

Co-creation of value from a service constellation perspective

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ABSTRACT

In the 21st century, the process of value creation is rapidly shifting from a firm-centric to a customer-centric view. Understanding the locus of personalized customer experiences is becoming extremely important for creating customer value and organizational success (Prahalad & Ramaswamy, 2004). This paper uses the service-dominant logic (Vargo & Lusch, 2004) to explain the meaning of value and the process of value creation from a service constellation perspective. This research stresses the need for businesses to focus on the unique value propositions of service constellations, and the ability it provides businesses to co-create value with their customers, by creating engaged customers.

This study finds that the unique value propositions of service constellations stimulate customers to get engaged with the firm by not only enhancing customer value, but also by shaping the dynamic field for customer-brand relationship building. Results showed that the degree to which a customer perceived a service as part of a larger constellation had a significant positive effect on the customer's engagement behavior towards a firm. Moreover, customer brand love was found to have a positive moderating effect on this relationship. The emotional connection a customer had with a brand had a positive influence on the relationship between the customer's perceived degree of service constellation and resulting engagement behavior.

PREFACE

This master thesis is written for the completion of the master's specialization Innovation & Entrepreneurship at the Radboud University Nijmegen. This master is a specialization following the bachelor's programme in Business Administration. The master's specialization in Innovation and Entrepreneurship provides the skills and knowledge to understand the challenges that entrepreneurs nowadays face in their businesses. In a rapidly changing environment, businesses need to evolve and continuously adapt to new challenges. The master combines innovation management and entrepreneurship. This thesis focuses on innovation management. Innovation management allows an organization to respond to internal or external opportunities and uses its creativity to introduce new processes, products or services. With the customer becoming more demanding each day, firms need to find new ways to distinguish themselves from competitors. One firm that always has been extremely successful in doing so is Apple. Apple is known for selling extremely well-designed products, while simultaneously making things simple for their audience. This customer-oriented approach was vital for their organizational success.

I have always found Apple inspiring. I found it fascinating how their products revolutionized the market. For example, the introduction of the iMac, the iPod, the iPhone or the iPad. Apple changed the world not once, but multiple times. I never really understood how they did it, what it was that made their products so good. Once I learned about the art of building service constellations in service innovation, I did. All the Apple products and services operate together. These products allow customers to integrate different products/services with each other, resulting in synergetic benefits. In the 21st century, firms in search of competitive advantage need to understand that the value creation process of a service is always interdependent on other services. Apple was the first, and one of few, who did.

However, it came to my attention that the current scientific literature rarely addresses this topic. Therefore, I decided to explore the manner in which customers use and experience services, how they value a service within the context of a service constellation and its implications for service innovation and innovation management. Needless to say, Apple was extremely helpful in writing my thesis. Although it sometimes was a very frustrating and surprisingly complicated route, I am very excited and even proud of the result. With that said, I would like to take the opportunity to thank my supervisors Allard van Riel and Robert Kok, for all the help and support during this process.

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1. INTRODUCTION

1.1 The changing market of the 21st century

In the 20th century, the word ‘market’ was associated with a distinct image; it was the point of exchange where a firm trades goods and services with customers. Implicit in this view is a critical assumption that firms can act autonomously in designing products and developing production processes (Prahalad & Ramaswamy, 2004). Firms did not encounter interference from or interaction with their customers. In the traditional conceptualization of the process of value creation, customers were ‘outside the firm’. Value creation occurred inside the firm through its internal activities. The concept of the ‘value chain’ centered the pivotal role of the firm in creating value (Porter, 1980). The customer and the firm had different, mutually exclusive roles of respectively consumption and production (Kotler, 2002). In this perspective, the market and customer were separated from each other in the value creation process. According to Kotler (2002), the customer had no role in value creation. Therefore, the traditional concept of a market and the process of value creation were firm-centric.

However, customers are increasingly learning that they too can (co-)create value and that they are no longer solely dependent on the supplier (Vargo & Lusch, 2004). Based on their own views of how value should be created, customers can now choose the firms they want to have a relationship with. Prahalad and Ramaswamy (2004, p. 7): *“Customers are becoming more knowledgeable and increasingly aware of their negotiating clout and continuously more businesses feel the pressure to adopt an (implicit) negotiation strategy. We are moving towards a world in which value is the result of a negotiation process between the customer and the firm”*.

The consequences of not recognizing this shift can be fatal for firms. As long as firms believe that the customer can be separated from the value creation process, firms in search of competitive advantage will have no choice but to squeeze costs from their ‘value chain’ activities as much as possible. Meanwhile, globalization, deregulation, outsourcing, and the fast-paced development of technology are making it much harder for companies to differentiate their offerings (Prahalad & Ramaswamy, 2004). The result? Firms continue to reduce costs, leading towards price erosion, yet customers can ignore these cost reductions due to their increased bargaining position. According to Prahalad and Ramaswamy (2004), the solution to this dilemma is simple; firms must escape the outdated firm-centric view. They

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can do so by adopting a customer perspective to business operations and focusing on personalized interactions between the customer and the business. Prahalad and Ramaswamy (2004, p. 6): “*Customers now seek to exercise their influence in every part of the business system. Armed with new tools and dissatisfied with available choices, customers want to interact with firms and thereby ‘co-create’ value. The changing nature of the customer-company relationship redefines the meaning of value and the process of value creation within organizations*”.

Nowadays, value creation is based on interdependency between the firm and the customer, resulting in co-creation of value. Co-creation of value is a far developed business strategy that focuses on customer experiences and emphasizes the need for interactive relationships between customers and suppliers. Co-creation allows and encourages a more active involvement from customers in product development and innovation management, in order to enrich the value experience (Vargo & Lusch, 2004). Co-creation is not just delivering good products or the firm trying to please the customer, it is not ‘the customer is always right’ or ‘the customer is king’. It is about *joint* problem definition and problem solving

In the marketing and innovation literature, the creation of value is regarded as the core objective of economic exchange (Woodruff, 1997). Firms offer value propositions in the form of products or services and customers experience value when they use those services (Vargo & Lusch, 2004). On this note, there is another shift in the business environment worth mentioning. Due to the enhanced customer negotiation clout, businesses are experiencing crucial shifts in percent revenue derived from services. Where in the early and mid-90’s a company’s main concern was to deliver good products with low manufacturing costs, nowadays service management is gaining importance. This idea was introduced by Vargo and Lusch (2004). The authors stated that the ‘dominant logic’ in value creation used to merely focus on tangible resources, but nowadays shifts to the so-called ‘service-dominant logic’ (S-D logic). The S-D logic focuses on intangible resources, the co-creation of value and relationships between customers and firms. The authors believe that these new perspectives are converging into a new dominant logic for value creation and innovation management, one in which services rather than goods are fundamental to economic exchange. Hence, Spohrer and Maglio (2008) urge the need for quality service innovations to further fuel economic and organizational growth.

A rapidly emerging trend within the service field and service innovation is the art of building service constellations. Van Riel et al. (2013, p.4) state the following about service constellations: “*Customers increasingly experience and value services as elements of a larger*

constellation of mutually facilitating, complementary, and supporting services. Customers integrate the resources offered by the constellation. The authors take the Apple iPad as an example. The iPad provides value for customers through its operating systems and hardware. However, the iPad also creates value through the (third party) application providers. The applications make the hardware and operating systems valuable. The combination of the apps and the operating systems generate complementary value and synergetic benefits to the customer. Concluding, the value customers associate with using one service depends on the value that can be derived from using other services that somehow support, complement and facilitate that initial service (Van Riel et al., 2013).

However, it remains a difficult task for companies to effectively organize service constellations, because there are many actors (being it customers or other organizations) in the ecosystem to consider, each with different, and sometimes-conflicting, agendas. Furthermore, Cooper et al. (1999), McNally et al. (2009) and Schilling and Hill (1998) explain the difficulties in designing service constellations. They illustrate that realizing changes or improvements to an individual service may have severe consequences for the value creation (potential) of other services, and so for other organizations, within the ecosystem. Contradictorily, those changes can also create new forms of value that would not have occurred when focusing on their own individual services. In other words, recognizing and mastering the complexity of service constellations creates the potential to provide additional value (Van Riel et al., 2013).

These changes in the business environment, as described above, may require us to reshape our understanding of the functioning of organizations while pursuing competitive advantage. How organizations can create value and use customers during this process. The traditional system of company-centric value creation, which has served so well over the past 100 years, is becoming obsolete. In the emergent economy, competition needs to center on personalized co-creation experiences, resulting in value that is unique to each individual (Prahalad & Ramaswamy, 2004). Customers no longer fulfill a silent role within the market and they do not solely judge a company based on its product or price anymore. These days, the service and according service constellations provided by companies are perceived as equally, if not more, important by customers.

In academic and scientific literature, much has been said about these changes. It has been researched extensively how a customer-centered instead of company-centered view is the way to achieve competitive advantage and how value creation and relationship building between customers and companies has evolved over the years (Vargo & Lusch, 2004;

Prahalad & Ramaswamy, 2004). Moreover, the role of customers in co-creating value within organizations has been identified in multiple, but different segments. The distinguishing feature of the new marketplace is that customers become a new source of competence for the corporation. Therefore, involving (potential) customers in new product or service development has been a very popular topic in marketing and innovation literature as well. Prior research has established widely that involving customers more actively in new product development increases the likelihood of product success and organizational success (Hoyer et al., 2010). Furthermore, Matthing et al. (2004) explain that new service development depends on understanding the complex task of anticipating latent customer needs.

While specifically looking at service constellations, prior research mainly focuses on service constellations as a tool for developing organizational strategy and innovativeness (Jones et al., 1998; Van Riel et al., 2013). Van Riel et al. (2013) illustrate how service innovation based on a constellation perspective requires coordination and synchronization between projects and different approaches to portfolio management. Jones et al. (1998) examine the multi-actor tensions, which obligate firms to make strategic choices to focus on either individual or collective advantage, within service constellations. However, very limited research addresses the facilitation of service constellation as a tool for creating organizational and customer value and especially the integration of customers in this process is an undiscovered area.

1.2 Problem orientation and research question

In order to fill this gap in scientific literature, this dissertation concentrates on customer involvement in the process of value creation within businesses part of service constellation¹ and adopts a customer perspective² to the creation and existence of service constellations. This study explores the manner in which customers use and experience services and how they value a service within the context of a service constellation. Therefore, this study investigates how customers construct their behavior towards businesses and how their attitudes and mental processes (their mindset) towards the business, its services and according constellations influence this process. However, the academic literature has never

¹ Businesses adopting a constellation perspective to their business operations by providing services as part of (within) a larger constellation.

