement Overview

As Figure 16 shows, respondents that were directed to Set 1, were questioned on Lay's Standard and Chip Co-Created. Respondents that were randomized to Set 2, were examined for Lay's Co-Created and Chip Standard, and so on.

The purpose of this test, is to detect any possible differences between the two Design Paradigms of a brand. To detect differences on Task Involvement between the sample of Lay's Standard and Lay's Co-Created, the mean of the Task Involvement scale for Chips must be compared for respondents of Set 1 and Set 2. For Chip the same sets are examined, but now for Task Involvement of Laptops. The differences in Task Involvement for Crisp are examined by comparing the mean values for Task Involvement of Chips of Set 3(Crisp Co-Created) to that of set 4 (Crisp Standard).

Since Design Paradigm is measured by independent samples, an independent sample t-test is conducted for each of the 4 brands. The SPSS output of these tests can be found in Appendix 2. For all tests done in this paper a significance level of 5% (p=0,05) is maintained.

- The independent sample t-test for Lay's showed not to be significant , $t(63) = 1,80$, p=0,08 (two-tailed), between the group 'Standard' ($M = 3,66$, $SD = 1,39$) and the group 'Co-Created'($M = 3,09$, $SD = 1,13$). The magnitude of the difference in means was 0,57 with a 95% confidence interval of -0,06 to 1,20

- The independent sample t-test for Crisp showed not to be significant, $t(60) = 0,49$, p=0,63 (two-tailed), between the group 'Standard' ($M = 3,60$, $SD = 1,41$) and the group 'Co-Created'($M = 3,78$, $SD = 1,39$). The magnitude of the difference in means was 0,17 with a 95% confidence interval of -0,89 to 0,54.

- The independent sample t-test for Dell showed not to be significant either, however here equal variances are not assumed, $t(61) = 1,37$, p=0,18 (two-tailed), between the group 'Standard' ($M = 5,29$, $SD = 1,32$) and the group 'Co-Created'($M = 5,67$, $SD = 0,80$). The magnitude of the difference in means was 0,38 with a 95% confidence interval of -0,93 to 0,18.

- In line with the other brands, the independent sample t-test for Chip showed not to be significant as well, $t(63) = 1,64$, p=0,11 (two-tailed), between the group 'Standard' ($M = 5,38$, $SD = 1,20$) and the group 'Co-Created'($M = 5,81$, $SD = 0,88$). The magnitude of the difference in means was 0,43 with a 95% confidence interval of -0,95 to 0,09.

Based on the analysis of Task Involvement, one can conclude that Task Involvement does not significantly differ between the samples of the Standard Design Paradigm and the samples of the Co-Created Design Paradigm, for any given brand, and thus there will be no bias due to the variance in Task Involvement in further calculations for hypothesis testing.

Descriptive Table

Figure 17a and 17b, provide an overview of the descriptive statistics that help answer the hypotheses. The table gives an overview per construct, containing the number of respondents (*N*), the mean scores (*M*), and the standard deviation (*SD*).

	Trust		Need Perception		Purchase Likelihood	
	N	Mean/SD	N	Mean/SD	N	Mean/SD
Lay's Standard	33	4,44/1,10				
Lay's Co-Created	31	3,94/1,15				
Lay's Co-Created BR					31	3,98/1,53
Lay's Co-Created AR			31	4,53/1,40	31	4,20/1,75
Dell Standard	31	3,91/1,22				
Dell Co-Created	30	3,54/1,05				
Dell Co-Created BR					31	2,96/1,51
Dell Co-Created AR			31	3,78/1,43	31	3,38/1,70
Chip Standard	32	4,09/1,22				
Chip Co-Created	30	3,90/1,14				
Chip Co-Created BR					32	3,08/1,65
Chip Co-Created AR			32	3,93/1,60	32	3,68/1,65
Crisp Standard	29	4,57/1,05				
Crisp Co-Created	30	4,49/1,15				
Crisp Co-Created BR					30	3,95/1,58
Crisp Co-Created AR			30	4,79/1,29	30	4,52/1,60
Chips/Low Involvement St.						
Chips/Low Involvement CC					61	3,96/1,54
Chips/LI BR			61	4,43/1,53	61	3,96/1,54
Chips/LI AR			61	4,66/1,34	61	4,36/1,67
Laptops/High Involvement St.						
Laptops/High Involvement CC					63	3,02/1,57
Laptops/HI BR			63	4,40/1.57	63	3,02/1,57
Laptops/HI AR			63	3,86/1,51	63	3,53/1,67
All Standard	131	4,34/1,24				
All Co-Created	124	4,03/1,22				
All Co-Created BR			124	4,58/1,39	124	3,48/1,62
ALL Co-Created AR			124	4,25/1,48	124	3,94/1,71

Figure 17a. Descriptive Table.

	Quality Risk Perception		Perceived Overall Risk		Financial Risk	
	N	Mean/SD	N	Mean/SD	N	Mean/SD
Lay's Standard	34	3,49/1,26	34	2,60/1,39	34	3,75/1,50
Lay's Co-Created	31	3,18/1,38	31	2,63/1,20	31	3,41/1,71
Dell Standard	32	3,52/1,36	32	3,43/1,21	32	3,83/1,38
Dell Co-Created	31	3,53/1,50	31	3,53/1,68	31	3,84/1,52
Chip Standard	35	4,24/1,25	35	3,84/1,25	35	4,04/1,39
Chip Co-Created	32	4,86/1,33	33	4,05/1,65	33	4,47/1,40
Crisp Standard	34	3,43/1,28	34	2,68/1,34	34	3,48/1,39
Crisp Co-Created	30	3,35/1,36	30	2,93/1,28	30	3,41/1,53
Chips/Low Involvement St.	68	3,46/1,26	68	2,64/1,36	68	3,62/1,44
Chips/Low Involvement CC	61	3,26/1,36	61	2,78/1,24	61	3,41/1,61
Laptops/High Involvement St.	67	3,89/1,34	67	3,64/1,24	67	3,94/1,38
Laptops/High Involvement CC	63	4,21/1,56	64	3,79/1,67	64	4,16/1,48
Known Brand High Inv.	31	3,53/1,50	31	3,53/1,68	31	3,84/1,52
Unknown Brand High Involv.	32	4,86/1,33	33	4,05/1,65	32	4,47/1,40
Known Brand Low Involv.	31	3,18/1,38	31	2,63/1,20	31	3,41/1,71
Unknown Brand Low Involv.	30	3,35/1,36	30	2,93/1,28	30	3,41/1,53
All Standard	135	3,67/1,32	135	3,14/1,39	135	3,78/1,41
All Co-Created	124	3,74/1,54	125	3,30/1,56	125	3,79/1,58
All Known Brand	62	3,35/1,44	62	3,08/1,52	62	3,62/1,62
All Unknown Brand	62	4,13/1,54	63	3,52/1,58	62	3,96/1,54
Non-Participant Co-Creation	99	3,89/1,55	100	3,43/1,60	100	3,96/1,61
Participant Co-Creation	25	3,16/1,37	25	2,80/1,32	25	3,15/1,32

Figure 17b. Descriptive Table.

The table provides not only the 4 brands in terms of standard and co-created descriptive statistics, but also combines involvement levels, brand recognition, and possible participation in previous co-creation activities, as all these variables are necessary for answering the hypotheses. Next the results of the statistical tests will be discussed per hypothesis, based on the relevant descriptive statistics from Figure 17.

Results Per Hypothesis

So far, the overall general results are provided, in terms of reliability, validity, sample control variables and the descriptive table. The next section will present the result per hypothesis.

Hypothesis 1

As mentioned in the methodology section of this paper, a factorial ANOVA test has been done, with 2 independent variables, both categorical. The first independent variable is Design Paradigm (0=Standard; 1=Co-Created). The main effect of this independent variable is essential for answering the hypothesis. The second effect that is investigated is Brand (1=Lay's; 2=Crisp; 3=Dell; 4=Chip). Examining the variable Brand will detect differences between the brand on the independent variable trust. Since the first independent variable, Design Paradigm, is hypothesized, a planned contrast will be done to investigate the effect. For the independent variable Brand, a *post hoc* test will be done, since no *a priori* predictions are made. For the *post hoc* test, Gabriel's test will be done, due to its robustness in situations with unequal sample sizes. Since ANOVA is a parametric test, the assumptions of normality and homogeneity of variances should be controlled. Given the central limit theorem, normality is not tested. The assumption of homogeneity of variances is checked using Levene's test for homogeneity of variances. Since this test is not significant, 0,975 (>0,05), the null hypothesis that the variances do significantly differ is rejected. This allows for the use of the factorial ANOVA test results, since the assumption of homogeneity is met. Appendix 3 provides the SPSS output of the tests. The main ANOVA table, is displayed in Figure 18.

Tests of Between-Subjects Effects

Dependent Variable: Trust_Total

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	31,368[a]	7	4,481	3,105	,004
Intercept	4463,324	1	4463,324	3092,935	,000
Design	5,736	1	5,736	3,975	**,047**
Brand	23,459	3	7,820	5,419	**,001**
Design * Brand	1,927	3	,642	,445	**,721**
Error	356,438	247	1,443		
Total	4863,774	255			
Corrected Total	387,807	254			

a. R Squared = ,081 (Adjusted R Squared = ,055)

Figure 18. SPSS Output Test of Between-Subjects Effects H1.

Figure 18 shows the effect of the independent variables on the dependent variable. The F-value of the variable Design Paradigm has a significant effect on the independent variable Trust ($p<0,05$), indicating that there is a difference between standard products and co-created products in terms of trust, which will be elaborated on further in this analysis. The main effect of the independent variable Brand shows to have a significant F-value as well ($p<0,05$), indicating that overall, isolating the Design Paradigm, Trust is effected by the differences between brands. However, the test does not tell how the results differ, for this the *post hoc* tests and the contrast will be elaborated on. The SPSS output of Figure 18 also includes the interaction effect between Band and Design Paradigm. This effect does not have a significant F-value ($p>0,05$), meaning that the brands and the design paradigm of the products do not interact, for example the difference between standard and co-created products do not significantly vary between the brand Lay's and the brand Crisp.

First Figure 19 will be discussed. Figure 19 displays the bar chart of the dependent variable and the independent variables.
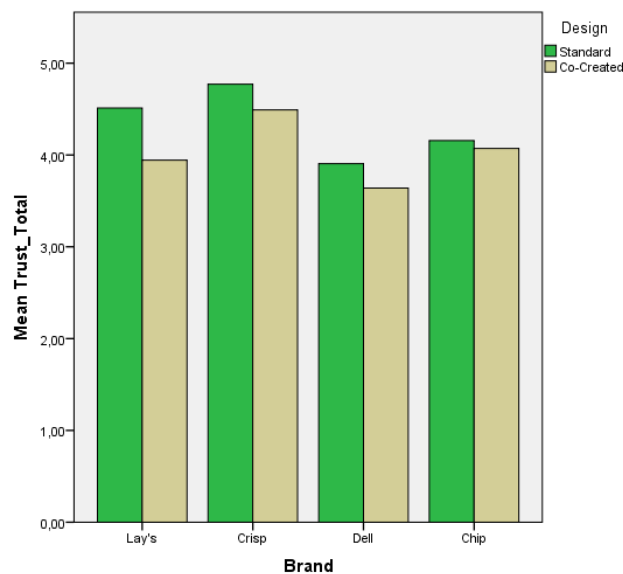
Figure 19. Bar Chart Hypothesis 1.

The ANOVA test indicated a significant difference in the F-value of the independent variable Design Paradigm. The bar chart of Figure 19 clearly displays the difference between standard and co-created products. For all 4 brands standard products have a smaller mean of trust than co-created products, which is in line with the hypothesis. This difference is verified by the Helmert contrast that can be found in Appendix 3.

The independent variable Brand showed to have a significant F-value as well ($P<0,05$). This indicates differences between the brands. Further analysis is done to investigate where these differences exist by use of Gabriel's *post hoc* test. First Figure 20, which contains the error bars of the brands, will be discussed.
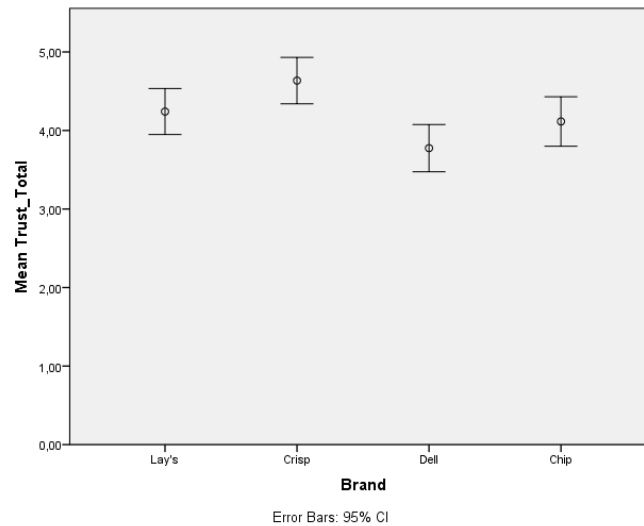
Figure 20. Error bar chart hypothesis 1.

As can be seen in Figure 20, there is little difference between the position of the error bar charts on the Mean of Trust scale, except for the brand Crisp and the brand Dell. This would indicate that the significant effect in the SPSS output of Figure 18 is due to the difference between the brands Crisp and Dell. The *post hoc* test of Gabriel, which can be found in Appendix 3, is in line with this statement. The brands Crisp and Dell are the only brands that have a significant difference in the *post hoc* test of Gabriel.

To summarize, a total of 2 independent variables, Brand and Design Paradigm, and the associated interaction, were examined for their effects on the dependent variable Trust.

Hypothesis 1 would hold, if the main effect of Design Paradigm on Trust would significantly differ between the categories Standard and Co-Created. The Two-way ANOVA test, indeed, showed that there is a significant main effect of the Design Paradigm on Trust, $F(1,247)=3,98$, $p<0,05$, where the category Standard ($M=4,34$, $SD=1,24$) is higher than the category Co-Created ($M=4,03$, $SD=1,22$), as hypothesized. For this Hypothesis 1 is accepted.

There also was a significant main effect of Brand on Trust, $F(3,247)=5,42$, $p<0,05$. *The post hoc* test of Gabriel clarified that this effect is solely due to the significant ($p=0,00$) differences between Crisp and Dell.

Furthermore, the interaction between the 2 independent variables were examined, which showed a non-significant interaction effect between Design Paradigm and Brand on the dependent variable Trust, $F(3, 247)=0,45$, $p=0,72$.

Where Gabriel's test only points out significant differences between the brands Crisp and Dell, Figure 19 and Figure 20 both indicate that the brands Dell and Chip (Laptops/High Involvement Products) have a deviating effect on Trust in WOM, as compared to the brands Lay's and Crisp (Chips/Low Involvement Products). An additional Two-way ANOVA is conducted to examines the effect of the independent variables Design Paradigm (0=Standard; 1=Co-Created) and Involvement (0=Low Involvement; 1=High Involvement) on the dependent variable Trust. The results, from which the SPSS Output can be found in Appendix 3, show a significant main effect of Involvement on Trust, $F(1, 251)=14,61$, $p=0,002$. The mean of Trust for Low Involvement products ($M=4,43$, $SD=1,19$) is higher than that of High, indicating that Trust is influenced by the Involvement Level of the product.

Hypothesis 2

As explained in the methodology section, hypothesis 2 will be tested by comparing the Before Recommendation mean of the Purchase Likelihood scale of Schreier et al. (2012) to the After Recommendation mean of this same scale. Comparison will be done using the paired samples t-test, where each pair represents a brand. For the hypothesis to hold, the mean value of the co-created products after the recommendation must be significantly larger than the mean value before the recommendation. In addition to the brands, the total scores for Low Involvement products (chips), High Involvement products (laptops) and the total of all products will be added as pairs in the test as well. However, these will not be used, due to the family wise error rate. The SPSS output for hypothesis 2 can be found in Appendix 4. Figure 21 displays the summary table of the paired sample t-test output from SPSS for the co-created products.

Purchase Likelihood		N	M	SD	df	t	2-tailed p	MD	95% CI	
									Lower	Upper
Lays	BR	31	3,98	1,53	30	-2,04	0,05	-0,23	-0,45	0,00
	AR	31	4,20	1,75						
Crisp	BR	30	3,95	1,58	29	-2,59	0,02	-0,57	-1,01	-0,12
	AR	30	4,52	1,60						
CHIPS	BR	61	3,96	1,54	60	-3,22	0,00	-0,39	-0,64	-0,15
	AR	61	4,36	1,67						
Dell	BR	31	2,96	1,51	30	-2,12	0,04	-0,42	-0,82	-0,02
	AR	31	3,38	1,70						
Chip	BR	32	3,08	1,65	31	-3,35	0,00	-0,60	-0,97	-0,24
	AR	32	3,68	1,65						
LAPTOP	BR	63	3,02	1,57	62	-3,85	0,00	-0,51	-0,78	-0,25
	AR	63	3,53	1,67						
Total	BR	124	3,48	1,62	123	5,03	0,00	-0,45	-0,63	-0,28
	AR	124	3,94	1,71						

Figure 21. Paired Sample T-Test Overview of the H2 Purchase Likelihood Scale.

As Figure 21 shows, all mean values for Purchase Likelihood After Recommendation (AR) are significantly higher (p<0,05) than Before Recommendation (BR).

➤ The paired sample t-test for Lay's before and after recommendation is significant, $t(30) = 2,04$, $p=0,05$ (two-tailed), between the group 'Before Recommendation' ($M = 3,98$, $SD = 1,53$) and the group 'After Recommendation'($M = 4,20$, $SD = 1,75$). The magnitude of the difference in means is −0,23 with a 95% confidence interval of -0,45 to 0,00.

➤ The paired sample t-test for Crisp before and after recommendation is significant, $t(29) = 2,59$, $p=0,02$ (two-tailed), between the group 'Before Recommendation' ($M = 3,95$, $SD = 1,58$) and the group 'After Recommendation'($M = 4,52$, $SD = 1,60$). The magnitude of the difference in means is −0,57 with a 95% confidence interval of -1,01 to -0,12.

➤ The paired sample t-test for Dell before and after recommendation is significant, $t(30) = 2,12$, $p=0,04$ (two-tailed), between the group 'Before Recommendation' ($M = 2,96$, $SD = 1,51$) and the group 'After Recommendation'($M = 3,38$, $SD = 1,70$). The magnitude of the difference in means is −0,42 with a 95% confidence interval of -0,82 to -0,02.

➢ The paired sample t-test for Chip before and after recommendation is significant, $t(31) = 3,35$, $p=0,00$ (two-tailed), between the group 'Before Recommendation' ($M = 3,08$, $SD = 1,65$) and the group 'After Recommendation' ($M = 3,68$, $SD = 1,65$). The magnitude of the difference in means is $-0,60$ with a 95% confidence interval of -0,97 to 0,24

Based on these results, hypothesis 2 holds for all brands, and thus is accepted. However, as the scope of this paper lies in the difference in perceived consumer perception between standard products and co-created products a Two-way ANOVA test is done to detect if the interaction effect of Design Paradigm (0=Standard; 1=Co-Created) and Brand (1=Lay's; 2=Crisp; 3=Dell; 4=Chip) has an influence on Purchase Likeability. The SPSS Output for this test can be found in Appendix 4.

Levene's test for the homogeneity of variances is non-significant at $p=0,812$, justifying the use of this model with respect to the assumptions for parametric tests.

As can be seen in Figure 22, the main effect of Brand, *ceteris paribus*, on Purchase Likeability is significant, $F(3,247)=7,65$, $p=0,00$. This indicated that the categories of the dummy variable Brand (Lay's, Crisp, Dell and Chip) differ in their effect on Purchase Likelihood.

Tests of Between-Subjects Effects

Dependent Variable: PL_AR

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	64,132[a]	7	9,162	3,599	,001
Intercept	3774,537	1	3774,537	1482,733	,000
Brand	58,398	3	19,466	7,647	**,000**
Design	2,267	1	2,267	,890	**,346**
Brand * Design	3,265	3	1,088	,427	**,733**
Error	628,779	247	2,546		
Total	4466,875	255			
Corrected Total	692,910	254			

a. R Squared = ,093 (Adjusted R Squared = ,067)

Figure 22. SPSS Output Test of Between-Subjects Effects Additional Analysis H2.

Further analysis should be done to investigate where these differences exactly are present, however, for this test it is not relevant, as the interest lies in the main effect of Design and the interaction effect of Brand and Design on Purchase Likelihood. The ANOVA test indicates that no significant effect exists between Design Paradigm on Purchase Likelihood. The F-value is not significant at, $F(1,247)=0,89$, $p=0,346$. From this it must be concluded that there are no significant differences between Standard ad Co-Created products in their effect on Purchase Likelihood. The F-value of the interaction effect of Brand and Design on Purchase Likelihood is non-significant as well, at , $F(3,247)=0,427$, $p=0,73$. Based on the outcome of these tests, one has to conclude that there are no significant differences between Standard and Co-Created products in their effect on Purchase Likelihood. Even though, hypothesis 2 is accepted, because the Purchase Likeability of respondents after recommendation is significantly higher than before for co-created products, the ANOVA test explains that these differences are not due to the fact that the products were co-created. As can be seen in the paired sample t-test in Appendix 2, the same effect exists for standard products (AR>BR).

Hypothesis 3

To test this hypothesis, a factorial ANOVA test has been done, with 2 independent variables, both categorical. The first independent variable is Design Paradigm (0=Standard; 1=Co-Created). The main effect of this independent variable is essential for answering the hypothesis. The second effect that is investigated is Brand (1=Lay's; 2=Crisp; 3=Dell; 4=Chip). Examining the variable Brand will detect differences between the brand on the independent variable Quality Risk. The independent variable Design Paradigm is hypothesized, for this the Helmert contrast will be examined. Since no *a priori* expectations exists for the independent variable Brand, a *post hoc* test will be done. Due to unbalanced sample sizes, the *post hoc* test of Gabriel will be used. As mentioned previously, since ANOVA is a parametric test, the assumptions of normality and homogeneity of variances should be controlled. However, considering the central limit theorem, normality is not tested. Levene's test of homogeneity of variances is done to investigate the second assumption mentioned.

Since Levene's test is not significant at 0,899 ($p>0,05$), the ANOVA model is appropriate to use. The SPSS output can be found in Appendix 5. Figure 23 contains the main ANOVA table.

Tests of Between-Subjects Effects

Dependent Variable: Quality

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	71,261[a]	7	10,180	5,669	,000
Intercept	3532,285	1	3532,285	1967,048	,000
Design	,264	1	,264	,147	**,702**
Brand	64,982	3	21,661	12,062	**,000**
Design * Brand	7,826	3	2,609	1,453	**,228**
Error	450,728	251	1,796		
Total	4078,438	259			
Corrected Total	521,989	258			

a. R Squared = ,137 (Adjusted R Squared = ,112)

Figure 23. SPSS Output Test of Between-Subjects Effects H3.

As can be seen in Figure 23, the independent variable Brand has a significant F-value for is effect on the dependent variable Quality Risk ($p<0,05$). The independent variable Design Paradigm and the interaction effect between Brand and Design Paradigm, do not have significant F-values ($p>0,05$). From this, one can conclude that there is no support for the hypothesis, since the main effect of Design Paradigm on Quality Risk does not significantly differ between the categories Standard and Co-Created.

Since the independent variable Brand, does have a significant effect, the *post hoc* test of Gabriel is used to detect how these variables differ, due to unequal sample sizes. Gabriel's test, which can be found in Appendix 3, shows that the brand Chip is the only category that significantly differs from all other brands ($p=0,00$). None of the other brands show significant contrasts.
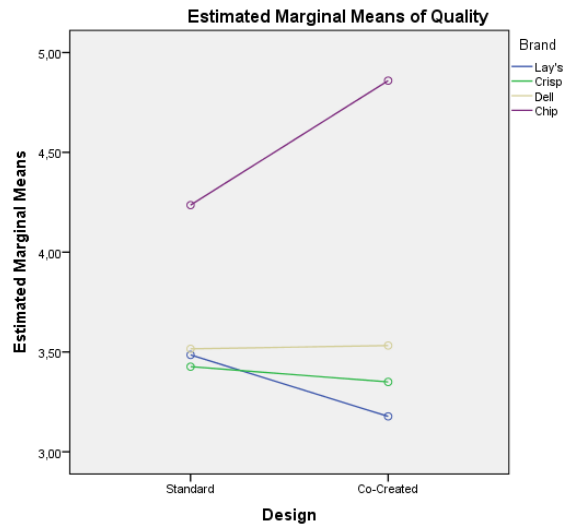
Figure 24. SPSS Output Hypothesis 3; Graph of the Estimated Marginal Means.

In sum, the independent variables Brand and Design and their interaction effect were testes to illustrate if they influence the dependent variable Quality Risk.

For hypothesis 3 to hold the following equation must be true;

Quality Risk $_{Standard}$ < Quality Risk $_{Co\text{-}Created}$

For this equation to hold, the main effect of the independent variable Design Paradigm must have had a significant F-value ($p>0,05$) and a higher mean of the Quality Risk for the category Co-Created, than for the category Standard. However, the main effect of Design Paradigm on Quality Risk is non-significant, $F(1,251)=0,15$, $p=0,70$. For this the hypothesis 3 is rejected.

The interaction effect of Brand and Design Paradigm on Quality Risk are non-significant as well, $F(3,251)=1,45$, $p=0,23$.

However, there was a significant main effect of Brand on Quality Risk, $F(3,251)=12,06$, $p<0,05$. *The post hoc* test of Gabriel clarified that this effect is solely due to the significant ($p=0,00$) deviation of Chip against all other brands ($p=0,00$).

Additional Analysis Hypothesis 3

Figure 24 showed how the brand Chip deviates from all other brands in the test. However, when looking at the bar chart of Figure 25, one will notice that both Dell and Chip, in contrast to Crisp and Lay's, have a higher mean of Quality Risk for Co-Created design, than for Standard design.
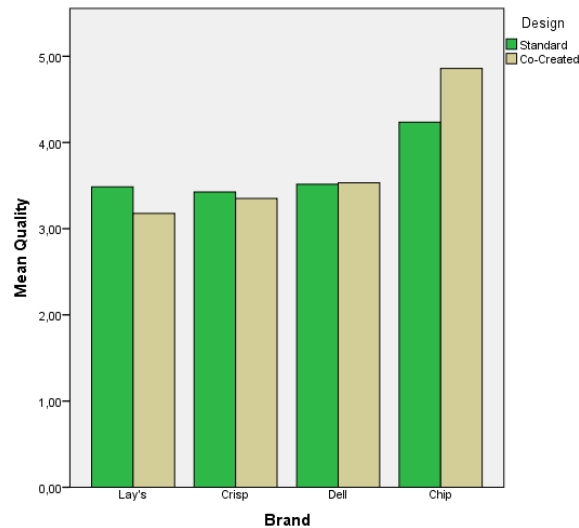
Figure 25. Bar Chart Hypothesis 3.

The product choice of the survey was designed to differentiate between High Involvement, ad Low Involvement brands. Where Low Involvement, chips, is the sum of the results of Lay's and Crisp, and High Involvement, laptops, is the total of Chip and Dell. Since Figure 25 indicates differences between these two involvement levels, it would be interesting to add these to the ANOVA test. However, due to m*ulticollinearity* between the independent variable Brand and the independent variable Involvement, this additional test replaces Brand with Involvement (0=Low Involvement; 1=High Involvement). Appendix 5 contains the SPSS Output of the additional test.

Levene's test for the additional Two-way ANOVA is not significant at 0,269 (>0,05), which allows for the usage of the statistics obtained.

Tests of Between-Subjects Effects

Dependent Variable: Quality

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	34,348[a]	3	11,449	5,987	,001
Intercept	3546,549	1	3546,549	1854,580	,000
Design	,236	1	,236	,124	**,725**
Involvement	30,765	1	30,765	16,088	**,000**
Design * Involvement	4,172	1	4,172	2,181	**,141**
Error	487,641	255	1,912		
Total	4078,438	259			
Corrected Total	521,989	258			

a. R Squared = ,066 (Adjusted R Squared = ,055)

Figure 26. SPSS Output Additional Analysis Hypothesis 3, Test of Between-Subjects Effects.

As in the original analysis of hypothesis 3, the main effect of Design Paradigm on Quality Risk is non-significant, $F(1,255)=0,12$, $p=0,73$. Based on these result, hypothesis 3 is still rejected.

The interaction effect of Involvement and Design Paradigm on Quality Risk are non-significant again as well, $F(1,255)=2,81$, $p=0,14$.