² A customer perspective to service constellations explores the manner in which customers use, experience and value services within the context of a service constellation.

addressed customer behavior from a service constellation perspective. Hence, the following problem statement can be formulated:

- **Problem statement:** *There is a lack of scientific insights on what degree perceived service constellation³, and under what conditions, influences customers' engagement behavior.*

This study uses service constellations as a tool for organizations to improve and innovate their products and services through achieving co-creation of value. Companies can use customer service (constellation) experiences to optimize and/or restructure their innovation strategies. A customer-oriented approach towards service constellations allows businesses to design and structure their innovation processes in such a way that those innovations better succeed in what they actually should, namely creating *engaged* customers. Customers who are committed to the organization and the way it operates, loyal customers who support the company and are motivated to help the company grow, customers who are willing to engage with a firm to improve current and co-create new products or services.

According to prior research from Jaakkola and Alexander (2014), Van Doorn et al. (2010) and Vivek et al. (2012), creating customer engagement is key to achieving co-creation of value, because customer engagement empowers a firm to work with and learn from their customers: *“Customer engagement is the vital component of relationship making between customers and firms and it provides the opportunity for organizations to learn from their customers”* (Vivek et al., 2012, p. 130). Engaged customers are customers who reflect and provide feedback on a firm's offerings (Van Doorn et al., 2010). Customer feedback is critical for organizational success as it guides organizations in process, product or service innovation and capacitates organization learning. Customer engagement is therefore an important desirable outcome of all innovation strategies and innovation management.

Nevertheless, creating engaged customers remains a difficult task for most of the business environment. Customers do not become engaged easily, because they need to feel that the business is worth their time, effort and energy and that they are getting something in return. Prior findings from Van Doorn et al. (2010) and Vargo and Lusch (2004) illustrate that the customer's mindset towards engagement behavior is primarily based upon two

³ The degree to which a customer perceives a service as part of a larger constellation, which allows the customer to integrate different services within that constellation, resulting in complementary and supportive benefits.

dimensions: a functional and emotional dimension. These dimensions emerged from two underlying concepts: *value creation* and *brand perception*.

First of all, the value a customer expects to derive from a firm is a core driver for customer engagement behavior (Van Doorn et al., 2010; Vivek et al., 2012). Value creation is, or is ought to be, something easily expressed. The customer's evaluation of the value creation abilities of a product or service is therefore rapidly established. Based on the expectation of a product's functional capabilities (e.g., price, quality, time-consumption) compared to its actual outcome, customers determine their satisfaction with the product. Vargo and Lusch (2004) state that value is created by the firm's competence to effectively focus on internal processes and systems and their functionality, but also by the companies' mindset and culture. The mindset and culture within a business must revolve around creating customer value. Suppliers need to comprehend the customer value concept; what a customer perceives as valuable, how customers' value needs change of time and additionally, how service constellations play a vital role in providing distinctive customer value. Likewise, suppliers need to understand the importance of gaining customer feedback in order to create customer value. Needless to say, understanding customer needs, what goes on in customers' minds when they buy or use a certain product, generates strategic insights in purchasing behavior and decision-making of customers. Once firms capture and exploit the process of value creation correctly, they can make the customer want to come back for more, resulting in reduced errors, customer loyalty and ultimately customer engagement.

Secondly, with many products and services today meeting expectations and requirements regarding their *functional* qualities, companies must also develop strategies and tools in order to create engaged customers by triggering more *emotional* service experiences (Van Doorn et al., 2010; Gummerus & Pihlström, 2011; Sandström et al., 2008). In order to create emotional connections with customers, firms intensively focus on establishing positive brand image in customers' minds (Zhang, 2015). In the increasingly competitive marketplace, companies need to have a broader understanding of customer behavior and must not merely focus on functional attributes, the value creation process, of their service systems. Suppliers must educate customers about their brand in order to develop co-creation strategies (Schau et al., 2009).

For example, the success of electronics giant Apple is partly due to Apple's brand equity and its community. The Apple community is filled with people who are motivated to help the company grow. From all over the world people continuously talk about Apple products and discuss how to use and improve them. Apple triggers emotional connections

with people through their products, which makes their brand equity so strong. People in the Apple community do not just ‘like’ Apple, they ‘love’ Apple. This ‘brand love’ is a much further developed concept in customers’ minds than brand *image*. Brand love is an intensive attachment a customer has to a particular brand, which arises from a deeply rooted emotional connection with the brand. Brand love reflects the customer’s proclivity to include important brands as part of how they view themselves and heavily influences customers’ behavior towards a firm. Brand image is considered to be something easily replaceable. Brand love, on the other hand, is ought to be more stubborn and tenacious (Batra et al., 2012).

A perfect example to clarify the distinction between these two concepts and their effects on customer behavior is the ‘switching behavior’ of Apple-users; the chance of Apple-users abandoning Apple products in favor of a competitor. The switching behavior of Apple-users is very low compared to its competitors; people often switch *to* an iPhone, but not the other way around (Visual Cinnamon, 2014; Batra et al., 2012). Apple products do not only attract their *existing* customers, but also people *outside* their customer base. People who bought electronic products somewhere else or did not even buy these electronic devices at all, suddenly desire Apple products and connect with its brand. Furthermore, Apple’s brand equity is so high that it has almost become immune to bad or negative news, which is certainly not the case for its main competitor Samsung. A brand that had an extremely good image and loyal customers, but once news spread about the flammable Galaxy Note, it’s brand equity and customer trust drastically dropped. Something that many people doubt would have happened to Apple (Visual Cinnamon, 2014).

Therefore, this study states that assessing the emotional dimension of a customer’s mindset through brand *perception* or brand *image* fall short. In order to create engaged customers, firms must focus on creating brand *love*. Concluding, this dissertation explores how customers’ perceived service constellation (PSC) influences their engagement behavior and investigates in what way customers’ emotional brand connection (brand love) affects this process. As a result, the following research question and sub questions are formulated:

- **Research question:** *What is the effect of perceived service constellation on customer engagement behavior, while taking the customer’s brand love into account?*

- **Sub question 1:** *What effect does perceived service constellation have on customer engagement behavior?*

- *Sub question 2: What effect does customer brand love have on customer engagement behavior in case of a constellation of services?*

1.3 Relevance and contribution

This research is scientifically relevant as it tries to extend the existing literature and service science by contributing to the current knowledge about service constellations and the use of customers within them. This research argues that adopting a service constellation perspective to business operations has far-reaching consequences for the innovation process, but many of these consequences have not been investigated or discussed in detail in the scientific literature. This study builds on existing theories explaining value creation in service constellations based on interdependency between the firm and the customer (customer-centric view) and the service-dominant logic.

Nevertheless, the current literature regarding the development of service constellations is very limited, and mainly focuses on service constellations as a tool for developing organizational strategy and innovativeness, but does not entail how customers can create value in this process. By providing more detailed insights on customers' engagement behavior towards firms, this thesis could also be very relevant for the managerial practice, because it entails how customers can be (used as) an asset for managers and organizations. A lot of managers still face problems with effectively designing their innovation strategies, because the current market is highly competitive, dynamic and continuously changing. Hence, around half of the world's innovations fail (Klein & Knight, 2005). Despite all the efforts in market research and money spend on R&D, it remains hard for managers to find out what the people want.

By gathering more information about customer engagement within service constellations, how value creation and brand love play a role in this process, managers will get a better understanding of the mental processes of customers and what triggers them to connect with the business. Once businesses establish customers to engage, they can work and learn with them by sharing knowledge and experiences about the companies' products and services. In that way, customers get involved with the venture, as they become co-producers. Managers can use customers to improve their service systems, innovations strategies and according implementation, which will eventually open the doors for co-creation of value.

1.4 Approach

In order to answer the research question, this study will be of a quantitative nature. This dissertation tries to conduct regularities on the relationship between service constellations and customer behavior, and uses the numerical testing of hypotheses regarding perceived service constellation, customer brand love and engagement behavior, to do so. Furthermore, a field experiment will be used as research design. In combination with a questionnaire regarding a service constellation of two hypothetical Smartphone brands, this study seeks to frame the influence of the customers' perceived service constellation and brand love to the importance of the customer's engagement behavior.

This thesis consists of six chapters. In the next chapter, the assumptions and conceptual model of this research are developed. Chapter 3 further elaborates on the methodology and research design. Subsequently, in Chapter 4 and 5 the data is statistically analyzed and Chapter 6 discusses the results of the study. The last chapter presents a short summary of the study and describes how the results relate to the scientific literature and managerial practice. To conclude this research, Chapter 7 also discusses the limitations of this study and provides suggestions for further research.

2. LITERATURE REVIEW

This chapter reviews the relevant literature from previous studies. Multiple theoretical implications are used in regard to the research problem and research question. Based on these theories, the conceptual model and hypotheses tested in this study are formulated.

The literature review begins with an introduction to the service-dominant logic and its impact on the creation of service constellations. The S-D logic shapes the theoretical framework of this research. Thereafter, the relationship between customer engagement behavior and co-creation of value, and the implications of these concepts for this research, are discussed. Consequently, the concepts perceived service constellation, brand love and customer engagement behavior, and their underlying relations, are reviewed. Finally, the conceptual model and according hypotheses are developed.

2.1 Service-dominant logic, service innovation and service constellations

Perhaps the central implication of the S-D logic is the general change in perspective. In the current marketing and innovation perspective, the tangibility of manufactured goods and the separation of production and consumption qualities, are referred to as neither valid nor desirable (Zeithaml et al., 1985). Vargo and Lusch (2004, p.4): *“standardized goods, produced without customer involvement and requiring physical distribution and inventory, not only add to marketing costs, but also are often extremely perishable and nonresponsive to changing customer needs”*.

According to Vargo and Lusch (2004), a service-centered view of exchange implies that the supplier’s goal is to be simultaneously competitive and collaborative. Firms must learn to manage their network relationships and need to recognize that the customer is always a co-producer. They have to strive to maximum customer involvement in the customization of their offerings, in order to better fit customers’ needs. This perspective stresses the opportunities for achieving competitive advantage by assisting and using the customer in the process of value creation (Vargo & Lusch, 2004). Therefore, the S-D logic is used in this dissertation as the fundamental theoretical framework, as this thesis states that service constellations are not created by one actor, but come to existence as a result of continuous interaction between customers and suppliers.

The development and use of service constellations fit well within the S-D logic perspective. Service constellations are defined and explained as the combination of multiple,

interdependent services⁴ that provide complementary value to customers. Constellations are created and structured around the interrelations between different services. Due to the alignments between these different services, it empowers customers to integrate these services into a valuable composition of services (a constellation). From a customer perspective, services are perceived as *part* of a constellation, as the constellation makes a service complementary and valuable with other services within the constellation. The process of value creation is therefore a crucial driver to development of service constellations (Van Riel et al., 2013).

Service constellations are assessed within the S-D logic through the multi-level service design (MSD) identified by Patrício et al. (2011). The authors state that MSD contributes a service design method that assists the co-creative nature of customer experiences. According to the authors, MSD classifies service constellations as a tool for new service development and interaction between firms and customers. According to Van Riel et al. (2013), innovation embedded in service constellations is therefore likely to differ from innovation in the traditional (company-centered) view, where individual services are created in relative isolation. Innovation from a constellation perspective requires cooperation between many different actors, because few service providers possess the resources and capabilities to offer completely integrated services on their own. Therefore, constellations are usually the result of the alignment of services from multiple, different service providers (Van Riel et al., 2013).