As expected, there was a significant main effect of Involvement on Quality Risk, $F(1,255)=16,96$, $p<0,05$. The Helmert contrast verifies that the Quality Risk for Low Involvement products is lower ($M=3,36$, $SE=0,12$) than that of High Involvement products ($M=4,05$, $SE=0,12$). This effect substantiates previous research of, among which, Dodds et al. (1991).

Hypothesis 4

As explained in the methodology section, a factorial ANOVA will be done to test hypothesis 4. The independent variables for this test are the dummy variables Design Paradigm (0=Standard; 1=Co-Created) and Brand (1=Lay's; 2=Crisp; 3=Dell; 4=Chip). The dependent variable is the mean of the Overall Risk scale of Stone and Grönhaug (1993). Since the main effect of the independent variable Design Paradigm is hypothesized, a contrast will be done to examine in which direction the effects go, if any significant differences are obtained. For this the Helmert contrast is used. The independent variable Brand is not hypothesized, in the case

of significant effects on the dependent variable, convergence between the categories of the variable Brand will be examined by use of a *post hoc* test. Due to unbalanced sample sizes, Gabriel's test will be used, because of its robustness in this situation. The SPSS output for hypothesis 4 can be found in Appendix 6.

Leven's test is not significant at 0,22 (>0,05), for this, with respect to the assumption for homogeneity of variances, the ANOVA model is appropriate to use.

Figure 27, contains the ANOVA table for the between-subject effects.

Tests of Between-Subjects Effects

Dependent Variable: Overall_Risk

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	76,436[a]	7	10,919	5,672	,000
Intercept	2674,060	1	2674,060	1389,007	,000
Design	1,414	1	1,414	,734	,392
Brand	74,227	3	24,742	12,852	,000
Design * Brand	,495	3	,165	,086	,968
Error	485,140	252	1,925		
Total	3250,731	260			
Corrected Total	561,576	259			

a. R Squared = ,136 (Adjusted R Squared = ,112)

Figure 27. SPSS Output Test of Between-Subjects Effects H4.

The ANOVA test shows a significant effect of Brand on Overall Risk, since the F-value is significant at, $F(3,252)=12,85$, $p<0,0,05$. Gabriel's test assigns the categories of Brand in 2 subsets, where subset 1 contains the brands Lay's and Crisp (low involvement products) and subset 2 resembles Dell and Chip (high involvement products). All brands of a subset show significant mean differences when compared to a brand of the other subset. From this one can conclude that there are significant differences in Overall Risk perception between the analyzed brands.

The ANOVA test also captures Design Paradigm, which is the most important effect for answering the hypothesis. As hypothesized, the Design Paradigm shows a lower mean of Overall Risk for standard products ($M=3,14$, $SE=0,12$), than for co-created products ($M=3,29$,

SE=0,13). However, from Figure 27 it can be concluded that the F-value for the main effect of the independent variable Design Paradigm on the dependent variable Overall Risk is not significant, $F(1,252)=0,73$, $p=0,40$. The interaction effect between Design Paradigm and Brand are not significant either, $F(3,252)=0,86$, $p=0,97$. Based on these findings the conclusion must be drawn that no significant differences can be found to support any divergence between standard products and co-created products. For this, hypothesis 4 is rejected.

Hypothesis 5

To examine hypothesis 5 a Two-way ANOVA will be conducted, with the 2 categorical independent variables, Design (0=Standard; 1=Co-Created), and Previous Participation (0=Non-Participant; 1=Previous Participant). These variables and their interaction are examined for their effect on the dependent variable Perceived Risk, which is the mean of the Overall Risk scale of Stone and Grönhaug (1993). Particular interest lies in the interaction effect between Design and Previous Participation. For the hypothesis to hold, the interaction effect between Design and Previous Participation on the Overall Risk must be significant and further tests should indicate that these differences are among Non-Participants for Co-Created products and Previous Participant for Co-Created products, see table in Figure 28.

Previous Participation	Design	Respondent
0	0	**Non-Participant, Standard Product**
0	1	**Non-Participant, Co-Created Product**
1	0	**Previous Participant, Standard Product**
1	1	**Previous Participant, Co-Created Product**

Figure 28. Numerical Codes For Dummy Variables Hypothesis 5.

Levene's test for homogeneity of variances is non-significant at 0,33 (>0,05), allowing usage of the ANOVA test. Appendix 7 contains the SPSS Output for Hypothesis 5, including Levene's test. Figure 29 shows the Test of Between-Subject Effect for Hypothesis 5.

Tests of Between-Subjects Effects

Dependent Variable: Overall_Risk

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	12,933[a]	3	4,311	2,205	**,088**
Intercept	1672,631	1	1672,631	855,646	**,000**
Participation	,465	1	,465	,238	**,626**
Design	1,728	1	1,728	,884	**,348**
Participation * Design	11,688	1	11,688	5,979	**,015**
Error	498,478	255	1,955		
Total	3203,270	259			
Corrected Total	511,411	258			

a. R Squared = ,025 (Adjusted R Squared = ,014)

Figure 29. SPSS Output Test of Between-Subjects Effects H5.

Figure 29 shows that the F-value for the main effect of Participation on Overall Risk is non-significant, $F_{(1,255)}=0,24$, $p=0,62$. From this, it can be concluded that, *ceteris paribus* having participated previously in co-creation does not affect Overall Risk in general, not discriminating for Design Paradigm.

The main effect of Design Paradigm on Overall Risk does not have a significant F-value either, $F_{(1,255)}=0,88$, $p=0,35$. This means that there is no significant deviation between Standard products and Co-Created products in the effect of Design Paradigm on Overall Risk.

However, as hypothesized, the interaction effect of Design Paradigm and Previous Participation, does have a significant F-value, $F_{(1,255)}=5,98$ $p<0,05$. Figure 29 shows that, in contrast to Non-Participant who experience more Overall Risk for Co-Created Products ($M=3,41$, $SD=1,52$) than for Standard Products ($M=3,09$, $SD=1,32$), Previous Participants of Co-Creation perceive less Overall Risk in the purchase of a Co-Created product ($M=2,77$, $SD=1,28$) than that of a Standard product ($M=3,51$, $SD=1,32$). Since, ANOVA only provides the total effect of the interaction between Design Paradigm and Previous Participation on Overall Risk, further investigation is necessary to conclude that the hypothesis indeed holds for Co-Created products.
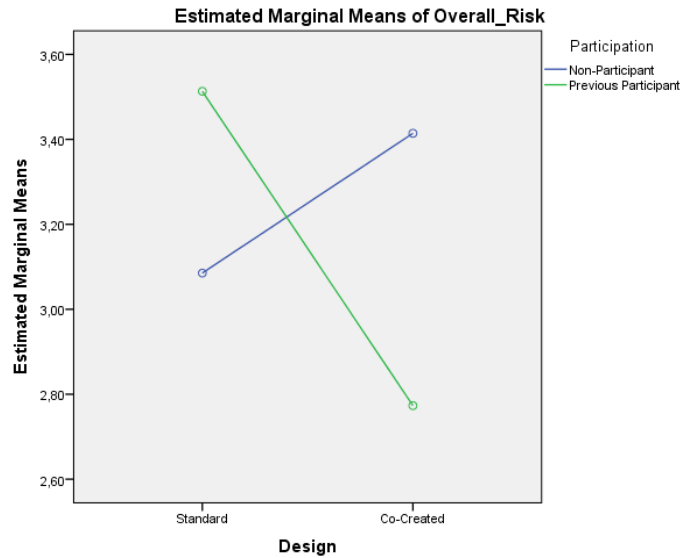
Figure 30. Interaction Plot Hypothesis 5.

To investigate the within-subject effects of the interaction between Design Paradigm and Previous Participation in Overall Risk, the syntax option in SPSS is used to create a MANOVA test including the within-subject effects. This output too, can be found in Appendix 7.

The within-subject effect of the test shows that, the F-value for Previous Participation of Standard products, is not significant at, $F(1,255)=1,22$ $p=0,27$. For the hypothesis to be adopted, the F-value for Previous Participation on Co-Created Design Paradigm should be significant. However, the F-value for Previous Participation of Co-Created products is non-significant as well, at $F(1,255)=3,32$ $p=0,07$ (0,07>0,05). Based on the results of the factorial ANOVA and the MANOVA, hypothesis 5 is rejected.

Hypothesis 6

To examine hypothesis 6 a factorial ANOVA is conducted, with Purchase Likelihood as the dependent variable and the dummy variables for Design (0=Standard; 1=Co-Created) and Involvement (0=Low Involvement; 1=High Involvement) as the independent variables. For the hypothesis to hold, the interaction effect between Design and Involvement on Purchase Likelihood must be significant. More precisely the mean value of Purchase Likelihood for Co-Created Low Involvement must be significantly higher than that of Co-Created High Involvement. Figure 31 shows the table with the dummy variables of interest.

Involvement	Design	Respondent
0	0	**Low Involvement, Standard Product**
0	1	**Low Involvement, Co-Created Product**
1	0	**High Involvement, Standard Product**
1	1	**High Involvement, Co-Created Product**

Figure 31. Numerical Codes For Dummy Variables Hypothesis 6.

Levene's test is non-significant at $p=0,72$ (0,72>0,05), implicating that the assumption of homogeneity of variances is respected. For this, the output of the ANOVA test can be further evaluated.

Figure 32 displays the main table of the ANOVA test, the Between-Subject Effects for hypothesis 6. The complete SPSS output can be found in Appendix 8.

Tests of Between-Subjects Effects

Dependent Variable: PL

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	56,799[a]	3	18,933	8,582	,000
Intercept	2861,285	1	2861,285	1296,925	,000
Design	6,459	1	6,459	2,928	**,088**
Involvement	50,864	1	50,864	23,055	**,000**
Design * Involvement	,191	1	,191	,087	**,769**
Error	560,376	254	2,206		
Total	3472,188	258			
Corrected Total	617,176	257			

a. R Squared = ,092 (Adjusted R Squared = ,081)

Figure 32. SPSS Output Test of Between-Subjects Effects H6.

From the SPSS output table of Figure 32 it can be concluded that the main effect of Design Paradigm on Purchase Likelihood is non-significant, $F(1,254)=2,93$, $p=0,09$ (0,09>0,05). Basically, this outcome states that there is no significant difference (at $p<0,05$) between standard products and co-created products on Purchase Likelihood.

The SPSS Output of Figure 32, also shows that the main effect of Involvement on Purchase Likelihood is significant, at $F(1,254)=23,06$, $p<0,05$. The mean of Purchase Likelihood for

Low Involvement products (*M*=3,78, *SD*=1,47) is higher than the mean of Purchase Likelihood of High Involvement products (*M*=2,89, *SD*=1,37). This indicates that consumers are more likely to purchase Low Involvement products than High Involvement products.

The interaction effect of Design Paradigm and Involvement on Purchase Likelihood, as explained previously, is the most important effect for answering the hypothesis. However, the F-value for this effect is not significant, at $F(1,254)=0,09$, $p=0,769$. By use of the syntax in SPSS, a MANOVA model is created to investigate the partial effects of Design within Involvement levels on Purchase Likelihood. The outcome of this test shows, that Involvement within Design is significant, $F(1,2)=10,38$, $p=0,001$ for Low Involvement, and at $F(1,2)=12,27$ $p=0,001$ for High Involvement.

Based on these results, hypothesis 6 is accepted.

Hypothesis 7

A factorial ANOVA is used to examine hypothesis 7, where the dependent variable is Overall Risk and the independent variables are Design Paradigm (0=Standard; 1=Co-Created) and Firm Type (0=Unknown; 1=Known). For hypothesis 7 to hold, the interaction effect of Design Paradigm and Firm type on Overall Risk must be significant. More specifically, the mean value of Overall Risk for Co-Created product Unknown firm must be higher than that of Co-Created product Known firm. Low Involvement must be significantly higher than that of Co-Created High Involvement. Figure 33 shows the table with the dummy variables of interest.

Firm Type	Design	Respondent
0	0	Unknown Firm, Standard Product
0	1	Unknown Firm, Co-Created Product
1	0	Known Firm, Standard Product
1	1	Known Firm, Co-Created Product

Figure 33. Numerical Codes For Dummy Variables Hypothesis 7.

The assumption of homogeneity of variances is respected, since Levene's test is non-significant at $p=0,73$ (0,73>0,05), allowing the use of the ANOVA test results. The SPSS

output of the tests for hypothesis 7 can be found in Appendix 9. Figure 34 shows the SPSS output of the Between-Subject Effects test of ANOVA.

Tests of Between-Subjects Effects

Dependent Variable: Overall_Risk

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	10,000[a]	3	3,333	1,547	,203
Intercept	2685,723	1	2685,723	1246,511	,000
Design * Firm	,465	1	,465	,216	**,642**
Firm	7,973	1	7,973	3,700	**,056**
Design	1,722	1	1,722	,799	**,372**
Error	551,576	256	2,155		
Total	3250,731	260			
Corrected Total	561,576	259			

a. R Squared = ,018 (Adjusted R Squared = ,006)

Figure 34. SPSS Output Test of Between-Subjects Effects H7.

As can be seen in the table of Figure 34, the *F*-value for the main effect of Design Paradigm on Overall Risk is non-significant, $F(1,256)=0,80$, $p=0,37$. From this, one should conclude that *ceteris paribus* there is no significant difference between Standard and Co-Created products on Overall Risk perception.

The *F*-value for the main effect of Firm Type on Overall Risk, is very close to significance, however given the significance level of $p<0,05$ this effect is considered non-significant, $F(1,256)=3,7$, $p=0,056$ (0,056>0,05). If this main effect on Overall Risk would have had a significant result, it would verify that consumers perceive more Overall Risk in the purchase of products from Unknown Firms ($M=3,39$, $SE=0,13$) than from Known Firms ($M=3,04$, $SE=0,13$). However, for now, it must be concluded that this effect is not proven given the significance level of $p<0,05$.

As mentioned previously, the effect that would validate hypothesis 7, is the interaction effect of Firm Type and Design Paradigm on Overall Risk. Figure 35 contains the Estimated Marginal Means plot of Overall Risk for hypothesis 7.
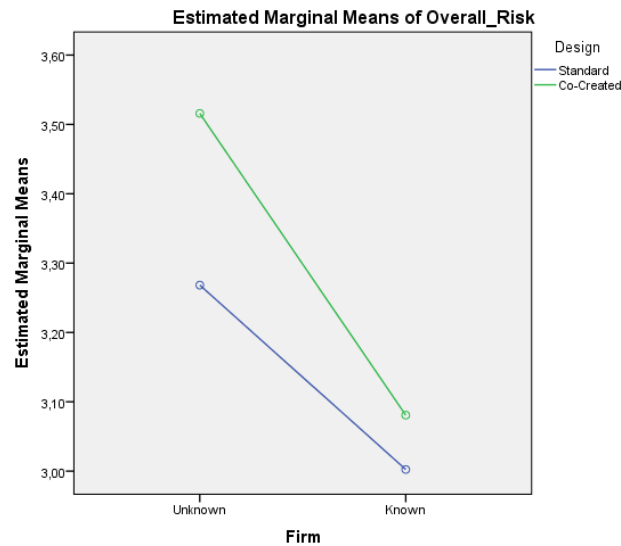
Figure 35. Plot of Estimated Marginal Means of Overall Risk for H7.

As can be seen in the plot of Figure 35, the marginal mean of Overall Risk for Co-Created products show a steeper decline from Unknown Firm to Known Firm, than Standard products. This could indicate that Firm Type is more important for Co-Created products than for Standard products. However, *F*-value the interaction effect of Design Paradigm and Firm Type on Overall Risk, is not significant, $F(1,256)=0,22$, $p=0,64$. For this, hypothesis 7 must be rejected. A close to significant effect of Firm Type on Overall Risk does exist, indicating possible difference between products from Unknown and Known brands in terms of Overall Risk perception, however, there is no clear evidence from which it could be concluded that this difference can be discriminated between Standard and Co-Created products.

Additional Analysis

In addition to the hypotheses that were tested, 2 more variables will be examined, since they might be insightful for management purposes.

Financial Risk
The first additional variable that will be examined is Financial Risk. The Financial Risk scale of Mieres et al. (2006) was included in all surveys and measured for each brand and for both design paradigms (standard and co-created). A factorial ANOVA has been set up, with the mean of the Financial Risk scale of Mieres et al. (2006) as the dependent variable, and Brand (1=Lay's; 2=Crisp; 3=Dell; 4=Chip) and Design Paradigm (0=Standard; 1=Co-Created) as the

independent variables. Levene's test is non-significant at $p=0,93$. For this, the ANOVA table in Figure 36 and the SPSS output (which can be found in Appendix 10) are appropriate to use.

Tests of Between-Subjects Effects

Dependent Variable: Financial_Risk

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	29,142[a]	7	4,163	1,910	,068
Intercept	3689,641	1	3689,641	1692,333	,000
Design	,002	1	,002	,001	**,979**
Brand	24,847	3	8,282	3,799	**,011**
Design * Brand	5,129	3	1,710	,784	**,504**
Error	547,233	251	2,180		
Total	4284,483	259			
Corrected Total	576,375	258			

a. R Squared = ,051 (Adjusted R Squared = ,024)

Figure 36. SPSS Output Test of Between-Subjects Effects Financial Risk.

If there would be any differences between standard products and co-created products in terms of financial risk the main effect of Design Paradigm on Financial Risk, or the interaction effect of Design Paradigm and Brand on Financial Risk must show significant F-values. However, the main effect of Design Paradigm on Financial Risk is not significant at $F(1,251)=0,001$, $p=0,979$. The interaction effect of Design Paradigm and Brand on Financial Risk is not significant either, $F(3,251)=0,78$, $p=0,50$. For this it must be concluded that consumers do not perceive more or less Financial Risk when they purchase a co-created product rather than a standard product.

Willingness To Pay

The next additional analysis that is done, is Willingness to Pay (WTP). The Willingness to Pay scale of Chen et al. (1998) was added to the survey as well. The scale consisted of 2 separate measures. The first measure gave an interval ratio and asked how much respondents were willing to pay for the product on a 7-point Likert scale. The third interval of the scale (interval 3 of 7) represented the actual price. The second measure first informed the respondent of the actual retail price and after asked how likely it was for them to purchase this product, again on a 7-point Likert scale.

However, for this research the interest lies in the difference between standard and co-created products, and not so much on the difference in price perception and the reaction of the consumer. For this reason, rather than investigating differences between the two scales, a

Two-way ANOVA is conducted for each of the scales to detect differences in Design Paradigm.

The first test has been done on the first scale, which will be called WTP1 (Willingness to Pay 1). WTP is the dependent variable, were the independent variables are Design Paradigm (0=Standard; 1=Co-Created) and Brand (1=Lay's; 2=Crisp; 3=Dell; 4=Chip). Levene's test is non-significant at $p=0,37$. The SPSS output can be found in Appendix 10. Figure 37 shows the main ANOVA table.

Tests of Between-Subjects Effects

Dependent Variable: WTP1

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	59,730[a]	7	8,533	6,995	,000
Intercept	2685,781	1	2685,781	2201,856	,000
Design	,471	1	,471	,386	**,535**
Brand	54,589	3	18,196	14,918	**,000**
Design * Brand	4,264	3	1,421	1,165	**,324**
Error	303,725	249	1,220		
Total	3044,000	257			
Corrected Total	363,455	256			

a. R Squared = ,164 (Adjusted R Squared = ,141)

Figure 37. SPSS Output Test of Between-Subjects Effects WTP1

The ANOVA table of Figure 37 shows the significance values of the *F*-test. The main effect of Design Paradigm on WTP1 is not significant at, $F(1,249)=0,39$, $p=0,54$. There is no difference between Standard Products and Co-Created Products in consumer's Willingness to Pay.

The second factorial ANOVA was conducted, were WTP2 (Willingness to Pay 2) functioned as the dependent variable, and Brand (1=Lay's; 2=Crisp; 3=Dell; 4=Chip) and Design Paradigm (0=Standard; 1=Co-Created) functioned as independent variables. Levene's test is not significant at $p=0,25$, allowing for the use of the ANOVA test outcomes.

Tests of Between-Subjects Effects

Dependent Variable: WTP2

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	199,683[a]	7	28,526	10,799	,000
Intercept	3252,728	1	3252,728	1231,365	,000
Design	6,247	1	6,247	2,365	,125
Brand	191,779	3	63,926	24,200	,000
Design * Brand	4,104	3	1,368	,518	,670
Error	657,749	249	2,642		
Total	4108,000	257			
Corrected Total	857,432	256			

a. R Squared = ,233 (Adjusted R Squared = ,211)

Figure 38. SPSS Output Test of Between-Subjects Effects WTP2

As can be seen in the ANOVA table of Figure 38, the main effect of Design Paradigm on WTP2 is not significant at, $F(1,249)=2,37$, $p=0,13$.

Based on both the outcome of the Two-way ANOVA for WTP1 and that of WTP2, it can be concluded that consumers are willing to pay approximately the same for a co-created version of the product the standard product.

Results Summary Table

The table of Figure 39 sums up the results discussed in the Results section of the paper.

H1	Consumers have more trust in advice and recommendations when these concern designer-driven products, than they have in advice and recommendations, provided by co-creators, concerning user-driven products	**ACCEPTED**
H2	After interaction with co-creators within their social network, consumers are more likely to believe that crowdsourced products will fulfill their needs.	**ACCEPTED**
H3	Consumers believe crowdsourcing brings a lower quality product than products that are the result of the traditional supply chain.	**REJECTED**
H4	Consumers in general perceive a higher expected risk when the product is the result of crowdsourcing.	**REJECTED**
H5	Consumers who have participated in the crowdsourcing process perceive lower risk in the purchase of the user-driven product than consumers who have not participated in the co-creation process.	**REJECTED**
H6	Consumers are more likely to purchase user-driven products of low product importance (i.e. involvement), than user-driven products of high product importance (i.e. involvement).	**ACCEPTED**
H7	The perceived risk of consumers is lower when the co-created product is offered by a known brand (designer-driven brand that has adopted user-driven activities), as compared to the unknown brand (purely user-driven firm).	**REJECTED**

Figure 39. Summary Table Of Results Section

Conclusions & Recommendation

This section of the paper will cover the conclusions based on the results, followed by managerial implications in the form of recommendations.

Conclusion

Co-creation has been a hot topic in recent years. Where many companies are formed based on the idea of co-creation, an increasing number of traditionally operating firms have been adopting co-creation activities into their day-to-day business. Since these user-driven products go through a different supply chain than the traditional designer-driven products, the purchase behavior of consumers might deviate. Understanding the effects of adopting co-created products, in terms of consumer's purchase perception, is essential for the successful implementation of these products by companies. The main objective of this research paper has been to identify the perceived behavioral differences between acquisition of user-driven and designer-driven products. The following research question has functioned as the basis of this paper;

As compared to the purchase of standard products, how are crowdsourcing initiatives influencing the purchase behavior of consumers who do not participate in open-innovation activities?

This study has differentiated between 4 sub areas of purchase behavior, namely the effect of trust in product recommendations from social contacts, the associated perceived risk in the purchase of a product, the financial implications of adopting a product, and the purchase likeability as a whole.

Where risk has been analyzed in terms of overall risk, additional attention has been given to the sub-risk factor quality risk as well. The results indicate that consumers do not perceive any difference for overall risk nor for the specified quality risk between standard products, designer-driven, and co-created products, user-driven. The performance, quality, risk only deviated between low involvement products and high involvement products, where consumers indicate that they perceive more risk in the purchase of a high involvement product. This research also indicates that there is no difference in the overall risk perception of consumers who have previously participated in a co-creation activity. Consumers who have participated in co-creation previously are expected to perceive the same overall risk in the purchase of an item, as consumers who have no previous experience in co-creation. Whether a brand is known by consumers, or is unknown to the consumer does not affect the overall risk that the

buyer experiences. For this it is concluded that there are no differences in consumers' risk perception in the purchase of a co-created product, as compared to the standard product acquisition.

In the same line, the purchase likelihood of standard products, user-driven, and co-created products, designer-driven, do not deviate. Consumers are just as likely to purchase a product that is designed by a corporation than they are purchasing products that are invented by users. Recommendations by peers effect both buying situations, where consumers are more likely to purchase a product that is recommended to them. However, when a designer-driven product is recommended to the consumer, the consumer has more trust in the endorsement that is provided, than when this recommendation is presented by a social contact for a co-created product, in which the social contact has been a participant of the co-creation process.

The analysis of the financial variables, the willingness to pay for a product and the perceived financial risk of purchasing a product, indicate that there are no differences between standard, designer-driven, and co-created, user-driven, products. Consumers are willing to pay the same amount of money for a standard product as for a co-created product. When considering a the purchase of a co-created product, consumer face the same level of financial risk as they would if it were a standard product.

In sum, this study has shown that no differences exist in the purchase behavior of consumers buying a co-created product or a standard product. The only deviating effect that exists between standard products and co-created products, is the level of trust in the recommendation from a peer, where the peers that have participated in the co-creation process are considered less trustworthy when they refer that co-created product, than the trustee that endorses a standard product.

Recommendations

Based on the conclusions drawn from the results, recommendations can be made for managerial purposes. As Vargo and Lusch (2004) have pointed out, the current consumer market is making a shift towards a service-oriented atmosphere. Given the technological developments, opportunities have been created for consumers to interact with companies. These new empowered consumers feel the need to participate in activities like co-creation. Previous research has examined the implications of adopting co-creation activities for firms, among which Nambisan and Nambisan, (2008). This research has focused on one of these implications, namely the consumer purchase behavior. This study has shown that consumers do not perceive additional risk in the purchase of a co-created product, nor differences in the purchase likelihood between the traditional products, designer-driven, and co-created products, user-driven. For this, in terms of consume purchase perception, one can recommend companies to actively participate in co-creation processes, by offering it's consumers platforms on which they can provide their ideas, especially when the products that are offered are of low involvement. Not only will this save costs, since the idea generation is outsourced, and bring more creative ideas, 'The Power of the Crowd', but this will please the new empowered consumers by taking them seriously and showing appreciation for their opinion. Furthermore, participation in crowdsourcing initiatives will increase the feeling of innovativeness that the consumer market feels for the company. This study has shown no differences between standard products and co-created products in purchase behavior of consumers, reassuring that companies will still be able to sell their products, like they traditionally did. However, since co-creators are perceived as less trustworthy when recommending the product, it is important not rely on the co-creators in terms of marketing and sales. Marketing activities are essential to create awareness among consumers and convince the consumer that purchasing the co-created product will lead the buyer to the desired state. The costs of marketing, can be covered by sales, as in the traditional supply chain, since this study verifies that consumers are willing to pay just as much for a co-created product as for a traditional product. In bullet point, 3 managerial recommendations are made;

➢ Adopt co-creation activities, to please empowered consumers and stay competitive in innovativeness, especially when selling low involvement products.

➢ Price the co-created products, as you would the traditional products.

➢ Keep investing in marketing activities, do not rely solely on the word-of-mouth recommendations of co-creators.

Discussions and Limitations

This section of the paper will present an overview of the topics that were tested in this research and the associated limitations of these tests.

Tie-Strength of Recommendation

Both hypothesis 1 and hypothesis 2 measure the influence of interaction with social contacts. In the survey, respondents were shown a product recommendation which, as they were told, was provided by a very close friend. These hypotheses were created, based on the idea of Kotler and Keller (2012), that consumers are not able to make rational decisions, but are led by emotions. One would expect these hypotheses to hold given the fact that the respondent was informed that the endorsement was given by a trusted social contact. However, as Brown et al. (2007) point out, the strength of the tie with the social contact is of great influence, which is referred to as the multi-dimensional, interpersonal relation. These hypotheses were tested in the absence of consideration of tie-strength with the recommender. Respondents were simply asked to imagine that the recommendation was provided by a close contact, without any further elaboration on the type of contact. Although both hypotheses were accepted, the effects described by Brown et al. (2007) were not incorporated in the examination. If the respondent was actually advised by a social contact with which a certain pre-existing tie-strength was already accomplished, the answers might have deviated.

Involvement

Hypothesis 6 and the additional analysis of hypothesis 3, have examined the differences in effects between product involvement levels. As Dodds et al. (1991) explain, the purchase of low involvement products brings less perceived risk than that of high involvement products. In line with Dodds et al. (1991), hypothesis 6 has been accepted. Where the purpose of this study has been to detect differences between standard and co-created products, the analysis has simply verified previous research papers in the differences between involvement levels in general. The hypothesis has been accepted, which verifies that the main effect pointed out by Dodd et al (1991) is applicable for co-created products as well.