From a constellation perspective, innovation has two important characteristics (Van Riel et al., 2013, p. 16): *“First, service innovation will often be architectural in nature. Innovation may result from a different arrangement of individual service elements (e.g., combining or aligning them differently), without necessarily introducing innovation into the individual service elements themselves”*. Meaning, architectural innovation builds upon already existing services. It is often the result from new customer experiences that identify (new) underlying technological interrelations between services. Secondly: *“Service innovation in the context of service constellations often occurs through a process of co-evolution “...”. Innovation is not necessarily a deliberate and explicitly coordinated process, but also partly a self-emerging one “...”. The co-evolution and assimilation of these three dimensions of innovation in service constellations, individual services, architecture and underlying service systems, make service constellations so competitive and successful”* (Van Riel et al., 2013, p. 17).

⁴ From this moment, the term ‘service’ is used to refer to both tangible and intangible products.

The co-evolution of innovation dimensions in service constellations is an extremely complicated process, which makes it critical for managers to understand the nature of constellations, its (interdependent) services and the actors involved in these constellations. Hence, for service innovation and constellations to work, it demands far-reaching cooperation of the actors who are part of the service system. Concluding, the concept of service constellations embraces fundamental implications of the S-D logic. Service constellations propose unique value propositions as a result from collaborative value creation between both suppliers and suppliers and customers (Van Riel et al., 2013; Vargo & Lusch, 2004; Patrício et al., 2011).

2.2 Customer engagement behavior and co-creation of value

Identifying the relationship between service constellations, customer engagement behavior (CEB) and co-creation of value, requires a careful definition and clear understanding of the concept CEB. The definition of CEB in the customer-to-firm relationship used in this dissertation focuses on the behavioral aspects of the relationship. As mentioned, customer engagement is an important desirable outcome of all innovation strategies and innovation management. It is an integral and essential part of process brought into life as a result from care and commitment to a business (Van Doorn et al., 2010). Customer engagement enables a firm to work with and learn from their customers, as engaged customers are willing to reflect and provide feedback on the business' products and service systems. Obtaining customer feedback, and connecting those insights to improve and innovate their services, enables firms to better design and manage their innovation processes and co-create value with their customers (Van Doorn et al., 2010). Therefore, CEB is conceptualized as the pivotal antecedent for co-creation of value in this study.

CEB, according to the S-D logic, encompasses far-reaching cooperation with customers and goes beyond transactions and purchase (Van Doorn et al., 2010). Engagement behavior can occur through many constituents and audiences. The digital world of the 21st century empowers high levels of customer connectivity. Customers can engage through multiple different channels: in person (e.g., in a retail setting), via the Internet (e.g., through posting photos and videos on social media or writing reviews about products) or via phone and mail (Van Doorn et al., 2010). Additionally, engagement behavior can be both *positive* (e.g., posting a positive brand message on a blog) and *negative* (e.g., organizing public actions against a firm). Engagement behavior can occur through shared inventiveness, co-design, or shared production of services. Van Doorn et al. (2010, p. 254): "*Participation in brand*

communities, blogging, and voluntarily suggesting improvements are all forms of customer engagement. Clearly, behavior such as making suggestions to improve the consumption experience, helping and coaching service providers and helping other customers to consume better, are all aspects of positive customer engagement behavior and co-creation”.

Ultimately, engagement behavior is designed to express customers’ experiences with a firm and can therefore also be used as an ‘exit-strategy’. Meaning, behavior designed to abridge or end the relationship with the brand (e.g., decrease consumption, non-renewal of a contract). In this conceptualization, customer loyalty, the attitudinal relationship with the brand, drives customers’ choice of engagement behavior (Van Doorn et al., 2010). Either way, a company needs both positive and negative forms of engagement to comprehend its customers better and learn and grow as an organization.

Moreover, Van Doorn et al. (2010) state that engagement behavior emerges from brand-related incentives (further explained in Section 2.5) and refers to the combination of behavioral responses within an emotional context. This emotional context is based on customers’ confidence and trust with a firm (Van Doorn et al., 2010). Likewise, engagement behavior can either be *active* or *passive*. The distinction between ‘active’ and ‘passive’ CEB has been studied in detail by Cioffi and Garner (1996). According to these authors, active customers search for information and reflect on it, in order to be able to make decisions. In contrast, a passive customer does not search for information. Passive customers do not reflect on new information, they are ‘absorbers’. An active customer would read an article regarding the firm and investigate the topic a little further, start a discussion about it. As a result, the likelihood of an active customer switching to a competitor is significantly smaller than that of a passive customer switching. Active customers express customer loyalty (Roos & Gustafsson, 2011).

As mentioned, customer loyalty is one of the most critical drivers for engagement behavior, indicating satisfied customers who are motivated to help the company grow. Therefore, *active* customers are the ones that are most likely to become engaged with a firm. The ones ventures must invest time and energy in, in pursuance of creating mutual beneficial (valuable) customer-supplier relationships (Roos & Gustafsson, 2011). In addition, the difference between active and passive engagement is conceptualized based on the customers’ willingness to *voluntarily* interact with a firm. Although relationships between customers and suppliers indicate a two-way approach, it is often the supplier who takes the initiative to connect with customers. However, this form of engagement is not preferred for mutual relationship building (Van Doorn et al., 2010). Of course, a firm must take the initiative to

create an interactive dialogue with their customers to some extent, but for long-term relationship building it needs to be the customer who establishes the relationship with the firm. Based on personal motivation and without any obligation to the firm, the customer connects with the firm (Vivek et al., 2012; Roos & Gustafsson, 2011). The company does not 'force' their customers to engage, by for example asking customers to evaluate their last purchase via an online questionnaire. This kind of 'engagement' behavior may result in customers who quickly fill in the survey (without really thinking about their answers) in order to be done with it, or people giving socially obligated (biased) responses.

In order to valuably co-create with their customers, firms need *active* engagement. Customers who are not stirred or biased in their thinking and are willing to come up with solutions on their own. Customer engagement requires active customer participation in the adjustments of existing and creation of new services. As a result, the conceptualization of CEB used in this study focuses on active engagement behavior. CEB is defined as follows: *The customer's voluntary motivation and behavioral manifestations to commit to a firm, beyond purchase, to improve existing and co-create new services.* Customer engagement provides the instruments for co-creation of value as it creates an interactive dialogue between suppliers and customers, facilitating ventures to learn and grow from customer intelligence.

2.3 The implications of value creation within service constellations

Customer value is a critical aspect in marketing, innovation and customer behavior research as it indicates what the customer needs, wants and expects from a service provider. The changed logic from goods-dominant to service-dominant logic required a reevaluation of the concept customer value and its implications for engagement behavior (Vargo & Lusch, 2004). In the academic literature and the previous sections, it has been established that the process of value creation requires an integrative approach to increase customer satisfaction, loyalty and ultimately engagement (Chandler & Vargo, 2011; Kuzgun & Asugman, 2015).

According to Chandler and Vargo (2011), this approach is based on three main assumptions: 1) Multiple-actor interactions within service systems indicate complex relationships between the firm and the customer, the customer and the customer and many-to-many. 2) Co-creation of value within service systems implies that value creation is not a process within a dyadic environment (created by one actor and delivered to the other), but is the result of co-creation between interactions of all the actors involved. 3) Establishing long-term relational benefits denotes that value (creation) occurs throughout the length of the

relationship. Value creation does not occur at a single point in time, as postulated in the traditional exchange view.

Concluding, the value creation concept is based on managing long-term, multi-actor, complex relationships and occurs throughout the length of the relationship. According to the S-D logic, the *dyadic* relationship between the firm and the customer is most relevant in this study, which indicates that value creation is a result of a mutual beneficial, highly cooperative process between customers and suppliers (Chandler & Vargo, 2011). Value provided by the firm is, for example, based on service quality or price benefits. Value created by the customer is, for example, satisfaction, trust, commitment and engagement. As mentioned, customers' motivation towards engagement depends heavily on the value they expect to extract from a firm. A service provider must deliver a service appropriate to the customer's needs and wants, a service which lives up to the customer's expectation (Van Doorn et al., 2010; Vivek et al., 2012).

The concept 'value' or 'value in use' has been highlighted within the S-D logic by Vargo and Lusch (2004, p. 4): "*Value in use is the individual judgment of the service based on a (dis)confirmation of some comparison standard to evaluate the perceived service performance*". The authors state the value cannot be predefined by the service provider. The user of a service defines the value during consumption, hence the term *value in use*. Moreover, Vargo and Lusch (2004) conceptualize value as the cognitive assessment of all the *functional* benefits of a service (e.g., price, quality, time-consumption).

Customer value in use⁵ from a service constellation perspective implies that firms need to focus on the perceived customer value of the constellation, rather than on individual services. Value is derived from the fragmented nature of services, the interrelations between services and the integration abilities it provides customers. Moreover, new value propositions could be generated not only by conceptualizing and developing new services, but also by developing new service constellations without necessarily altering any individual services (as stated in Section 2.1). Overall, the process of value creation is crucial for the existence and development of service constellations, as the constellation makes a service complementary and valuable with other services within the constellation. According to Van Riel et al. (2013) and Patrício et al. (2011), service constellations offer unique value propositions, by enhancing not only *basic*, but also *extended* functional qualities (e.g., convenience/ease of use). Service

⁵ From now on denoted as 'customer value'.

constellations allow the customers to conveniently integrate complementary and supportive services with each other, saving the customer time, energy and effort.

However, adopting a service constellation perspective to customer value also implies that customer value encompasses (yet) *unrealized* value. The degree to which a customer believes a service satisfies his or her needs is partly based on the customer's perceived *potential* value. The customer's perception that acquiring a company's service (within a constellation of services) exceeds the value of those currently owned. The value a customer derives from a service, and its according constellation, does not have to be immediately realized at time of consumption, but can also be realized in the future. Perceived potential value is therefore hard to determine, whereas factors such as novelty, marketing efforts and brand associations all play an important role in shaping customer value (Van Riel et al., 2013; Van Doorn et al., 2010).

Van Riel et al. (2013, p. 9-10) propose two implications necessary to capture the role of value creation within service constellations compared to value creation within services operating in isolation: *“First, from the perspective of the customer, the perceived value generated by elements of the service constellation is potentially greater than the simple sum of its elements. Second, the evaluation of services in the constellation may affect and depend on each other”*. Furthermore, Van Riel et al. (2013, p. 4-9) provide a fine example of such a process: *“A tourist would derive more value from a city trip when effective transportation or lodging services allow her to spend more time in museums, when a review service facilitates the prioritization of the attractions in those museums. Due to the fragmented nature of the travel industry, many service providers are likely to be involved in the production of mutually interdependent services that together comprise the trip “...”. The customer is likely to evaluate a range of services as an integrated experience, and that integration of services offers synergetic benefits that comprise a travel experience”*.