Perceived Risk

Hypothesis 3, 4, 5 ad 7, all concerned either overall risk or performance, quality, risk. Based on research of Yeung et al. (2011), who state that an increase in uncertainty would increase

risk, it was assumed, given the fact that co-created products bring more uncertainty due to the unknown source, that the risk would be higher than that of standard products. Although, the mea values were indeed higher for co-created products than for standard products, all of these hypotheses have been rejected based on non-significance of the differences. However, several factors have influenced the outcome of these results. For one, the scales were all measured, after the recommendation. As Simcock et al. (2006) explain, reassurance diminishes risk. If the scales were measured before the recommendation, the results might have been different. Furthermore, the recommendation was provided by a known source, a social contact, where the assumption of these hypotheses was, that the process of co-creation takes place by an unknown group of individuals, in contrast to standard production which is offered by a known brand. Based on the assumption concerning co-creation, and the findings of Kim et al. (2008) that uncertainty increases when the producers are unknown, the hypotheses were created, however given the recommendation, the assumption under which the hypotheses were planned, by forehand were violated.

Next, as Dodds et al. (1991) enlightened, pricing positively influences quality. Since the same prices were directed to the standard and co-created versions of the products, the same quality signal was presented. If it would have been a real market with slightly different prices, or perhaps the prices were not provided before measuring the scales, the outcomes might have been different. For this, it must be concluded, that the survey strategy might have influenced the outcome of the test results.

Previous Participation

The intention of hypothesis 5 was to measure the difference in risk perception between the participants of a co-creation activity and the non-participants. Siegrist (2008) has explained that benefits are more easily acknowledged when these are offered by trusted sources. This would mean that the trade-off between risk and associated benefits would result in less risk and increased purchase likelihood. Co-creators, according to Leimeister (2010) have a tie with the company for which they have participated in the co-creation activity. For this, it was expected that co-creators would have higher purchase likelihood and expect less risk when considering the product that they have participated in the co-creation for. This effect has not been measured as planned. To test this effect, a product must be presented to a participant that was involved in the co-creation of that same product, and to a non-participant in this process. Given the limited survey response of co-creation participants of Lay's and Dell, this effect could not be examined. Rather, the difference between persons that have previously

participated in any kind of co-creation and persons that have not participated in co-creation is detected. For this, the hypothesis is not tested as it should, to indicate if the conclusions based on the theoretical research are indeed correct.

Need Perception Scale

Hypothesis 2 was measured using the Purchase Likelihood scale of Schreier et al. (2012). The scale was used twice, ones before the recommendation, and again after. To test the effect of the recommendation, the results of before and after recommendation were compared. The initial intention of the hypothesis was to measure perceived need, by use of the Á Priori Need Satisfaction scale of Taylor and Baker (1994). Respondents were asked at the start of the survey to rate the Perceived Need scale for their need for co-created chips and co-created laptops. At the end of the survey, after the recommendation, respondents were asked to rate their need perception again, now for the co-created product they were presented to in the survey. However, after data collection, the conclusion was drawn that the results were useless, as the first measurement monitored the need for a product type and the second measured the need for a specific product. Before the consumer was asked to rate the need scale for the second time, a lot of information was provided, for example the price was indicated. Due to these failures in measurement, the scale was dropped, and replaced by the Purchase Likelihood scale of Schreier et al. (2012), as this scale did meet the requirements, and was measured directly before and after recommendation. Although the hypothesis is accepted, the multi-dimensionality of the ties-strength was not considered in the measurement and a more appropriate measurement scale was available than the one on which the current result is based.

Consumers' Perception

All of the questions in the survey, involved the perception of the respondent. In line with research of Freud on human motives, Reynolds and Gutman (1988) point out the incapability of consumers to understand their own motives. Verbeke et al. (2007) add to this, by pointing out, that consumers might not foresee underlying risks that are actually present, and in contrast they might feel risks that are in fact not present. Previous research has shown, that consumers are not a good judge of their own future behavior, as they might claim that they would feel something, while when they are actually confronted with the situation, they might act differently. This entire research is based on the perception of consumers. As no actual purchase has taken place, the results are an indication of how the consumer thinks he or she will react. For this, the trustworthiness of the findings are debatable.

Recommendations for Future Research

As can be read in the Discussion and Limitations section of this paper, many effects are not grasped due to inference and additional effects that were not accounted for. While theory suggests that there should be at least some differences between standard and co-created products in terms of purchase behavior, current research has failed to detect the differences. For future research it is recommended to test the differences between standard and co-created products in an experimental setting, rather than a survey method. Evaluating risk perception in an actual purchase situation will give more trustworthy outcomes. Furthermore, a different recommendation system should be used. For example, one could use a snowball effect, where person A is asked to give the name and contact details, email-address, of a close friend, person B. Than person B is instructed to give a recommendation to person A, without informing person A than this is an assignment. Person A than would be interviewed, and the results could be compared to that of respondents who have not been given a recommendation. In addition, it would be of great value to conduct the test using participant and non-participants of an actual co-creation activity, to capture the differences between co-creators and non-participants of a co-creation situation. Other areas of interests for future studies could be post-purchase behavior evaluation.

Appendix

Appendix 1. Validity & Reliability Overview

Question	Subject	Alpha Score	KMO	Items Deleted
Q1.4	á Priori Satisfaction Co-Created Chips	0,902	0,729	0
Q1.5	á Priori Satisfaction Co-Created Laptop	0,93	0,758	0
Q2.2 - Q2.4	Product/Purchase Involvement Chips	0,773	0,613	0
Q2.6 - Q2.8	Product/Purchase Involvement Laptop	0,818	0,725	0
	Lay's Standard			
Q3.2 - Q 3.6	Brand Likeability Lay's	0,937	0,818	0
Q3.8 & Q3.9	Design Expertise Lay's Standard	0,857	0,5	Low Validity
Q3.10	Perceived Risk Lay's Standard	0,903	0,658	3.10.1
Q3.11	Perceived Performance Risk Lay's Standard	0,71	0,589	0
Q3.12	Perceived Financial Risk Lay's Standard	0,904	0,739	0
Q3.14-Q3.16	Purchase likelihood Lay's Standard	0,925	0,658	0
Q3.20	Trust in WOM recommendation Lay's Standard	0,837	0,658	3.20.1
Q3.21-Q3.23	Purchase likelihood Lay's Standard (after recommendation)	0,93	0,83	0
	Chip Co-Created			
Q3.25 & Q3.26	Design Expertise Chip Co-Created	0,89	0,5	Low Validity
Q3.27	Perceived Risk Chip Co-Created	0,941	0,778	3.27.1
Q3.28	Perceived Performance Risk Chip Co-Created	0,931	0,845	0
Q3.29	Perceived Financial Risk Chip Co-Created	0,88	0,732	0
Q3.31 - Q3.33	Purchase likelihood Chip Co-Created	0,963	0,778	0
Q3.37	Trust in WOM recommendation Chip Co-Created	0,839	0,778	3.37.1 & 3.37.3
Q3.38 - Q3.40	Purchase likelihood Chip Co-Created (after Recommendation)	0,953	0,739	0
Q3.41	á Priori Satisfaction Chip Co-Created (after Recommendation)	0,957	0,765	0
	Chip Standard			
Q4.2 & 4.3	Design Expertise Chip Standard	0,719	0,5	Low Validity
Q4.4	Perceived Risk Chip Standard	0,665	0,791	4.4.2
Q4.5	Perceived Performance Risk Chip Standard	0,812	0,635	0
Q4.6	Perceived Financial Risk Chip Standard	0,867	0,731	0
Q4.8 - Q4.10	Purchase likelihood Chip Standard	0,939	0,791	0
Q4.14	Trust in WOM recommendation Chip Standard	0,883	0,791	4.14.1
Q4.15 - Q4.17	Purchase likelihood Chip Standard (after recommendation)	0,98	0,84	0
	Lay's Co-Created			
Q4.19 - Q4.23	Brand Likeability Lay's	0,98	0,833	0
Q4.25 & Q4.26	Design Expertise Lay's Co-Created	0,782	0,5	Low Validity
Q4.27	Perceived Risk Lay's Co-Created	0,831	0,669	0
Q4.28	Perceived Performance Risk Lay's Co-Created	0,914	0,773	0
Q4.29	Perceived Financial Risk Lay's Co-Created	0,958	0,772	0
Q4.31 - Q4.33	Purchase likelihood Lay's Co-Created	0,943	0,669	0
Q4.37	Trust in WOM recommendation Lay's Co-Created	0,83	0,669	4.37.1 & 4.37.2
Q4.38- Q4.40	Purchase likelihood Lay's Co-Created (after Recommendation)	0,963	0,786	0
Q4.41	á Priori Satisfaction Lay's Co-Created (after recommendation)	0,973	0,78	0

Question	Subject	Alpha Score	KMO	Items Deleted
	Dell Standard			
Q5.2 - Q5.6	Brand Likeability Dell	0,944	0,892	0
Q5.8 & Q5.9	Design Expertise Dell Standard	0,832	0,5	Low Validity
Q5.10	Perceived Risk Dell Standard	0,768	0,655	0
Q5.11	Perceived Performance Risk Dell Standard	0,934	0,633	0
Q5.12	Perceived Financial Risk Dell Standard	0,931	0,762	0
Q5.14 - Q5.16	Purchase Likelihood Dell Standard	0,955	0,655	0
Q5.20	Trust in WOM recommendation Dell Standard	0,862	0,655	5.20.1
Q5.21 - Q5.23	Purchase Likelihood Dell Standard (after Recommendation)	0,916	0,685	0
	Crisp Co-Created			
Q5.25 & Q5.26	Design Expertise Crisp Co-Created	0,927	0,5	Low Validity
Q5.27	Perceived Risk Crisp Co-Created	0,924	0,622	0
Q5.28	Perceived Performance Risk Crisp Co-Created	0,905	0,839	0
Q5.29	Perceived Financial Risk Crisp Co-Created	0,918	0,688	0
Q5.31 - Q5.33	Purchase likelihood Crisp Co-Created	0,949	0,622	0
Q5.37	Trust in WOM recommendation Crisp co-created	0,873	0,622	5.37.1 & 5.37.5
Q5.38 - Q5.40	Purchase likelihood Crisp Co-Created (after recommendation)	0,93	0,731	0
Q5.41	á Priori Satisfaction Crisp Co-Created (after recommendation_	0,94	0,706	0
	Crisp Standard			
Q6.2 & Q6.3	Design Expertise Crisp Standard	0,865	0,5	Low Validity
Q6.4	Perceived Risk Crisp Standard	0,912	0,778	0
Q6.5	Perceived Performance Risk Crisp Standard	0,796	0,753	0
Q6.6	Perceived Financial Risk Crisp Standard	0,894	0,706	0
Q6.8-Q6.10	Purchase Likelihood Crisp Standard	0,818	0,778	0
Q6.14	Trust in WOM recommendation Crisp Standard	0,804	0,778	6.14.1 & 6.14.3 &6.14.4
Q6.15 - Q6.17	Purchase likelihood Crisp Standard (after recommendation)	0,905	0,759	0
	Dell Co-Created			
Q6.19 - Q6.23	Brand likeability Dell	0,938	0,842	0
Q6.25 & Q6.26	Design Expertise Dell Co-Created	0,87	0,5	Low Validity
Q6.27	Perceived Risk Dell Co-Created	0,951	0,7	0
Q6.28	Perceived Performance Risk Dell Co-Created	0,935	0,745	0
Q6.29	Perceived Financial Risk Dell Co-Created	0,901	0,727	0
Q6.31 - Q6.33	Purchase likelihood Dell Co-Created	0,964	0,7	0
Q6.37	Trust in WOM Recommendation Dell Co-Created	0,87	0,7	0
Q6.38 - Q6.40	Purchase likelihood Dell Co-Created (after Recommendation)	0,979	0,793	0
Q6.41	á Priori Satisfaction Dell Co-Created (after recommendation)	0,964	0,781	0

Brand Likeability Dell

Group Statistics

	BL_DELL_DUMMY	N	Mean	Std. Deviation	Std. Error Mean
BL_DELL	Standard	34	4,5059	,92276	,15825
	Co-created	32	4,1375	,90367	,15975

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BL_DELL	Equal variances assumed	,005	,944	1,637	64	,106	,36838	,22501	-,08112	,81788
	Equal variances not assumed			1,638	63,894	,106	,36838	,22486	-,08084	,81761

Brand Likeability Lay's

Group Statistics

	BL_LAYS_DUMMY	N	Mean	Std. Deviation	Std. Error Mean
BL_LAYS	Standard	34	5,1824	,82736	,14189
	Co-created	33	4,8727	1,34891	,23481

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
BL_LAYS	Equal variances assumed	3,595	,062	1,136	65	,260	,30963	,27248	-,23455	,85380
	Equal variances not assumed			1,129	52,808	,264	,30963	,27436	-,24071	,85996

Brand Likeability Lay's

Task Involvement (Purchase Involvement) Per Brand

Purchase Involvement/Task Involvement Lay's

Group Statistics

	PI_Coding_Lays	N	Mean	Std. Deviation	Std. Error Mean
PI_CHIPS	Standard	34	3,6569	1,39138	,23862
	Co-created	31	3,0860	1,13192	,20330

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PI_CHIPS	Equal variances assumed	2,270	,137	1,804	63	,076	,57084	,31648	-,06160	1,20329
	Equal variances not assumed			1,821	62,229	,073	,57084	,31348	-,05575	1,19743

Purchase Involvement/Task Involvement Crisp

Group Statistics

	PI_coding_Crisp	N	Mean	Std. Deviation	Std. Error Mean
PI_CHIPS	Standard	32	3,6042	1,41532	,25020
	Co-created	30	3,7778	1,39604	,25488

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PI_CHIPS	Equal variances assumed	,000	,992	-,486	60	,629	-,17361	,35732	-,88835	,54113
	Equal variances not assumed			-,486	59,839	,629	-,17361	,35716	-,88807	,54085

Purchase Involvement/Task Involvement Dell

Group Statistics

	PI_coding_Dell	N	Mean	Std. Deviation	Std. Error Mean
PI_LAPTOP	Standard	32	5,2917	1,32186	,23367
	Co-created	31	5,6667	,80277	,14418

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PI_LAPTOP	Equal variances assumed	6,380	,014	-1,356	61	,180	-,37500	,27663	-,92815	,17815
	Equal variances not assumed			-1,366	51,399	,178	-,37500	,27458	-,92613	,17613

Purchase Involvement/Task Involvement Chip

Group Statistics

	PI_coding_Chip	N	Mean	Std. Deviation	Std. Error Mean
PI_LAPTOP	Standard	33	5,3838	1,19641	,20827
	Co-created	32	5,8125	,88369	,15622