Concluding, the evaluations of the services used by the tourist on her city trip (e.g., the flight, the hotel or the museum) are intertwined. On the one hand, outstanding service experiences offered by the hotel (e.g., free room service) may positively influence the city trip. On the other hand, negative experiences while visiting the museum (e.g., long waiting times or a stolen wallet) may overshadow the correctly (positive) performed services. Moreover, due to the interrelations between these different services, the perceived potential value of the city trip is much higher for the tourist. The fragmented nature of the services allows the tourist to integrate the different services (to spend more time in the museum) than when the services operate in isolation.

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Another example to clarify this process: A company who designed their value proposition and innovation processes around a constellation of services is Apple. Apple is one of the few companies in the world who *purposely* managed to deliver a constellation of services. Apple aims to make life simple for their customers by providing products that customers can align into a valuable constellation. For example, when owning an iPhone and a MacBook, you can answer an incoming call on your phone with your computer. However, for the constellation to work, both devices need to work properly otherwise it disturbs the customer's service experience. When, due some sort of technological failure, the MacBook does not connect to the iPhone and an incoming call does not appear on the computer screen, the synergetic benefits proposed by the constellation disappear. Suddenly the iPhone and MacBook become two isolated, less valuable products. It is the *combination* of these services and their interrelations that generate more value to the customer than the individual, isolated services alone. Hence, it enables you to answer the call while working on your computer and not having to search for your phone. In that way, customers can experience synergetic benefits due to the integration abilities within service constellations, resulting in more customer value.

As mentioned in the previous chapter, the existence and development of economic exchange in the past century is entirely based on the concept of value creation. Additionally, the process of value creation is what created service constellations in the first place. The increased bargaining position of customers to 'want more for less' started in the middle of the 20th century and as a result, customers started (perhaps partially unplanned and unintentionally) integrating services in such a way that they experienced more value. The tourist planning a city trip to get the most out of the money and time available is not something new, but has been around for ages. However, the use and development of the Internet and according technology of the past twenty years has facilitated companies to start *assisting* customers in the process of value creation. Nowadays, suppliers are more able to develop and offer supportive and complementary services. For example, most electronic devices of this decade came to existence as a result of the integration of multiple different services and service providers. The Smartphone, the Smart TV or newest game consoles are perfect examples of services operating within a constellation of services. The value creation potential of these devices all depend on other, supportive services and the combination of these services assist the customer in the value creation process. Assisting customers in the value creation process is something in which Apple has been incredibly successful and is the primary reason why they have an extremely loyal and satisfied customer base.

2.4 Service constellations and customer engagement behavior

In pursuance of establishing a comprising theoretical framework and sufficiently capturing the influence of perceived service constellation on engagement behavior, a further developed understanding of customer behavior in the context of a constellation of services is needed. Therefore, the following paragraph discusses the relationship between customers and suppliers within these service systems, their involvement in the creation and development of service constellations and resulting customer behavior.

As mentioned in the beginning of this chapter, adopting a customer perspective in creating service constellations denotes far-reaching consequences for the service innovation process. Van Riel et al. (2013) declare that the concept of service constellations requires many more actors in the service system to take into account, which makes innovation decision-making more complex compared to an isolated service. However, including customers in the eco-systems involved in creating, combining and delivering these services and the relationships between them, makes organizations also more customer- and market-oriented. Concluding, from a service constellation perspective, optimal value propositions require intensive and long-term cooperation with customers.

Nevertheless, it is commonly mistaken that *suppliers* create the combination of complementary services. In reality, it is exactly the other way around. The *customers* are the ones who create and shape the service constellation. Customers identify underlying technological interrelations between individual services and integrate them into a complementary constellation. Although these constellations come to existence due to the involvement of multiple, different service providers, no provider purposefully orchestrated or coordinated the constellation that way (Van Riel et al., 2013). There are very few organizations who provided services with the intention that these services would be connected into a supportive constellation. Meaning, firms often create and deliver new services, initially not knowing customers will align these services with other services.

For example, remember the tourist and her city trip. The transportation service initially *only* helps the tourist to get (transport) to the city or the museum. The review service initially *only* helps the tourist in her decision-making process of which attractions to visit. The hotel initially *only* helps the tourist to find lodging. These service providers do not take into account that because of the combination of their systems, the tourist can spend more time in museums. Because the tourist knows beforehand what attractions are worth visiting (due to the information provided by the review service), she can adjust her transportation plans

accordingly so that she can spend more time in the museum. The *tourist* integrates the different services and the *combination* of these services provide synergetic benefits. Summarizing, service constellations often come to existence as a result of the (partially unplanned and uncoordinated) interactions among multiple actors and mainly due to the integration abilities of customers (Van Riel et al., 2013).

The extent to which a customer perceives a service as part of a larger constellation can have a severe influence on customer engagement behavior for two reasons. The first reason is explained in the previous section. The value proposition embedded in service constellations is what makes service constellations so competitive and successful. The fragmented nature of service constellations allows customers to integrate different services with each other, resulting in enhanced customer value. When customers get more from a firm, they are willing to give more in return; it is the art of mutual benefit. Customers are more likely to help a firm design and develop its services better, when they expect that their help results in (even) more customer value. The value a customer derives from a service affects the general evaluation of both the service and business and affects the customer's satisfaction, loyalty and engagement (Van Doorn et al., 2010; Vargo & Lusch, 2004).

Furthermore, the fragmented nature of service constellation services also enables customers to get involved and connected with service providers as they become co-producers. Customer involvement enhances the firm's relevance in customers' minds and is therefore associated with the intensity of customers' focus of engagement. Customer involvement is a cognitive, affective or motivational construct indicating a positive state of mind and commitment to a business (Vivek et al., 2012). The fragmented nature of services within constellations enhance more opportunities for customer-firm interaction, because both actors in the constellation need each other. Companies (usually) offer independent services to customers, but customers transform these services into valuable, *interdependent* constellations. In that way, in line with the S-D logic, the economical exchange of services within a constellation is based on a two-way relationship. The mutual dependency rooted in these service systems creates interaction between customers and suppliers. It stimulates customers to engage with the venture, in order to optimally design, structure and implement services as part of a larger constellation. Based on the findings above, the first proposition of this study can be formulated:

H1: The degree to which a customer perceives a service as part of a larger constellation has a positive effect on the customer's engagement behavior.

2.5 Brand love and customer engagement behavior within service constellations

As mentioned in the previous chapter, the growing literature on customer behavior management stresses the pivotal role of managing customer-brand relationships to stimulate engagement behavior. The initial focus of branding research regarded customers' associations and their beliefs about the attributes (the products) of the brand (Keller, 1993). Berry (2000) found in his research about branding that the brand's 'meaning' that customers derived from the service experience was more important than its actual product. Clarifying, the company's reputation can have a major influence on the buyers' consumption experience. Hence, Berry (2000) suggests that 'the company' becomes the primary brand rather than the product. Therefore, the company's reputation and perceived brand image is likely to influence customer behavior.

Since its introduction in the 1950's, the notion of brand image has become commonplace in customer behavior research. Carrol and Ahuvia (2006, p. 79) give the following definition of brand image: "*The impression in peoples' minds of a brand's total personality. The real and imaginary qualities and shortcomings of a brand, which is developed over time*". Customer research shows that the reputation and overall brand image of a company may be used as a heuristic for judging the quality of the product. Customers associate and evaluate the quality of the offering based on their image of the company. Customers use brand image or a company's reputation as a tool to judge product quality and to refine their choices and vice versa (Dawar & Parker, 1994; Hoyer & Brown, 1990; Jacoby et al., 1976). Brand image is something conscious in customers' minds which is relatively easy to express. Customers like a brand or not. Based on the overall reputation and (functional) attributes of the company offerings (e.g., product quality, price, eco-friendliness), customers shape their brand image of a company (Bolton & Drew, 1991; Richardson et al., 1994; Teas & Agarwal, 2000).

However, research from Liljander and Strandvik (1997) argued that the conceptualization and measurements of customer behavior solely based on general customer brand perception fall short. Therefore, the authors stressed the importance of assessing more emotional, subconscious aspects of the brand relationship. As a result, another concept in branding research has gained academic attention in the marketing and innovation field: brand love. Derived from the notion of interpersonal love in psychology, brand love has gained academic attention since the beginning of this decade. According to Batra et al. (2012), brand love is something unconscious, deeply rooted in the customer's mind and represents the

customer's emotional attachment to a particular brand. Albert and Merunka (2013) articulate brand love as a multidimensional construct and closely related to the constructs brand image, brand trust, brand commitment and brand identification. For example, brand image has a substantial influence on customer brand love as the two concepts and their measurements are highly interdependent and intertwined. High levels of brand image would indicate higher levels of brand love and vice versa. Yet, the authors, and this paper, argue that they are also different.

Brand love arises, and is strengthened by, customers buying and/or using a brand's products. It is a result of continuous positive service experiences and brand encounters. However, a good brand image in customers' minds does not have to be the result from service experiences at all. Positive brand image can easily be established through (other) incentives, such as the customer's environment (e.g., commercials in de media or reviews from friends), without the customer buying or using the brand's services. Additionally, loved brands enrich the customer's consumption/service experience by connecting their 'brands' to their services. The process of imparting a brand with delivering valuable services grants an extra dimension to the customer's service experience and is distinguishing for relationship building (Batra et al., 2012; Hatch & Schultz, 2008).

Hatch and Schultz (2008, p. 27) explain how the interdependency between a venture's product and its brand form a 'constellation' on its own; a constellation of symbols: *"When you visit a Nissan dealer's showroom you are wrapped in an experience that expresses the merger of technology, bold design and thoughtfulness. You feel as if you have been transported inside the brand. Nissan's newer products reflect this same design sense and interconnect with the badge and the showroom to form a constellation of symbols "...". When you drive your new Xterra home from the shiny Nissan dealership, you weave the brand's symbols into your life and give them your own meanings"*. Summarizing, customer brand love is likely to result from continuous positive service experiences and the interconnections between the brand's symbols; the value proposition and its brand (the stores, the logo and its meaning). All these aspects support and complement each other and comprise into a constellation on its own. A constellation where the combination of the brand's product and its meaning enrich the customer's consumption experience and gets customers emotionally attached to a brand.

Moreover, Albert and Merunka (2013) state that brand love is an outcome based on brand image, trust, commitment and identification. Brand love is a feeling a customer develops towards a brand, whereas brand trust merely indicates the customer's expectations

about the brand's honesty and reliability. Furthermore, the authors denote brand commitment as a customer's willingness to maintain a relationship with a brand. Nevertheless, brand commitment can also arise due to lack of alternatives. Meaning, brand commitment can result from a comparison of existing alternatives in the market and 'forces' a customer to commit to a brand. This does not occur with brand love. Brand identification and brand love are also different. Love exists and applies to a small number of brands, while customers identify with a lot of brands. Consequently, a customer who trusts, commits and identifies with a brand develops positive feelings towards it, which ultimately stimulates brand love.

Likewise, Fournier (1998) showed that the concept of love was far more vital for building brand relationships than general brand perception. The main reason for this is that there is a personal aspect involved in customers' brand love, which is not the case for brand image. Customers tend to relate themselves to brands (identification), because they use brands as the personification of one's self-image; loved brands express deeply held customer needs and beliefs. Once a customer identifies with a brand or the brand contributes to the person's self-image, customers are more willing to commit to the brand. Customers are more willing to invest time and energy in building brand relationships, which results in emotionally attached customers (Khare, 2004; Aaker, 1996).

Creating emotional connections with customers and relationship building is something Apple stands light years ahead on compared to its competitors. Selling extremely well-designed products, while simultaneously making things simple for your audience, is a crucial part of getting people on side and connected with your brand. Apple represents a creative and innovative vision, while believing in the simple, not the complex. A vision a lot of people can identify themselves with. Apple's products embody and represent this vision. Apple products are associated and referred to as being highly supportive all over the world. However, it is not just its products and the according constellation that gets the people connected to the brand. It is the combination of the products, the retail stores, its logo and vision that *together* support and constitute the ultimate service experience, which is why so many people *love* Apple. Such a process of personalization requires tremendous investments of time and effort and frequent customer-firm interactions, but is needed for establishing long-term brand engagement (Islam & Rahman, 2016).

Overall, it becomes clear that customer engagement is likely to be positively influenced by the customer's brand love. Furthermore, the customer's service experience and brand engagement is likely to depend on the combination of the firm's product, the brand and its meaning. Therefore, it will be interesting to examine to what degree brand love has an

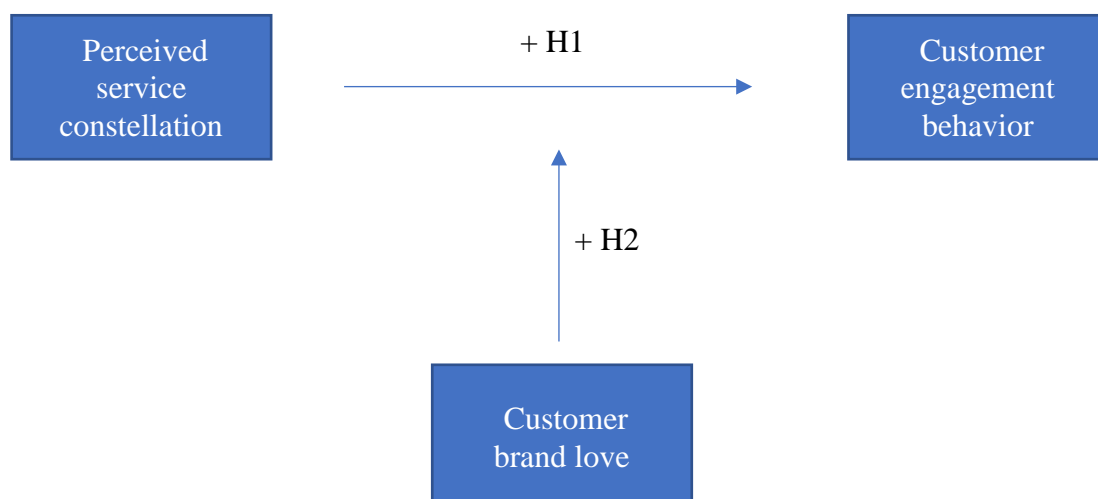
influence on the relationship between the customer's constellation experience and resulting engagement behavior. This study proposes that the degree to which a customer perceives a service as part of a larger constellation and the resulting behavioral manifestations to engage, is positively influenced by the emotional connection a customer has with the brand. As a result, the second proposition of this study can be formulated:

H2: The positive effect that perceived degree of service constellation has on customer engagement behavior is positively influenced by the customer's brand love.

2.6 Conceptual model

Concluding this literature review and the propositions stated, this study proposes that the degree to which customers perceive a service as part of a larger constellation has a positive *direct* effect on customers' engagement behavior (H1), due to enhanced customer value and mutual dependency between customers and suppliers in the service systems of service constellations. However, this relationship primarily explores customer experiences in service constellations from a value creation perspective (functional dimension). In order to provide more detailed insights in the customer's mindset regarding service constellations, this study specified a second proposition examining customer experiences in service constellations from an emotional dimension. This study assumes that the emotional connection a customer has with a brand positively affects the relationship between PSC and engagement behavior. The relationship between perceived degree of service constellation and customer engagement is therefore expected to be positively moderated by customer brand love (H2). The resulting conceptual framework is as follows:

Figure 1: Conceptual model



3. RESEARCH METHODOLOGY

This chapter addresses the research methodology (research strategy and according design) of this study. The sampling procedure and the measurements of the variables are discussed and operationalized. Furthermore, the data analysis method used to statistically test the propositions of this study is introduced and so are the precautions used to ensure the validity and reliability of this research. The last part of this chapter describes the manipulation checks needed to determine whether or not it is allowed to run the proposed research design.

3.1 Research design

A field experiment is used as research design. This dissertation tries to conduct regularities on the relationship between perceived service constellation, brand love and customer engagement behavior. Furthermore, the objective of this research is to provide new insights on the customer's mindset regarding service constellations to the importance of engagement behavior. Accordingly, an experimental approach is most appropriate to use as it allows to manipulate the concepts of PSC and brand love and investigate their influence on customer engagement. This study states that customer engagement behavior is based on a firm's ability to deliver supportive and complementary services and create emotional connections with customers. As a result, the experimental design is a 2; perceived service constellation, x 2; brand love full factorial design.

The experiment involves two supermarkets: Albert Heijn and the Aldi. According to research from the Dutch Consumentenbond (2014), Dutch consumers voted Albert Heijn as their most loved supermarket in the Netherlands. A quarter of the 900 respondents voted Albert Heijn as their favorite supermarket. The Aldi was voted the least favorite supermarket. Overall, Albert Heijn is perceived as a highly innovative and popular brand. It has a luxury reputation and its products are adopted by a large amount of people. Due to their collaborative network (for example, cooperation with PostNL and Sushi Daily), Albert Heijn enables high constellation opportunities which offer synergetic benefits to customers. In that way, Albert Heijn tries to create emotional connections with customers to stimulate their customers' brand love. On the other hand, the Aldi is assumed to be a modest, less popular and cheaper brand with relatively low constellation opportunities and customer brand love. It is expected that, by comparing the two brands and their services with each other, it generates a deeper and more profound understanding of the customer's mindset towards service constellations and brand love than when only one brand is used.

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The experiment describes a brand extension of the two supermarkets. Both supermarkets have extended their offerings by developing and providing their own Smartphone. The experiment is divided into four scenarios (2 x 2 high vs. low differential design). Two scenarios based on the Smartphone and according constellations from each brand. The four scenarios denote respectively high and low levels of perceived service constellation and brand love. Albert Heijn is perceived to be the brand that initiates *high* customer brand love and the Aldi represents *low* customer brand love. The first scenario about Albert Heijn sketches *high* constellation opportunities and is assumed to result in *high* levels of customer value. The second scenario about Albert Heijn sketches *low* constellation opportunities and is assumed to result in *low* customer value. The same goes for the two scenarios regarding the Aldi.

Concluding, the experiment describes a scenario presenting a Smartphone within a constellation of services and a scenario presenting a Smartphone in isolation (no constellation opportunities) for both a luxury and modest brand. In that way, customers' engagement behavior is measured based upon their perceived service constellation and brand connection. The four different groups are presented in Table 1 below.

Table 1: Experimental design (groups)

EXPERIMENTAL DESIGN (GROUPS)	HIGH BRAND LOVE	LOW BRAND LOVE
HIGH PSC	AH_High	Aldi_High
LOW PSC	AH_Low	Aldi_Low

Data will be collected via an online questionnaire. Participants are asked to rate their mindset towards the Smartphone and the according brand. Moreover, the respondents are asked if they would be willing to engage with the firm to help improve current or develop new products. It is expected that a participant who is given high (low) constellations opportunities experiences high (low) customer value. Therefore, different levels of perceived service constellation should also indicate different levels of engagement behavior. High perceived degree of service constellation should mean more engaged customers and vice versa. The experiment also investigates whether or not the perceived brand love differs for the two brands and if this difference has a substantial impact on the relationship between the PSC and customer engagement. A manipulation check is used to establish that the AH_High and Aldi_High group significantly differ in terms of PSC compared to the AH_Low and

Aldi_Low group. Furthermore, a manipulation check is used to determine whether or not Albert Heijn is indeed perceived as a more 'loved' brand than the Aldi.

3.2 Sampling

In this research, people between 15 and 65 years old are targeted as respondents. This age category is relatively large and allows many people to participate in the experiment. People between 15 and 65 use Smartphones in their daily lives and are therefore expected to be familiar with the benefits and drawbacks of constellations embedded in Smartphones (e.g., contactless payment with a Smartphone). Children (below the age of 15) and elderly (above the age of 65) are assumed to be less familiar with the smartphone industry, its fast-paced development of technology and the service constellations within them. These groups are therefore excluded from the experiment.

Given the 2 x 2 differential design, it is statistically acceptable to use a (minimum) target sample size of 100 respondents. At least 25 respondents are needed for every group (Babbie, 2010). This sample size should be sufficient to make generalizable and representative predictions about the entire population (Vennix, 2011).

3.2.1 Sampling strategy

The research is conducted in the Netherlands; the language of the questionnaire is also in Dutch. Within the sample there will be a continued focus on maintaining an equal distribution of males and females and maintaining equal sample sizes between the different scenarios (groups). As mentioned, the experiment uses four different scenarios. If participants are exposed to all four scenarios, this might result in biased responses. To prevent this from happening and preserve the quality of this study, each participant will be *randomly* assigned to only *one* of the scenarios. The respondents will be enlisted by the researcher himself, either face-to-face or online through social media. The recruitment takes place between the 20th and 30th of June 2017.

3.3 Operationalization and measurement instruments

The following section provides the measurements of the chosen variables of the conceptual model. The concepts perceived service constellation, brand love and customer engagement behavior are operationalized based on the definitions given in the previous

chapter and related research. Table 2 presents the items for the questionnaire. See Appendix 1 and 2 for the experimental design and complete questionnaire.