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
PI_LAPTOP	Equal variances assumed	,434	,512	-1,639	63	,106	-,42866	,26154	-,95131	,09399
	Equal variances not assumed			-1,647	58,893	,105	-,42866	,26034	-,94963	,09231

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Trust_Total

F	df1	df2	Sig.
,244	7	247	,974

Tests the null hypothesis that the error variance of the
dependent variable is equal across groups.

a. Design: Intercept + Design + Brand + Design * Brand

Tests of Between-Subjects Effects

Dependent Variable: Trust_Total

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	31,368[a]	7	4,481	3,105	,004
Intercept	4463,324	1	4463,324	3092,935	,000
Design	5,736	1	5,736	3,975	,047
Brand	23,459	3	7,820	5,419	,001
Design * Brand	1,927	3	,642	,445	,721
Error	356,438	247	1,443		
Total	4863,774	255			
Corrected Total	387,807	254			

a. R Squared = ,081 (Adjusted R Squared = ,055)

Test Results

Dependent Variable: Trust_Total

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	5,736	1	5,736	3,975	,047
Error	356,438	247	1,443		

1. Design

Dependent Variable: Trust_Total

Design	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Standard	4,337	,105	4,130	4,543
Co-Created	4,036	,108	3,824	4,249

2. Brand

Dependent Variable: Trust_Total

Brand	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Lay's	4,228	,149	3,934	4,521
Crisp	4,631	,153	4,330	4,932
Dell	3,773	,151	3,475	4,071
Chip	4,114	,149	3,820	4,407

3. Design * Brand

Dependent Variable: Trust_Total

Design	Brand	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Standard	Lay's	4,512	,206	4,106	4,918
	Crisp	4,771	,212	4,352	5,189
	Dell	3,906	,212	3,488	4,325
	Chip	4,158	,209	3,746	4,569
Co-Created	Lay's	3,944	,216	3,519	4,369
	Crisp	4,492	,219	4,060	4,924
	Dell	3,640	,216	3,215	4,065
	Chip	4,070	,212	3,652	4,489

Multiple Comparisons

Dependent Variable: Trust_Total

Gabriel

(I) Brand	(J) Brand	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Lay's	Crisp	-,3949	,21325	,331	-,9602	,1705
	Dell	,4655	,21238	,163	-,0976	1,0286
	Chip	,1262	,21072	,991	-,4325	,6848
Crisp	Lay's	,3949	,21325	,331	-,1705	,9602
	Dell	,8604*	,21490	,000	,2906	1,4302
	Chip	,5210	,21325	,088	-,0443	1,0864
Dell	Lay's	-,4655	,21238	,163	-1,0286	,0976
	Crisp	-,8604*	,21490	,000	-1,4302	-,2906
	Chip	-,3394	,21238	,505	-,9025	,2237
Chip	Lay's	-,1262	,21072	,991	-,6848	,4325
	Crisp	-,5210	,21325	,088	-1,0864	,0443
	Dell	,3394	,21238	,505	-,2237	,9025

Based on observed means.

The error term is Mean Square(Error) = 1,443.

*. The mean difference is significant at the ,05 level.

Trust_Total

Gabriel

Brand	N	Subset	
		1	2
Dell	63	3,7752	
Chip	65	4,1146	4,1146
Lay's	65	4,2408	4,2408
Crisp	62		4,6356
Sig.		,164	,087

Means for groups in homogeneous subsets
are displayed.

Based on observed means.

The error term is Mean Square(Error) =
1,443.

a. Uses Harmonic Mean Sample Size =
63,723.

b. The group sizes are unequal. The
harmonic mean of the group sizes is used.
Type I error levels are not guaranteed.

c. Alpha = ,05.

Additional Analysis Hypothesis 1

Descriptive Statistics

Dependent Variable: Trust_Total

Design	Involvement	Mean	Std. Deviation	N
Standard	Low Involvement	4,6373	1,16994	66
	High Involvement	4,0338	1,23722	65
	Total	4,3379	1,23681	131
Co-Created	Low Involvement	4,2131	1,17246	61
	High Involvement	3,8586	1,24855	63
	Total	4,0330	1,21984	124
Total	Low Involvement	4,4335	1,18574	127
	High Involvement	3,9476	1,24103	128
	Total	4,1896	1,23564	255

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Trust_Total

F	df1	df2	Sig.
,338	3	251	,798

Tests the null hypothesis that the error variance
of the dependent variable is equal across groups.

a. Design: Intercept + Design + Involvement +
Design * Involvement

Tests of Between-Subjects Effects

Dependent Variable: Trust_Total

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	21,741[a]	3	7,247	4,969	,002
Intercept	4463,534	1	4463,534	3060,512	,000
Design	5,721	1	5,721	3,923	,049
Involvement	14,613	1	14,613	10,019	,002
Design * Involvement	,986	1	,986	,676	,412
Error	366,065	251	1,458		
Total	4863,774	255			
Corrected Total	387,807	254			

a. R Squared = ,056 (Adjusted R Squared = ,045)

Appendix 4. SPSS Output Hypothesis 2

Paired Samples Test

				Paired Differences					
						95% Confidence Interval of the Difference			
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Lays_ST_BR - Lays_ST_AR	-,66176	1,00167	,17178	-1,01126	-,31227	-3,852	33	,001
Pair 2	Lays_CC_BR - Lays_CC_AR	-,22581	,61696	,11081	-,45211	,00050	-2,038	30	,050
Pair 3	Crisp_ST_BR - Crisp_ST_AR	-,74219	1,00700	,17801	-1,10525	-,37913	-4,169	31	,000
Pair 4	Crisp_CC_BR - Crisp_CC_AR	-,56667	1,19794	,21871	-1,01398	-,11935	-2,591	29	,015
Pair 5	Dell_ST_BR - Dell_ST_AR	-,32813	,95343	,16854	-,67187	,01562	-1,947	31	,061
Pair 6	Dell_CC_BR - Dell_CC_AR	-,41935	1,10187	,19790	-,82352	-,01519	-2,119	30	,042
Pair 7	Chip_ST_BR - Chip_ST_AR	-,63636	1,02905	,17914	-1,00125	-,27148	-3,552	32	,001
Pair 8	Chip_CC_BR - Chip_CC_AR	-,60156	1,01572	,17956	-,96777	-,23536	-3,350	31	,002

Levene's Test of Equality of Error Variances[a]

Dependent Variable: PL_AR

F	df1	df2	Sig.
,528	7	247	,813

Tests the null hypothesis that the error variance

of the dependent variable is equal across groups.

a. Design: Intercept + Brand + Design + Brand *

Design

Tests of Between-Subjects Effects

Dependent Variable: PL_AR

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	64,132[a]	7	9,162	3,599	,001
Intercept	3774,537	1	3774,537	1482,733	,000
Brand	58,398	3	19,466	7,647	,000
Design	2,267	1	2,267	,890	,346
Brand * Design	3,265	3	1,088	,427	,733
Error	628,779	247	2,546		
Total	4466,875	255			
Corrected Total	692,910	254			

a. R Squared = ,093 (Adjusted R Squared = ,067)

Test 1: Independent Variables; Brand and Design Paradigm

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Quality

F	df1	df2	Sig.
,404	7	251	,899

Tests of Between-Subjects Effects

Dependent Variable: Quality

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	71,261[a]	7	10,180	5,669	,000
Intercept	3532,285	1	3532,285	1967,048	,000
Design	,264	1	,264	,147	,702
Brand	64,982	3	21,661	12,062	,000
Design * Brand	7,826	3	2,609	1,453	,228
Error	450,728	251	1,796		
Total	4078,438	259			
Corrected Total	521,989	258			

a. R Squared = ,137 (Adjusted R Squared = ,112)

Contrast Results (K Matrix)

Design Helmert Contrast		Dependent Variable Quality
		Quality
	Contrast Estimate	-,064
	Hypothesized Value	0
	Difference (Estimate - Hypothesized)	-,064
Level 1 vs. Level 2	Std. Error	,167
	Sig.	,702
	95% Confidence Interval for Difference Lower Bound	-,392
	Upper Bound	,264

Test Results

Dependent Variable: Quality

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	,264	1	,264	,147	,702
Error	450,728	251	1,796		

1. Design

Dependent Variable: Quality

Design	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Standard	3,666	,115	3,439	3,893
Co-Created	3,730	,120	3,493	3,967

2. Brand

Dependent Variable: Quality

Brand	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Lay's	3,331	,166	3,004	3,659
Crisp	3,388	,168	3,058	3,719
Dell	3,524	,169	3,191	3,856
Chip	4,548	,164	4,225	4,870

3. Brand * Design

Dependent Variable: Quality

Brand	Design	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Lay's	Standard	3,485	,230	3,033	3,938
	Co-Created	3,177	,241	2,703	3,651
Crisp	Standard	3,426	,230	2,974	3,879
	Co-Created	3,350	,245	2,868	3,832
Dell	Standard	3,516	,237	3,049	3,982
	Co-Created	3,532	,241	3,058	4,006
Chip	Standard	4,236	,227	3,790	4,682
	Co-Created	4,859	,237	4,393	5,326

Multiple Comparisons

Dependent Variable: Quality

Gabriel

(I) Brand	(J) Brand	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Lay's	Crisp	-,0522	,23598	1,000	-,6777	,5734
	Dell	-,1853	,23692	,967	-,8134	,4427
	Chip	-1,1951[*]	,23330	,000	-1,8136	-,5767
Crisp	Lay's	,0522	,23598	1,000	-,5734	,6777
	Dell	-,1332	,23783	,994	-,7637	,4973
	Chip	-1,1430[*]	,23422	,000	-1,7638	-,5221
Dell	Lay's	,1853	,23692	,967	-,4427	,8134
	Crisp	,1332	,23783	,994	-,4973	,7637
	Chip	-1,0098[*]	,23517	,000	-1,6331	-,3864
Chip	Lay's	1,1951[*]	,23330	,000	,5767	1,8136
	Crisp	1,1430[*]	,23422	,000	,5221	1,7638
	Dell	1,0098[*]	,23517	,000	,3864	1,6331

Based on observed means.

 The error term is Mean Square(Error) = 1,796.

*. The mean difference is significant at the ,05 level.

Test 2: Independent Variables; Involvement and Design Paradigm

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Quality

F	df1	df2	Sig.
1,318	3	255	,269

Tests the null hypothesis that the error variance

of the dependent variable is equal across groups.

a. Design: Intercept + Design + Involvement +

Design * Involvement

Tests of Between-Subjects Effects

Dependent Variable: Quality

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	34,348[a]	3	11,449	5,987	,001
Intercept	3546,549	1	3546,549	1854,580	,000
Design	,236	1	,236	,124	,725
Involvement	30,765	1	30,765	16,088	,000
Design * Involvement	4,172	1	4,172	2,181	,141
Error	487,641	255	1,912		
Total	4078,438	259			
Corrected Total	521,989	258			

a. R Squared = ,066 (Adjusted R Squared = ,055)

Contrast Results (K Matrix)

Design Helmert Contrast			Dependent Variable Quality
Level 1 vs. Level 2	Contrast Estimate		-,060
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-,060
	Std. Error		,172
	Sig.		,725
	95% Confidence Interval for Difference	Lower Bound	-,399
		Upper Bound	,278

Test Results

Dependent Variable: Quality

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	,236	1	,236	,124	,725
Error	487,641	255	1,912		

1. Design

Dependent Variable: Quality

Design	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Standard	3,674	,119	3,439	3,908
Co-Created	3,734	,124	3,490	3,979

2. Involvement

Dependent Variable: Quality

Involvement	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Low Involvement	3,359	,122	3,119	3,599
High Involvement	4,049	,121	3,810	4,288

3. Design * Involvement

Dependent Variable: Quality

Design	Involvement	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Standard	Low Involvement	3,456	,168	3,126	3,786
	High Involvement	3,892	,169	3,559	4,224
Co-Created	Low Involvement	3,262	,177	2,914	3,611
	High Involvement	4,206	,174	3,863	4,549

Appendix 6. SPSS Output Hypothesis 4

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Overall_Risk

F	df1	df2	Sig.
1,366	7	252	,220

Tests the null hypothesis that the error variance of the

dependent variable is equal across groups.

a. Design: Intercept + Design + Brand + Design * Brand

Tests of Between-Subjects Effects

Dependent Variable: Overall_Risk

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	76,436[a]	7	10,919	5,672	,000
Intercept	2674,060	1	2674,060	1389,007	,000
Design	1,414	1	1,414	,734	,392
Brand	74,227	3	24,742	12,852	,000
Design * Brand	,495	3	,165	,086	,968
Error	485,140	252	1,925		
Total	3250,731	260			
Corrected Total	561,576	259			

a. R Squared = ,136 (Adjusted R Squared = ,112)

Custom Hypothesis Tests

Contrast Results (K Matrix)

Design Helmert Contrast			Dependent Variable
			Overall_Risk
	Contrast Estimate		-,148
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-,148
Level 1 vs. Level 2	Std. Error		,172
	Sig.		,392
	95% Confidence Interval for Difference	Lower Bound	-,487
		Upper Bound	,192

Test Results

Dependent Variable: Overall_Risk

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	1,414	1	1,414	,734	,392
Error	485,140	252	1,925		

Estimated Marginal Means

1. Design

Dependent Variable: Overall_Risk

Design	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Standard	3,137	,119	2,902	3,373
Co-Created	3,285	,124	3,040	3,530

2. Brand

Dependent Variable: Overall_Risk

Brand	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Lay's	2,619	,172	2,279	2,958
Crisp	2,805	,174	2,463	3,147
Dell	3,477	,175	3,133	3,821
Chip	3,944	,168	3,613	4,276

3. Brand * Design

Dependent Variable: Overall_Risk

Brand	Design	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Lay's	Standard	2,603	,238	2,134	3,072
	Co-Created	2,634	,249	2,143	3,125
Crisp	Standard	2,677	,238	2,208	3,145
	Co-Created	2,933	,253	2,434	3,432
Dell	Standard	3,427	,245	2,944	3,910
	Co-Created	3,527	,249	3,036	4,018
Chip	Standard	3,843	,235	3,381	4,305
	Co-Created	4,045	,242	3,570	4,521

Post Hoc Tests

Brand

Multiple Comparisons

Dependent Variable: Overall_Risk

Gabriel

(I) Brand	(J) Brand	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Lay's	Crisp	-,1792	,24433	,976	-,8269	,4685
	Dell	-,8583*	,24531	,003	-1,5086	-,2081
	Chip	-1,3233*	,24068	,000	-1,9613	-,6853
Crisp	Lay's	,1792	,24433	,976	-,4685	,8269
	Dell	-,6792*	,24625	,037	-1,3319	-,0264
	Chip	-1,1441*	,24164	,000	-1,7847	-,5036
Dell	Lay's	,8583*	,24531	,003	,2081	1,5086
	Crisp	,6792*	,24625	,037	,0264	1,3319
	Chip	-,4650	,24263	,293	-1,1081	,1781
Chip	Lay's	1,3233*	,24068	,000	,6853	1,9613
	Crisp	1,1441*	,24164	,000	,5036	1,7847
	Dell	,4650	,24263	,293	-,1781	1,1081

Based on observed means.