3.3.1 Perceived service constellation

The independent variable perceived service constellation is operationalized based on the definition from Van Riel et al. (2013) and Vargo and Lusch (2004) given in the previous chapter. PSC addresses value creation based upon the interdependent nature of services and the ability it provides customers to integrate these services into a unique constellation. PSC is measured through six items with a five-point (1 strongly disagree – 5 strongly agree) Likert-scale. PSC: *‘The customer’s perception that he or she has the opportunity and ability to integrate a combination of multiple, interdependent services as part of a larger constellation, which results in supportive, facilitating and complementary benefits’.*

3.3.2 Customer brand love

The independent (moderator) variable brand love is, as stated in the previous chapter, considered a multidimensional construct. As a result, the concept brand love is divided into four dimensions measuring all different aspects of love: self-brand integration, passion-driven behavior, emotional connection and long-term relationship, as defined by Batra et al. (2012) and Carrol and Ahuvia (2006). Customer brand love is operationalized based on the brand's ability to express the customer's identity and is measured through sixteen items with a five-point (1 strongly disagree – 5 strongly agree) Likert-scale. Brand love: *‘The customer’s emotional attachment to a brand, based on the brand’s ability to represent the customer’s identity and deeply-rooted needs, wants and beliefs’.*

3.3.3 Customer engagement behavior

The dependent variable customer engagement behavior is operationalized by focusing on *active* engagement behavior, as explained in Section 2.2. CEB is measured through four items with a five-point (1 strongly disagree – 5 strongly agree) Likert-scale. CEB: *‘The customer’s voluntary motivation and behavioral manifestations to commit to a firm, beyond purchase, by providing feedback on the firm’s services and organizational processes, in order to help improve existing and co-create new services.’*

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Table 2: Latent constructs, dimensions and constituent items

LATENT CONSTRUCTS, DIMENSIONS AND CONSTITUENT ITEMS

CONSTRUCT	Dimension	Item (5 point Likert-type scale)
PERCEIVED SERVICE CONSTELLATION	Customer value	The smartphone of this brand operates with other (external) services (e.g., travelling or banking).
		The smartphone of this brand enables far-reaching cooperation between different (other) service providers.
		The smartphone of this brand would enable me to easily integrate different (external) services (e.g., travelling or banking) with each other.
		The smartphone of this brand would connect and combines multiple aspects of my life (e.g., traveling or banking).
		The smartphone of this brand would save me a lot of time, energy and effort.
		The smartphone of this brand would be very valuable to me.
BRAND LOVE	Self-brand integration	*Brand name* symbolizes (represents) the kind of person I really am inside.
		Brand name is an extension of my personality (my character, norms and values).
		Brand name makes me feel connected to others.
		Brand name really makes me feel part of a larger (social) community.
	Passion-driven behavior	I would very much like to learn more about *Brand name*
		I would often pay attention to news regarding *Brand name* (e.g., watching commercials or

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		<p>flyers regarding discounts on the *Brand name* smartphone).</p> <p>I would be willing to invest a lot of time and money in products from *Brand name*.</p> <p>I would desire (more) products from *Brand name*.</p>
	Emotional connection	<p>*Brand name* is very pleasurable (valuable) to me.</p> <p>*Brand name* makes my life a lot more enjoyable</p> <p>I would feel highly (psychologically) comfortable buying/using products from *Brand name*.</p> <p>I have a strong sense of natural fit with *Brand name*.</p>
	Long-term relationship	<p>When I would hear something bad about *Brand name*, I would question it in my own mind.</p> <p>The degree to which people around me buy or use products from *Brand name*, would not influence me in buying or using products from *Brand name* at all*.</p> <p>I would absolutely be buying/using products from *Brand name* for a long time.</p> <p>*Brand name* would definitely be part of my life in the future.</p>
CUSTOMER ENGAGEMENT BEHAVIOR		<p>I would absolutely be willing to commit to *Brand name* by reflecting on current products/services from *Brand name* on my own.</p> <p>I would be highly motivated to let *Brand name* know what is wrong or can be improved with its current products or services, because this can help *Brand name* innovate their offerings.</p>

	<p>I would like to support and help *Brand name* by presenting my own ideas for new products/services very much.</p>
	<p>I would definitely reach out to *Brand name* to work together to create new valuable products/services.</p>

3.4 Validity and reliability

The measurements of this research need to meet the criteria of being both reliable and valid in order to establish a profound research. The methods used in this research to verify these two requirements are now discussed in detail.

First of all, a research and the according research instruments need to be valid (Field 2013). Research validity can be explained as the extent to which an empirical measure adequately measures the real meaning of the constructs intended to be measured in the research (Field, 2013). In this research, different items are identified for all the variables of interest, with the use of reviewed data. Churchill (1979) developed a three-step analysis to develop better measurements to improve the construct validity in a research. The first two steps have been done in the previous paragraphs, namely creating dimensions and generating items to measure the variables. The third step as suggested by Churchill (1979) is to purify the measure. This means that all the items are tested if they measure only one thing and the thing that is ought to be measured. Factor analysis and Cronbach's Alpha are examples to purify the items.

Factor analysis measures if all items load on one factor (construct), which indicates whether these items all measure the same concept. Cronbach's Alpha tells whether or not items measure a single, one-dimensional latent aspect of individuals. Cronbach's Alpha does this by using 'split-half reliability'. This method splits the scale set into two randomly selected sets of items. A score for each participant is calculated on each half of the scale. The scale is considered reliable when a person's score on one half of the scale is the same (or similar) to their score on the other half. The values of Cronbach's Alpha ranges between scores of 0 and 1. A score of .70 or above implies that the questions are relevant for the purpose of the measurement and can be used in the research (Field, 2013, p. 708). Both a Cronbach's Alpha test on the items and a factor analysis will be conducted to test whether or

not questions of the questionnaire fit the concepts in conceptual model. Furthermore, a double-back translation procedure is used to improve the quality of the measurements by translating the items of the questionnaire from English to Dutch and back.

Secondly, a research and its research instruments need to be reliable (Field, 2013). The reliability of a research can be explained as the degree to which the same results appear each time the research is repeated. The online questionnaire and the methodology chapter of this research, which explains the research strategy, sampling procedures and measurement of variables, enable a researcher to replicate this research and reproduce the results.

3.5 Data-analysis

A two-way independent Analysis of Variance (ANOVA) using SPSS will be used to test the system of relationships between the latent variables of the conceptual model. ANOVA analyses the differences among group means (in this case, four different scenarios) and their associated procedures to indicate the variation among and between these groups. ANOVA tests if the mean scores on a dependent variable are equal across different levels of a categorical independent variable (Field, 2013).

The experiment in this study is built upon four different groups and examines different levels of engagement behavior based on the different groups. The four different groups in the experiment are used to indicate different levels of PSC and brand love. Summarizing, Hypothesis 1 measures the direct effect of PSC on customer engagement. Hypothesis 2 examines the moderating effect of customer brand love on the relationship between PSC and CEB. These hypotheses are tested using a two-way ANOVA with PSC and brand love as the two factors. PSC and brand love are measured upon two levels: 'high' or 'low', resulting in a 2 x 2 factorial design⁶.

3.6 Manipulation checks

Two one-way ANOVA procedures were used as manipulation checks. In order to check the condition whether or not it is allowed to run the proposed experiment and scenarios, it is necessary to establish that the scenarios are designed in such a way that the AH_High and Aldi_High group provide (significantly) more perceived degree of service constellation to the respondent (customer) than the AH_Low and Aldi_Low group. Furthermore, it is expected

⁶ The items of the questionnaire measuring the concepts PSC and brand love are not needed in the main analysis, but are needed for the manipulation checks.

that the Albert Heijn is perceived as a more ‘loved’ brand than the Aldi. Therefore, the Albert Heijn groups should score significantly higher on brand love than the Aldi groups. As a result, in these manipulation checks, the scenario to which the respondent is exposed (variable: Group) becomes the independent variable and respectively perceived service constellation (PSC) and brand love (BrandLove) the dependent variable.

First, the differences in perceived service constellation per group were investigated. Table 3 shows that the mean scores on PSC of the AH_High and Aldi_High group were both around 3.8. The mean scores on PSC of the AH_Low and Aldi_Low group were respectively 2.1 and 2.4. A post hoc test was used to determine whether or not these group means significantly differed from each other. Since the Levene’s test was significant at alpha .05 ($p < .05$), meaning that there was no homogeneity of variance, a Games-Howell post hoc procedure was most appropriate to use (Field, 2013). The Games-Howell procedure showed significant results for the mean differences of PSC of the AH_High group compared to the AH_Low and Aldi_Low group. Furthermore, the mean PSC score of the Aldi_High group was also significantly different to those of the AH_Low and Aldi_Low group ($p < .05$). These results demonstrate that the four scenarios adequately entail a product within a constellation of services and a product without a constellation of services. The post hoc results are presented in Table 4.

Table 3: Mean scores PSC per group

	MEAN	STD. DEVIATION
AH_HIGH	3.8155	.3406
AH_LOW	2.1302	.8283
ALDI_HIGH	3.8269	.5909
ALDI_LOW	2.3988	.8904

Table 4: Manipulation check PSC: Post hoc procedure

	SCENARIO	MEAN	STD. ERROR	SIG.	
GAMES-HOWELL					
	AH_HIGH	AH_Low	1.6853	.1306	.000
		Aldi_Low	1.4167	.1471	.000

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ALDI_HIGH	AH_Low	1.6967	.1525	.000
	Aldi_Low	1.4281	.1668	.000

Secondly, another one-way ANOVA was used to determine if customers’ perceived brand love towards Albert Heijn was significantly higher than customers’ brand love towards the Aldi. Therefore, the mean scores on brand love of the AH_High and AH_Low group were compared to those of the Aldi_High and Aldi_Low group. The means scores on brand love were approximately 2.8 for both the AH_High and AH_Low group and 2.1 for both the Aldi_High and Aldi_Low group. Again, a post hoc procedure was used to investigate if the mean scores on brand love of the Albert Heijn groups were significantly different to those of the Aldi groups. The post hoc procedure showed significant results for the mean differences of brand love of the AH_High group compared to the Aldi_High and Aldi_Low group and the AH_Low group compared to the Aldi_High and Aldi_Low group ($p < .05$). Therefore, the experiment supported the expectation that customers love the supermarket Albert Heijn significantly more than the Aldi. The results are presented in Table 5 and 6.

Concluding, both manipulation checks were shown to be successful. These manipulation checks verified the proposed experiment and according scenarios of this study. The experiment adequately described two scenarios (groups) providing high (low) levels of perceived service constellation and two scenarios (groups) representing high (low) levels of customer brand love. The complete results can be found in Appendix 3.

Table 5: Mean scores brand love per group

	MEAN	STD. DEVIATION
AH_HIGH	2.8631	.7021
AH_LOW	2.8203	.7256
ALDI_HIGH	2.1218	.6312
ALDI_LOW	2.1339	.7122

Table 6: Manipulation check brand love: Post hoc procedure

	SCENARIO	MEAN	STD. ERROR	SIG.
DIFFERENCE				
TUKEY HSD				
AH_HIGH	Aldi_High	.7413	.1548	.000
	Aldi_Low	.7292	.1519	.000

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AH_LOW	Aldi_High	.6985	.1500	.000
	Aldi_Low	.6864	.1471	.000

4. DATA-ANALYSIS

In the following two chapters the data is statistically analyzed. This chapter starts with a description of the background of the respondents. Furthermore, the data structure and resulting transformation are explained. Thereafter, the results of the factor and reliability analysis are described in detail. Finally, the last part of this chapter assesses the assumptions necessary to conduct a two-way ANOVA.

4.1 Data description

The empirical data collection resulted in 173 respondents who participated in the experiment. There were two cases with missing values, so these cases were deleted. Thereafter, potential outliers were examined. Hoaglin and Iglewicz (1987) demonstrate that detecting outliers with SPSS, by multiplying the interquartile ranges of the respondent scores per variable in the default setting (1.5 and 3), is often inaccurate. This means that SPSS denotes cases as an outlier, while the actually are not. Only cases denoted with a ‘star’ (outside the range of three times the difference between the upper-lower quartile) are considered critical outliers. Cases denoted with a ‘circle’ are not, unless the researcher assumes otherwise. The boxplots shown in Appendix 4 do not show any critical (star) outliers. Therefore, all the remaining 171 respondents are used in the data analysis ($n = 171$). Of those 171 respondents 68 (39.8%) were male and 103 (60.2%) female, which is semi- equally distributed. Most of the respondents (86%) were between 15 and 25 years old and more than half (66%) of the respondents were highly educated (college or university degree). These descriptive statistics are summarized in Tables 7, 8 and 9 below. The group sizes are respectively 42, 48, 39 and 42 for the AH_High, AH_Low, Aldi_High and Aldi_Low group (see Table 10 below). The difference between the largest and smallest group size is smaller than 1.5 ($48/39 = 1.23$), which means that there were equal group sizes (Field, 2013). These descriptive statistics can also be found in Appendix 5.

Table 7: Gender distribution of the sample

GENDER	FREQUENCY	PERCENT	CUMALITIVE PERCENT
MALE	68	39.8	39.8
FEMALE	103	60.2	100

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TOTAL	171	100
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Table 8: Age distribution of the sample

AGE	FREQUENCY	PERCENT	CUMULATIVE PERCENT
15 - 25 YEARS	147	86	86
26 – 35 YEARS	9	5.3	91.2
36 – 45 YEARS	1	.6	91.8
46 – 55 YEARS	10	5.8	97.7
56 – 65 YEARS	4	2.3	100
TOTAL	171	100	

Table 9: Education distribution of the sample

EDUCATION	FREQUENCY	PERCENT	CUMULATIVE PERCENT
VMBO/MBO 1	1	.6	.6
HAVO/VWO	57	33.3	33.9
MBO 2 – 4	1	.6	34.5
HBO	31	18.1	52.6
WO	81	48.0	100
TOTAL	171	100	

Table 10: Groups and according group sizes

GROUPS (SAMPLE SIZE)	HIGH BRAND LOVE	LOW BRAND LOVE
HIGH PSC	AH_High (N = 42)	Aldi_High (N = 39)
LOW PSC	AH_Low (N = 48)	Aldi_Low (N = 42)

4.2 Data structure and transformation

Before the data could be analyzed, the data set needed to be transformed in SPSS from a so-called ‘wide’ format to a ‘long’ format. Wide formats are mostly needed for a repeated measure ANOVA and MANOVA analysis. Long formats are more suitable for a N-way independent (in this case a two-way) ANOVA procedure (Field, 2013). In a wide format the data is structured in blocks (each scenario represents a block) in a horizontal way. The result is that most of the data is empty since every respondent is assigned to only one scenario. In a

wide format there are 120 variables (30 items of the questionnaire times 4 scenarios), but the respondent only has scores on 30 of those variables (1 scenario) and not on the other 90 variables (three scenarios). Therefore, the data was therefore transformed in such a way that these blocks are positioned vertically with only 30 variables and each variable contains a value per respondent.

4.3 Factor analysis and internal consistency

An exploratory factor analysis (principal axis factoring) was used on the entire data set (171 respondents) to test whether or not the questions of the questionnaire fitted the concepts in the conceptual model. The primary concern of the factor analysis in this research was data summarization; identifying underlying dimensions and constructs based on correlations between multiple items. According to Field (2013), an exploratory factor analysis is most appropriate for data summarization purposes. The identification of underlying dimensions and constructs in this research is based on their common variance, while taking the unique variance (random variance) per measurement into account. Therefore, a principal axis factoring⁷ was conducted on the first 26 items of the questionnaire. To improve factor loadings, factor rotation (orthogonal, Varimax) was used. The conceptual model assumes independent factors and orthogonal rotation does not allow correlation between factors (Field, 2013). Moreover, orthogonal rotation resulted in better factor loadings compared to oblique rotation⁸

The initial factor analysis was run to obtain eigenvalues for each factor in the data. Three factors had eigenvalues over Kaiser's criterion of 1 and in combination explained 68% of the total variance in the model. The Scree plot showed an inflection that justified retaining three factors. Therefore, three factors were maintained. All the remaining items loaded significantly (factor loadings of at least .5) on the respective factor and the items that clustered around the same factor suggested that factor one represented brand love, factor two perceived service constellation and factor three, customer engagement behavior.

The first step of the factor analysis was investigating the communalities and correlation matrix. A communality indicates the proportion of common variance presented in a variable and needs to be at least .40 for a sample size between 150-200. The correlation

⁷ Principal *component* factoring implies that all the variance per measurement is unique variance and does not include unique (random) variance. Principal *axis* factoring does control for measurement error.

⁸ Oblique rotation (direct oblimin) resulted in negative factor loadings, which was not the case for the orthogonal rotation (Varimax).

matrix shows whether or not items correlate with each other and are therefore expected to cluster together. Correlations in the correlation matrix need to be at least .30 (Field, 2013). Items 11,12, 19 and 20 had communalities below .40 and were therefore deleted. According to the correlation matrix, items 7 and 8 correlated extremely high (correlation of .790). Correlation between items of .8 or higher is considered too high, resulting in multicollinearity (Field, 2013). At this point, the resulting determinant of the correlation-matrix was lower than .00001 (determinant = .000003). A determinant of the R-matrix lower than .00001 indicates that there is multicollinearity between the items (Field, 2013). The removal of items 7 and 8 solved this issue, as the determinant of the R-matrix increased to .000035. Hence, items 7 and 8 were deleted. Thereafter, the data was rotated and the orthogonal rotation resulted in four crossloaders. The difference between the highest and second highest factor loading was smaller than .20 for the items 5, 6, 9 and 10. These items were also removed.

Furthermore, the differences between the observed correlations and correlations based on the model were checked by examining the percentage of non-redundant residuals. Rule of thumb is that this percentage should be less than 50%, and the lower this percentage, the better (Field, 2013). There were 13 (10%) non-redundant residuals with absolute values greater than .05, indicating good model fit of the data. After the completion of the factor analysis, an additional reliability analysis measuring internal consistency (using Cronbach's alpha > .70) for each subscale (factor) was conducted. The Cronbach's alpha was greater than .80 for each of the (three) subscales, which is well above the acceptable limit of .70 (Field, 2013). No deletion of items in the reliability analysis would have improved the Cronbach's alpha of the respective subscale. The Kaiser-Meyer-Olkin measure verified the sampling adequacy for the analysis, KMO = .86. Furthermore, the significant Bartlett's test of Sphericity verified the assumption that the correlation matrix was different from an identity matrix ($p < .05$). After the entire analysis, ten items (Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q19 and Q20) of the questionnaire were deleted.

4.4 Assumptions

A two-way ANOVA has multiple assumptions that need to be checked in order to conduct a proper ANOVA analysis and strengthen the results. In this part of the data analysis chapter, these assumptions are assessed in detail. The first three assumptions of the ANOVA relate to the study design. Thereafter, the normality distribution and the homogeneity of variance of the data set are analyzed. The assumptions of normality and homogeneity of

variance are not tested against the actual scores (observations) that have been collected, but against the *predicted values* and *standardized residuals* (errors).

4.4.1 Three main assumptions of ANOVA

The first assumption that needs to be checked is the measurement scale of the dependent variable. The dependent variable should be measured on a continuous scale (interval or ratio level). The dependent variable, customer engagement, is measured through a 5-point Likert scale, which can be treated as a continuous scale (Field, 2013). Secondly, the independent variables should consist of two or more categorical groups (Field, 2013). Both the independent variables perceived service constellation and brand love are measured with two levels (high or low). This means that the variables PSC and brand love consist of categorical groups. Thirdly, this research should have independence of observations, which discloses that there is no relationship between the observations in each group or between the groups themselves. This assumption is also met, because each respondent is randomly assigned to only one of the four groups.

4.4.5 Normal distribution

The fourth assumption of ANOVA that needs to be met is the normality assumption. The residuals of all the four groups should be normally distributed. The skewness and kurtosis and Shapiro-Wilk test for normality are used to check whether the residuals of customer engagement are normally distributed. The normality distribution of the data-set is tested for all the data collectively, as this is most appropriate when there are small sample sizes (< 50) in each group (Faraway, 2015; Kutner et al., 2005). The skewness and kurtosis divided by the standard error of the skewness and kurtosis were tested among the values -2 to 2. When these resulting values are beyond the range -2 to 2, it can be concluded that the residuals of customer engagement are not normally distributed. When these scores lie between these ranges, it can be concluded that the assumption of normality is met (Field, 2013).

The skewness and kurtosis divided by the standard error of the skewness and kurtosis of the residuals were within the ranges of -2 to 2, which means that the residuals of CEB were normally distributed. The Shapiro-Wilk test supported these findings. The Shapiro-Wilk test showed an insignificant result ($p > .05$), which confirms that the residuals of CEB were approximately normally distributed. Based on the skewness and kurtosis of the data and the Shapiro-Wilk test, it can be concluded that the assumption of normality is validated. The results of the normality tests are presented in Table 11 and Appendix 6.

Table 11: Normality test residuals customer engagement

CUSTOMER ENGAGEMENT	SHAPIRO-WILK		SKEWNESS/KURTOSIS				
	Statistic	Df	Sig.	Skewness	Std. Error	Kurtosis	Std. Error
RESIDUALS	.990	171	.270	.121	.186	-.305	.369

4.4.6 Homogeneity of variance

The sixth and last assumption of ANOVA is that there is homogeneity of variance. The homogeneity of variance states that all comparison groups have the same variance. This assumption can be tested using Levene's test of homogeneity of variance. An insignificant value of Levene's test ($p > .05$), implies that this research has equality of variance among the different groups. If this value is significant this assumption has been violated. The Levene's test was insignificant: $p > .05$ ($p = .106$), therefore it can be concluded that this research has equality of variances among the different groups and the assumption of homogeneity of variance is met. The results of the Levene's test can be found in Appendix 7.

5. Results

The previous chapter ensured that there were no violations of the assumptions of the ANOVA. This chapter starts with the 2 x 2 between groups (factorial) ANOVA performed to test the relationship between perceived service constellation and customer engagement behavior and the moderating influence of brand love on this relationship. The ANOVA analysis was performed based on the dependent variable customer engagement behavior (CustomerEngagement) and the fixed factors PSC (Const_Group) and brand love (Brand_Group). The first factor (Const_Group) consisted of the AH_High and Aldi_High group (representing high levels of perceived service constellation, $n = 81$) and the second factor (Brand_Group) comprised the AH_High and AH_Low group (representing high levels of brand love, $n = 90$). The last part of this chapter investigates the influence of the demographic characteristics (gender, age and education) of the sample population on the relationship between PSC, brand love and CEB with an ANCOVA procedure. Gender, age and education are used as covariates in order to establish that the results of this study do not depend on, or affected by, gender, age or education.