The error term is Mean Square(Error) = 1,925.

*. The mean difference is significant at the ,05 level.

Overall_Risk

Gabriel

Brand	N	Subset	
		1	2
Lay's	65	2,6178	
Crisp	64	2,7970	
Dell	63		3,4762
Chip	68		3,9412
Sig.		,975	,297

Means for groups in homogeneous subsets are
displayed.

Based on observed means.

The error term is Mean Square(Error) = 1,925.

a. Uses Harmonic Mean Sample Size = 64,947.

b. The group sizes are unequal. The harmonic
mean of the group sizes is used. Type I error levels
are not guaranteed.

c. Alpha = ,05.

Appendix 7. SPSS Output Hypothesis 5

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Overall_Risk

F	df1	df2	Sig.
1,139	3	255	,334

Tests the null hypothesis that the error variance of the

dependent variable is equal across groups.

a. Design: Intercept + Participation + Design +

Participation * Design

Tests of Between-Subjects Effects

Dependent Variable: Overall_Risk

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	12,933[a]	3	4,311	2,205	,088
Intercept	1672,631	1	1672,631	855,646	,000
Participation	,465	1	,465	,238	,626
Design	1,728	1	1,728	,884	,348
Participation * Design	11,688	1	11,688	5,979	,015
Error	498,478	255	1,955		
Total	3203,270	259			
Corrected Total	511,411	258			

a. R Squared = ,025 (Adjusted R Squared = ,014)

Contrast Results (K Matrix)

Participation Helmert Contrast		Dependent Variable
		Overall_Risk
	Contrast Estimate	,107
	Hypothesized Value	0
	Difference (Estimate - Hypothesized)	,107
Level 1 vs. Level 2	Std. Error	,219
	Sig.	,626
	95% Confidence Interval for Lower Bound	-,324
	Difference Upper Bound	,537

Test Results

Dependent Variable: Overall_Risk

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	,465	1	,465	,238	,626
Error	498,478	255	1,955		

Contrast Results (K Matrix)

Design Helmert Contrast			Dependent Variable Overall_Risk
Level 1 vs. Level 2	Contrast Estimate		,205
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		,205
	Std. Error		,219
	Sig.		,348
	95% Confidence Interval for Difference	Lower Bound	-,225
		Upper Bound	,636

Test Results

Dependent Variable: Overall_Risk

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	1,728	1	1,728	,884	,348
Error	498,478	255	1,955		

Estimated Marginal Means

1. Participation

Dependent Variable: Overall_Risk

Participation	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Non-Participant	3,250	,097	3,059	3,441
Previous Participant	3,143	,196	2,758	3,529

2. Design

Dependent Variable: Overall_Risk

Design	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Standard	3,299	,153	2,999	3,600
Co-Created	3,094	,156	2,786	3,402

3. Design * Participation

Dependent Variable: Overall_Risk

Design	Participation	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Standard	Non-Participant	3,085	,134	2,822	3,349
	Previous Participant	3,513	,274	2,973	4,053
Co-Created	Non-Participant	3,414	,141	3,138	3,691
	Previous Participant	2,773	,280	2,223	3,324

Manova

A n a l y s i s   o f   V a r i a n c e -- Design   1

Tests of Significance for Overall_Risk using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN+RESIDUAL	500,21	256	1,95		
PARTICIPATION WITHIN DESIGN(1)	2,39	1	2,39	1,22	,270
PARTICIPATION WITHIN DESIGN(2)	6,48	1	6,48	3,32	,070
(Model)	11,20	2	5,60	2,87	,059
(Total)	511,41	258	1,98		

R-Squared =   ,022
Adjusted R-Squared = ,014

A n a l y s i s   o f   V a r i a n c e -- Design   2

Tests of Significance for Overall_Risk using UNIQUE sums of squares

Source of Variation	SS	DF	MS	F	Sig of F
WITHIN CELLS	498,48	255	1,95		
Design	1,73	1	1,73	,88	,348
Participation	,47	1	,47	,24	,626
Design BY Participation	11,69	1	11,69	5,98	,015
(Model)	12,93	3	4,31	2,21	,088
(Total)	511,41	258	1,98		

R-Squared =   ,025
Adjusted R-Squared = ,014

Appendix 8. SPSS Output Hypothesis 6

Levene's Test of Equality of Error Variances[a]

Dependent Variable: PL

F	df1	df2	Sig.
,442	3	254	,723

Tests the null hypothesis that the error variance of the
dependent variable is equal across groups.

a. Design: Intercept + Design + Involvement + Design *
Involvement

Tests of Between-Subjects Effects

Dependent Variable: PL

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	56,799[a]	3	18,933	8,582	,000
Intercept	2861,285	1	2861,285	1296,925	,000
Design	6,459	1	6,459	2,928	,088
Involvement	50,864	1	50,864	23,055	,000
Design * Involvement	,191	1	,191	,087	,769
Error	560,376	254	2,206		
Total	3472,188	258			
Corrected Total	617,176	257			

a. R Squared = ,092 (Adjusted R Squared = ,081)

Custom Hypothesis Tests #1

Contrast Results (K Matrix)

Design Helmert Contrast			Dependent Variable
			PL
	Contrast Estimate		-,317
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-,317
Level 1 vs. Level 2	Std. Error		,185
	Sig.		,088
	95% Confidence Interval for Difference	Lower Bound	-,681
		Upper Bound	,048

Test Results

Dependent Variable: PL

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	6,459	1	6,459	2,928	,088
Error	560,376	254	2,206		

Custom Hypothesis Tests #2

Contrast Results (K Matrix)

Involvement Helmert Contrast			Dependent Variable
			PL
Level 1 vs. Level 2	Contrast Estimate		,889
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		,889
	Std. Error		,185
	Sig.		,000
	95% Confidence Interval for Difference	Lower Bound	,524
		Upper Bound	1,253

Test Results

Dependent Variable: PL

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	50,864	1	50,864	23,055	,000
Error	560,376	254	2,206		

1. Design

Dependent Variable: PL

Design	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Standard	3,175	,128	2,922	3,427
Co-Created	3,491	,133	3,229	3,754

2. Involvement

Dependent Variable: PL

Involvement	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Low Involvement	3,778	,131	3,520	4,035
High Involvement	2,889	,131	2,631	3,146

3. Design * Involvement

Dependent Variable: PL

Design	Involvement	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Standard	Low Involvement	3,592	,180	3,237	3,947
	High Involvement	2,758	,183	2,398	3,118
Co-Created	Low Involvement	3,963	,190	3,589	4,338
	High Involvement	3,020	,187	2,651	3,388

```
A n a l y s i s   o f   V a r i a n c e -- Design   1

 Tests of Significance for Purchase_Likelihood using UNIQUE sums of squares
 Source of Variation          SS       DF       MS        F  Sig of F

 WITHIN+RESIDUAL           566,84     255     2,22
 INVOLVEMENT WITHIN D       23,06       1    23,06     10,38      ,001
 ESIGN(1)
 INVOLVEMENT WITHIN D       27,27       1    27,27     12,27      ,001
 ESIGN(2)

 (Model)                    50,34       2    25,17     11,32      ,000
 (Total)                   617,18     257     2,40

 R-Squared =          ,082
 Adjusted R-Squared =  ,074
```

```
A n a l y s i s   o f   V a r i a n c e -- Design   2
 Tests of Significance for Purchase_Likelihood using UNIQUE sums of squares
 Source of Variation          SS       DF       MS        F  Sig of F

 WITHIN CELLS              560,38     254     2,21
 Design                     6,46       1     6,46      2,93      ,088
 Involvement               50,86       1    50,86     23,06      ,000
 Design BY Involvemen        ,19       1      ,19       ,09      ,769
 t

 (Model)                    56,80       3    18,93      8,58      ,000
 (Total)                   617,18     257     2,40

 R-Squared =          ,092
 Adjusted R-Squared =  ,081
```

116

Appendix 9. SPSS Output Hypothesis 7

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Overall_Risk

F	df1	df2	Sig.
,434	3	256	,729

Tests the null hypothesis that the error variance of the

dependent variable is equal across groups.

a. Design: Intercept + Design * Firm + Firm + Design

Tests of Between-Subjects Effects

Dependent Variable: Overall_Risk

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	10,000[a]	3	3,333	1,547	,203
Intercept	2685,723	1	2685,723	1246,511	,000
Design * Firm	,465	1	,465	,216	,642
Firm	7,973	1	7,973	3,700	,056
Design	1,722	1	1,722	,799	,372
Error	551,576	256	2,155		
Total	3250,731	260			
Corrected Total	561,576	259			

a. R Squared = ,018 (Adjusted R Squared = ,006)

Estimated Marginal Means

1. Design * Firm

Dependent Variable: Overall_Risk

Design	Firm	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Standard	Unknown	3,268	,177	2,920	3,616
	Known	3,002	,181	2,647	3,358
Co-Created	Unknown	3,516	,185	3,152	3,880
	Known	3,081	,186	2,714	3,448

2. Firm

Dependent Variable: Overall_Risk

Firm	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Unknown	3,392	,128	3,140	3,644
Known	3,042	,130	2,786	3,297

3. Design

Dependent Variable: Overall_Risk

Design	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Standard	3,135	,126	2,886	3,384
Co-Created	3,298	,131	3,040	3,557

Appendix 10. SPSS Output Additional Analysis

Financial Risk

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Financial_Risk

F	df1	df2	Sig.
,345	7	251	,933

Tests the null hypothesis that the error variance
of the dependent variable is equal across groups.
a. Design: Intercept + Design + Brand + Design *
Brand

Tests of Between-Subjects Effects

Dependent Variable: Financial_Risk

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	29,142[a]	7	4,163	1,910	,068
Intercept	3689,641	1	3689,641	1692,333	,000
Design	,002	1	,002	,001	,979
Brand	24,847	3	8,282	3,799	,011
Design * Brand	5,129	3	1,710	,784	,504
Error	547,233	251	2,180		
Total	4284,483	259			
Corrected Total	576,375	258			

a. R Squared = ,051 (Adjusted R Squared = ,024)

1. Design

Dependent Variable: Financial_Risk

Design	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Standard	3,777	,127	3,526	4,027
Co-Created	3,782	,133	3,520	4,043

2. Brand

Dependent Variable: Financial_Risk

Brand	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Lay's	3,582	,183	3,220	3,943
Crisp	3,446	,185	3,082	3,810
Dell	3,836	,186	3,470	4,202
Chip	4,253	,181	3,898	4,609

3. Brand * Design

Dependent Variable: Financial_Risk

Brand	Design	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Lay's	Standard	3,755	,253	3,256	4,253
	Co-Created	3,408	,265	2,886	3,931
Crisp	Standard	3,481	,253	2,982	3,980
	Co-Created	3,411	,270	2,880	3,942
Dell	Standard	3,834	,261	3,320	4,348
	Co-Created	3,838	,265	3,316	4,361
Chip	Standard	4,038	,250	3,546	4,529
	Co-Created	4,469	,261	3,955	4,983

Dear respondent,

First of all I would like to introduce my self. I am Mahrou Kharazi, master student Economics and Business at the Erasmus University in Rotterdam. This survey is part of the research for completing my master thesis.

I am very grateful for your participation in this survey. Fulfilling this questionnaire will take about 15 minutes. All information provided by you will be anonymous. However, your answers are extremely important for my research. Try to answer as correctly as possible, given your own interpretation.

To show my gratitude at the end of this survey you will find a discount code for a purchase on www.horlogewinkel.nl. Among the participants there will be a lottery where you can win an original Ice Watch. In order to participate in the lottery, leave your email address at the end of the survey, when asked for.

If you have any questions, please send an email to 305477mk@student.eur.nl.

Thank you very much.
Kind regards,

Mahrou Kharazi

This survey will examine the differences in perception between traditional products and co-created products. Co-created products, are products that are made by the company with help of customers. Customers can help in various ways. Some examples in which customers can co-create are by contributing to the choice of ingredients, new flavors and new model designs. The survey is divided into two sections. Each section will ask questons about 1 product.

If you wish to see an example of co-creation, watch this video. The video shows a co-creation initiative of Heineken, where design is outsourced to consumers.

Have you ever participated in co-creation (contributing to designs of companies or participating on open platforms)

○ No, I have never participated

○ I am not sure, I cannot recall.

○ Yes, I have participated/ participate on the Lay's Super Fans platform

○ Yes, I have participated/participate on the Dell platform

○ Yes, I have participated in the ESE innovation tournament of Erasmus School of Economics

○ Yes, I have participated/participate for another company, on another platform. The name of the company is;

For each of the statements, please chose the option that best describes your feelings.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
If I needed a bag of chips, I believe I would be satisfied with a bag of chips that is co-created (produced based on ideas from consumers).	○	○	○	○	○	○	○
Overall, in purchasing a bag of chips, I believe that I would be pleased with a co-created bag of chips (produced based on ideas from consumers).	○	○	○	○	○	○	○
I believe that purchasing a bag of chips that is co-created (produced based on ideas from consumers) is usually a satisfying experience.	○	○	○	○	○	○	○

For each of the statements, please chose the option that best describes your feelings.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
If I needed a laptop, I believe I would be satisfied with a laptop that is co-created (produced based on ideas from consumers).	○	○	○	○	○	○	○
Overall, in purchasing a laptop, I believe that I would be pleased with a co-created laptop (produced based on ideas from consumers)	○	○	○	○	○	○	○
I believe that purchasing a laptop that is co-created (produced based on ideas from consumers)is usually a satisfying experience.	○	○	○	○	○	○	○

In this survey you will be asked to imagine you are purchasing a bag of chips. Please answer the following questions regarding the purchase of a bag of chips for your personal situation.

If you were making this decision, how important would this decision be for you?

Not at all Important	Very Unimportant	Somewhat Unimportant	Neither Important nor Unimportant	Somewhat Important	Very Important	Extremely Important
○	○	○	○	○	○	○

How concerned would you be about making the best selection if you were making this decision in real life?

Not at all Concerned	Very Unconcerned	Somewhat Unconcerned	Neither Concerned nor Unoncerned	Somewhat Concerned	Very Concerned	Extremely Concerned
○	○	○	○	○	○	○

This purchasing situation is relevant to me.

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

In this survey you will be asked to imagine you are purchasing a laptop. Please answer the following questions regarding the purchase of a laptop for your personal use.

If you were making this decision, how important would this decision be for you?

Not at all Important	Very Unimportant	Somewhat Unimportant	Neither Important nor Unimportant	Somewhat Important	Very Important	Extremely Important
○	○	○	○	○	○	○

How concerned would you be about making the best selection if you were making this decision in real life?

Not at all Concerned	Very Unconcerned	Somewhat Unconcerned	Neither Concerned nor Unoncerned	Somewhat Concerned	Very Concerned	Extremely Concerned
○	○	○	○	○	○	○

This purchasing situation is relevant to me

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
○	○	○	○	○	○	○

The company Crisp is a new company, unkown by many people. Crisp has started since January 2012. The products that Crisp produces are chips.Crisp has introduced a new series of chips flavors called Deep Ridged. Deep Ridged chips are designed and produced by company professionals of Crisp. This bag of chips is traditionally manufactured (idea generation, launch, and design are all done by Crisp professionals) and is NOT co-created.

For the questions following, keep in mind the Deep Ridged bag of chips from the new company Crisp.

Our Crisp professionals have found that special taste.

Especially for you. Offering the crunchiest tastiest chips you have ever tried!

In your opinion, how high is the design expertise of the people designing for this company?

○ They have very low designer expertise

○ They have low designer expertise

○ They have somewhat low designer expertise

○ The designer expertise are perceived as neutral

○ They have somewhat high designer expertise

○ They have high designer expertise

○ They have very high designer expertise

Do you think that the people designing for this company have the necessary skills (know-how) and competence to design new products?

○ They don't have the necessary skills.

○ They have little necessary skills

○ They have some of the necessary skills

○ They have quite a bit of the necessary skills

○ They have a substantial amount of the necessary skills

○ They have an extreme amount of the necessary skills

○ They have all the necessary skills

For each of the statements, please choose the option that best describes your feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Overall, the thought of buying the Crisp chips within the next 12 months causes me to be concerned with experiencing some kind of loss if I went ahead with the purchase.	○	○	○	○	○	○	○
All things considered, I think I would be making a mistake if I bought the bag of Crisp chips, within the next 12 months for my self.	○	○	○	○	○	○	○
When all is said and done, I really feel that the purchase of this bag of Crisp chips within the next 12 months poses problems for me that I just don't need	○	○	○	○	○	○	○

For each of the statements, please choose the option that best describes your feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
You are suspicious of the quality of this bag of Crisp chips.	○	○	○	○	○	○	○
You are afraid that the taste of the Crisp chips will not be as good as you expected it to be.	○	○	○	○	○	○	○
You are suspicious of the ingredients used in this bag of Crisp chips.	○	○	○	○	○	○	○
You think that this bag of Crisp chips will not be good.	○	○	○	○	○	○	○

For each of the statements, please choose the option that best describes your feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
You think that buying this bag of Crisp chips is a waste of money.	○	○	○	○	○	○	○
You are worried that this bag of Crisp chips is not worth the money spent.	○	○	○	○	○	○	○
You think that buying this bag of Crisp chips is not a wise way to spend money.	○	○	○	○	○	○	○

<u>Please imagine that you would like to buy the bag of Crisp Deep Ridged chips from the picture.</u>

The maximum amount (in euros) I would be willing to pay for this bag of Crisp chips is

○ 0-0,49 euro

○ 0,50-0,99 euro

○ 1,00-1,49

○ 1,50-1,99 euro

○ 2,00-2,49

○ 2,50-2,99 euro

○ More than 2,99 euro

The average retail price for this bag of Crisp chips is 1.29 euro. How probable is it that you would buy this bag of Crisp chips?

Very Improbable	Improbable	Somewhat Improbable	Neither Improbable nor Probable	Somewhat Probable	Probable	Very Probable
○	○	○	○	○	○	○

Choose the option that best fits your personal feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I would seriously consider purchasing this bag of Crisp chips.	○	○	○	○	○	○	○
I would actively search for this bag of Crisp chips.	○	○	○	○	○	○	○

Choose the option that best fits your personal feeling. To me purchasing this bag of Crisp chips is

Very Unlikely	Unlikely	Somewhat Unlikely	Undecided	Somewhat Likely	Likely	Very Likely
○	○	○	○	○	○	○

Choose the option that best fits your personal feeling. To me purchasing this bag of Crisp chips is

Very Improbable	Improbable	Somewhat Improbable	Neither Improbable nor Probable	Somewhat Probable	Probable	Very Probable
○	○	○	○	○	○	○

A very close friend of you tells you the following about the Deep Ridge chips from the company Crisp;

"The new product-line Deep Ridge of Crisp is absolutely fantastic! I have tried it and I love it. The taste is great! So much better than the previous available chips. The deep ridges make them more crunchy and fun to eat. It just adds that little extra. The potatoes that they use for this chips are very fresh. I am certain that you will love Deep Ridge chips from Crisp too. You should really try it!"

Answer the following questions based on this recommendation of your very close friend.

Please choose the degree to which you agree or disagree with the statements, based on the recommendation of your very close friend.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
This person provided little new information.	○	○	○	○	○	○	○
The opinion of this person will influence my choice about buying the product.	○	○	○	○	○	○	○
This person mentioned some things I had not considered.	○	○	○	○	○	○	○
This person provided some different ideas than other sources.	○	○	○	○	○	○	○
This person really did NOT change my mind about buying the product.	○	○	○	○	○	○	○
This person helped me make a decision about buying the product.	○	○	○	○	○	○	○

Choose the option that best fits your personal feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I would seriously consider purchasing this bag of Crisp chips.	○	○	○	○	○	○	○
I would actively search for this bag of Crisp chips.	○	○	○	○	○	○	○

Choose the option that best fits your personal feeling. To me purchasing this bag of Crisp chips is

Very Unlikely	Unlikely	Somewhat Unlikely	Undecided	Somewhat Likely	Likely	Very Likely
○	○	○	○	○	○	○

Choose the option that best fits your personal feeling. To me purchasing this bag of Crisp chips is

Very Improbable	Improbable	Somewhat Improbable	Neither Improbable nor Probable	Somewhat Probable	Probable	Very Probable
○	○	○	○	○	○	○

The following questions will be about the company Dell, producer of computers and laptops.

Please describe your feelings about the brand Dell.

Very Bad	Bad	Poor	Neither Good nor Bad	Fair	Good	Very Good
○	○	○	○	○	○	○

Please describe your feelings about the brand Dell.

Dislike Extremely	Dislike Very Much	Dislike Slightly	Neither Like nor Dislike	Like Slightly	Like Very Much	Like Extremely
○	○	○	○	○	○	○

Please describe your feelings about the brand Dell.

Extremely Unfavorable	Very Much Unfavorable	Slightly Unfavorable	Neither Favorable nor Unfavorable	Slightly Favorable	Very Much Favorable	Extremely Favorable
○	○	○	○	○	○	○

Please describe your feelings about the brand Dell.

Extremely Unappealing	Very Much Unappealing	Slightly Unappealing	Neither Appealing nor Unappealing	Slightly Appealing	Very Much Appealing	Extremely Appealing
○	○	○	○	○	○	○

Please describe your feelings about the brand Dell.

Extremely Unpleasant	Very Much Unpleasant	Slightly Unpleasant	Neither Pleasant nor Unpleasant	Slightly Pleasant	Very Much Pleasant	Extremely Pleasant
○	○	○	○	○	○	○

Dell has launched a new serie of laptops. The ideas for these laptops of Dell, the design and the attributes are made and decided up on with consumers. Dell has a platform where consumers can vote and innovate. These laptops of Dell are co-created.

After subscription on the website of Dell, you can enter the innovation platform. On this platform you can participate in discussions, give recommendations, propose new laptop models and attributes and vote on suggestions of others. If the idea of a consumer is chosen and produced, that consumer will get a percentage of the sales of that product.

The next questions will be about the co-created laptops of Dell.

In your opinion, how high is the design expertise of the people designing for this company?

- ○ They have very low designer expertise
- ○ They have low designer expertise
- ○ They have somewhat low designer expertise
- ○ The designer expertise are perceived as neutral
- ○ They have somewhat high designer expertise
- ○ They have high designer expertise
- ○ They have very high designer expertise

Do you think that the people designing for this company have the necessary skills (know-how) and competence to design new products?

- ○ They don't have the necessary skills.
- ○ They have little necessary skills
- ○ They have some of the necessary skills
- ○ They have quite a bit of the necessary skills
- ○ They have a substantial amount of the necessary skills
- ○ They have an extreme amount of the necessary skills
- ○ They have all the necessary skills

For each of the statements, please choose the option that best describes your feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
Overall, the thought of buying the co-created Dell laptop within the next 12 months causes me to be concerned with experiencing some kind of loss if I went ahead with the purchase.	○	○	○	○	○	○	○
All things considered, I think I would be making a mistake if I bought the co-created Dell laptop, within the next 12 months for my self.	○	○	○	○	○	○	○
When all is said and done, I really feel that the purchase of the co-created Dell laptop within the next 12 months poses problems for me that I just don't need	○	○	○	○	○	○	○

For each of the statements, please choose the option that best describes your feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
You are suspicious of the quality of the co-created Dell laptop.	○	○	○	○	○	○	○
You are afraid that the functionality of the co-created Dell laptop will not be as good as you expected it to be.	○	○	○	○	○	○	○
You are suspicious of the materials used in the co-created Dell laptop.	○	○	○	○	○	○	○
You think that this co-created Dell laptop will not be good.	○	○	○	○	○	○	○

For each of the statements, please choose the option that best describes your feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
You think that buying this co-created Dell laptop is a waste of money.	○	○	○	○	○	○	○
You are worried that the co-created Dell laptop is not worth the money spent.	○	○	○	○	○	○	○
You think that buying this co-created Dell laptop is not a wise way to spend money.	○	○	○	○	○	○	○

Please imagine that you would like to buy the co-created Dell laptop.

The maximum amount (in euros) I would be willing to pay for this co-created Dell laptop is
- ○ 0-149 euro
- ○ 150-299 euro
- ○ 300-449 euro
- ○ 450-599 euro
- ○ 600-749 euro
- ○ 750- 899 euro
- ○ More than 899 euro

The average retail price for this co-created Dell laptop is 650 euro. How probable is it that you would buy this Dell laptop?

Very Improbable	Improbable	Somewhat Improbable	Neither Improbable nor Probable	Somewhat Probable	Probable	Very Probable
○	○	○	○	○	○	○

Choose the option that best fits your personal feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I would seriously consider purchasing this co-created Dell laptop.	○	○	○	○	○	○	○
I would actively search for this co-created Dell laptop.	○	○	○	○	○	○	○

Choose the option that best fits your personal feeling. To me purchasing the co-created Dell laptop is

Very Unlikely	Unlikely	Somewhat Unlikely	Undecided	Somewhat Likely	Likely	Very Likely
○	○	○	○	○	○	○

Choose the option that best fits your personal feeling. To me purchasing the co-created Dell laptop is

Very Improbable	Improbable	Somewhat Improbable	Neither Improbable nor Probable	Somewhat Probable	Probable	Very Probable
○	○	○	○	○	○	○

A very close friend of you participated in the co-creation of a laptop from Dell (He/she made an account on their website and actively participated in the design and the innovation process, which led to the new laptop of Dell).

Your close friend tells you the following about the co-created Dell laptop;

"This Dell laptop is absolutely fantastic! I have participated in the production of this laptop and I love how it turned out to be. They functionality is so great, so much better than the current available laptops in the market. The Dell laptop has a wonderfull harddrive and is very stylish. I have one and it is perfect. You should really get this Dell laptop too. I am certain that you will love it!

Answer the following questions based on this recommendation of your very close friend.

Please choose the degree to which you agree or disagree with the statements, based on the recommendation of your very close friend.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
This person provided little new information.	○	○	○	○	○	○	○
The opinion of this person will influence my choice about buying the product.	○	○	○	○	○	○	○
This person mentioned some things I had not considered.	○	○	○	○	○	○	○
This person provided some different ideas than other sources.	○	○	○	○	○	○	○
This person really did NOT change my mind about buying the product.	○	○	○	○	○	○	○
This person helped me make a decision about buying the product.	○	○	○	○	○	○	○

Choose the option that best fits your personal feeling.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I would seriously consider purchasing this co-created Dell laptop.	○	○	○	○	○	○	○
I would actively search for this co-created Dell laptop.	○	○	○	○	○	○	○

135

Choose the option that best fits your personal feeling. To me purchasing this co-created Dell laptop is

Very Unlikely	Unlikely	Somewhat Unlikely	Undecided	Somewhat Likely	Likely	Very Likely
○	○	○	○	○	○	○

Choose the option that best fits your personal feeling. To me purchasing this co-created Dell laptop is

Very Improbable	Improbable	Somewhat Improbable	Neither Improbable nor Probable	Somewhat Probable	Probable	Very Probable
○	○	○	○	○	○	○

For each of the statements, please choose the option that best describes your feelings.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
If I needed a laptop, I believe I would be satisfied with the co-created Dell laptop.	○	○	○	○	○	○	○
Overall, in purchasing a laptop, I believe that I would be pleased with the co-created Dell laptop.	○	○	○	○	○	○	○
I believe that purchasing a co-created laptop from Dell is usually a satisfying experience.	○	○	○	○	○	○	○

Please indicate your gender and age.

Gender

○ Male

○ Female

Age

[   ]

136

You have almost come to the end of the survey. Thank you very much for participating. If you have any questions please contact me by email 305477mk@student.eur.nl

As promised you will be receiving a promotion code for a purchase on www.horlogewinkel.nl . When checking out at the website, use the promotional code; ROBERT10
This code will give you 10% discount on your purchase.

To show my gratitude for your time investment, one randomly selected participant will receive an Ice Watch. If you are selected you can chose a Unisex model in the color of your choice (see picture below).

○ No, I do not want to participate.

○ Yes, I would like to participate. My email adress is;

Appendix 12. Lottery Winner

M.C. de Jong participated in the survey and trough random selection won an Ice Watch of his choosing.

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