5.1 Direct effects of PSC and brand love on customer engagement

First, the relationship between perceived service constellation on customer engagement behavior (H1) was tested by examining the main effect of PSC on CEB. The mean scores on CEB were 3.52 for the AH_High group, 2.46 for AH_Low group, 2.35 for the Aldi_High group and 1.93 for the Aldi_Low group (see Table 12 below). There was a significant effect for PSC (Const_Group) on CEB: $F(1,167) = 52.05, p = .00$. This significant effect means that the degree to which customers perceive a service as part of a larger constellation significantly positively influences customers' engagement behavior. The partial eta squared measure was used to investigate the effect size of the treatment effect on the dependent variable. The partial eta squared measure indicates the proportion of variance that a variable explains that is not explained by other variables in the analysis (Field, 2013). The partial eta squared was .24, which illustrates that perceived service constellation explained 24% of the variance in customer engagement behavior, not attributable to other variables.

Furthermore, the ANOVA also showed that brand love (Brand_Group) had a direct significant effect on CEB: $F(1,167) = 69.14, p = .00$. Meaning, all other factors aside, the degree to which customers love a brand has a significant (positive) influence on their

engagement behavior. The partial eta squared was .29, indicating that brand love explained 29% of the variance in customer engagement behavior, not attributable to other variables. This effect can be considered as fairly large.

Overall, it can be stated that the results support the first proposition stated in this study. The degree to which a customer perceives a service as part of a larger constellation has a (significant) positive effect on the customer’s engagement behavior. Furthermore, this effect is perceived as quite large. H1 is therefore accepted. The results of the main effects are presented in Table 13 and Appendix 7.

Table 12: Mean scores customer engagement behavior per group

CUSTOMER ENGAGEMENT	HIGH BRAND LOVE	LOW BRAND LOVE
HIGH PSC	AH_High (3.52)	Aldi_High (2.35)
LOW PSC	AH_Low (2.46)	Aldi_Low (1.93)

5.2 Interaction effect between PSC and brand love on customer engagement

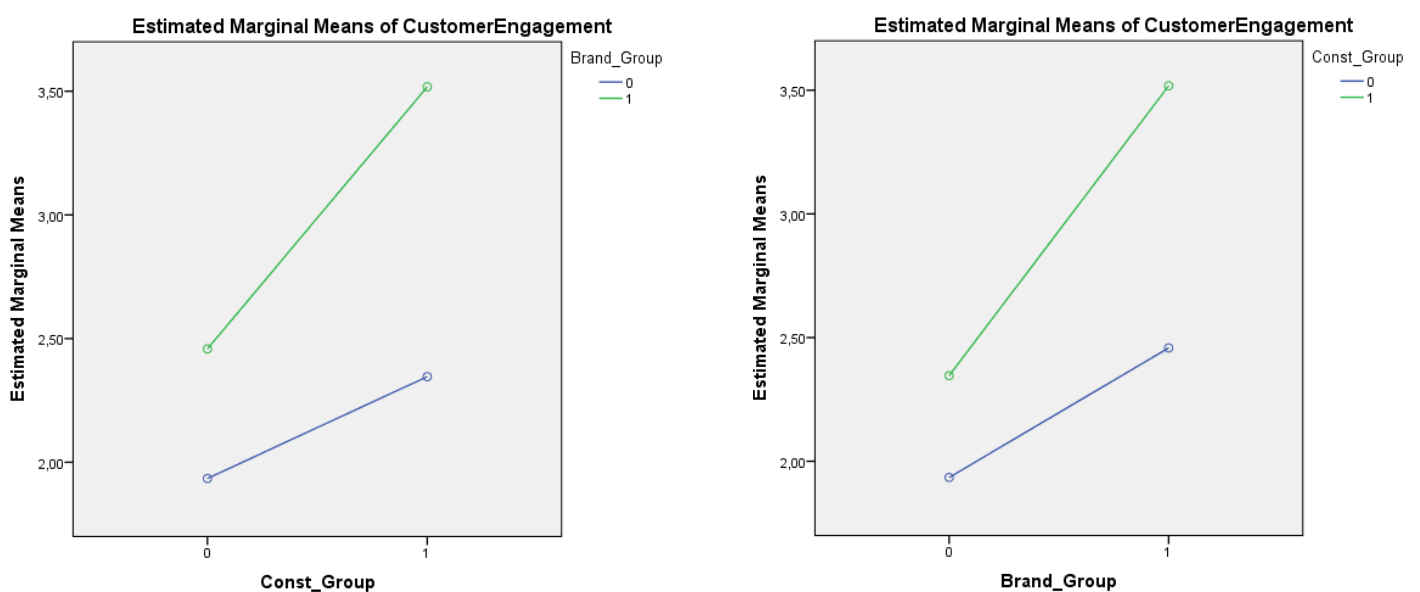
Secondly, the interaction effect between PSC and brand love (Brand_Group * Const_Group) on engagement behavior is used to investigate the influence of the moderator brand love on the relationship between PSC and CEB (see Table 13). There was a significant interaction effect between PSC and brand love on CEB: $F(3,166) = 10.10, p = .00$. The significant interaction effect means that the effect of one independent variable on the dependent variable depends on the effect (level) of the other independent variable. Meaning, either the effect of PSC on customer engagement depends on different levels of customer brand love or the effect of brand love on customer engagement depends on the degree of PSC.

Table 13: Direct and interaction effect of PSC and brand love on customer engagement

CUSTOMER ENGAGEMENT	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.	PARTIAL ETA SQUARED
BRAND_GROUP	30.552	1	30.552	69.136	.000	.292
CONST_GROUP	23.002	1	23.002	52.049	.000	.238
BRAND_GROUP* CONST_GROUP	4.461	1	4.461	10.095	.002	.057

The interaction effect does not show *which* of the two independent variables causes the interaction. However, the plots of the estimated marginal means of CEB (see Figure 2 below) might provide valuable insights in determining whether PSC or brand love causes the interaction effect and if brand love is a moderating variable. There seems to be an ordinal interaction with no crossover; the direction of change is always the same, but the two regression lines do not cross each other (Hair, 2014). The left plot shows that customer engagement is always higher towards a loved brand than to a ‘normal’ brand⁹, regardless the degree of PSC. However, the right plot shows that customer engagement is not always higher once a customer perceives high constellation opportunities compared to when the customer perceives low constellation opportunities. CEB is *not* (noticeably) higher once a customer experiences *high* constellation opportunities from a *normal* brand than when a customer experiences *low* constellation opportunities from a *loved* brand. Customer engagement is actually higher towards a loved brand with low constellation opportunities (AH_Low) compared to a normal brand with high constellation opportunities (Aldi_High).

Figure 2: Marginal means plots of customer engagement behavior



Furthermore, the mean scores on CEB show that the effect of PSC on CEB is relatively slim for a normal brand compared to the effect of PSC on CEB for a loved brand. For example, the mean engagement score is 1.93 for the Aldi_Low group, a normal brand that provides services in isolation, while the mean engagement score of a normal brand that provides services within a constellation (Aldi_High group) is around 2.35 (mean difference of

⁹ A normal brand would be one the customer is indifferent to.

.42). However, the effect of PSC on CEB becomes (much) larger once a customer derives high constellation opportunities from a loved brand. The mean score on CEB of a loved brand that provides services in isolation (AH_Low group) is around 2.46, while the mean CEB score of a loved brand that provides services within a constellation (AH_High group) is around 3.52 (mean difference of 1.06). These mean differences illustrate that the effect of PSC on CEB is larger for a loved brand than for a normal brand.

A Tukey post hoc test is used to further examine the differences between the mean CEB scores of the four groups. A Tukey post hoc test is most appropriate to use when there are equal group sizes and equal group variances (Levene's statistic $< .05$) (Field, 2013). The post test¹⁰ revealed that the mean score on CEB of the AH_High group was significantly different to all the other three groups ($p < .05$). Meaning, when a customer experiences both high levels of PSC and brand love it results in significantly higher levels of engagement behavior than when a customer experiences only a high level of perceived service constellation, brand love or neither. Furthermore, the mean score on engagement behavior of the AH_Low group was significantly different to that of the Aldi_Low group ($p < .05$). This implicates that customer engagement behavior is positively affected once a customer experiences low constellation opportunities from a loved brand compared to when the customer experiences low constellation opportunities from a normal brand.

Moreover, the difference between the mean score on CEB of the Aldi_High group compared to that of the Aldi_Low group was also significant ($p < .05$). This result demonstrates that customers' PSC has a significant positive effect on customers' engagement behavior. For both a loved and normal brand, engagement behavior is significantly higher if the customer experiences high constellation opportunities than when the customer experiences low constellation opportunities from that same brand. However, the mean score on CEB of the AH_Low group was not significantly different to the Aldi_High group ($p = .86$). This means that it does not influence CEB significantly whether a customer perceives high levels of PSC when generated from a normal brand than when a customer perceives low levels of PSC from a loved brand.

Overall, it can be concluded that brand love has a significant influence on CEB. Customer engagement is always higher towards a loved brand than towards a normal brand, regardless the degree of perceived service constellation. Furthermore, the results show that the

¹⁰ The 'Group' variable (containing all four groups) is used for the post hoc test, as it allowed to investigate the differences between the mean scores on engagement behavior for all four groups individually.

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effect that PSC has on CEB depends on the customer’s brand love. The effect that PSC has on CEB becomes noticeably larger once the customer derives constellation opportunities from a loved brand than when the customer derives these constellation opportunities from a normal brand. The positive effect that PSC has on CEB is indeed positively moderated by customers’ brand love. Therefore, H2 is accepted. The results of the ANOVA and post hoc procedure are respectively displayed in Table 13 and 14. These results can also be found in Appendix 7.

Table 14: Tukey post hoc test per group

	SCENARIO	MEAN	STD. ERROR	SIG.
DIFFERENCE				
TUKEY HSD				
AH_HIGH	AH_Low	1.0595	.140	.000
	Aldi_High	1.1717	.148	.000
	Aldi_Low	1.5833	.145	.000
AH_LOW	AH_High	-1.060	.140	.000
	Aldi_High	.1122	.143	.862
	Aldi_Low	.5238	.140	.001
ALDI_HIGH	AH_High	-1.172	.148	.000
	AH_Low	-.1122	.143	.862
	Aldi_Low	.4116	.148	.030
ALDI_LOW	AH_High	-1.583	.145	.000
	AH_Low	-.5238	.140	.001
	Aldi_High	-.4116	.148	.030

5.3 Demographic control variables

The last part of this chapter investigates the influence of the demographic characteristics (gender, age and education) of the sample population on the relationship between perceived service constellation, brand love and customer engagement behavior. This analysis is done in order to conclude that the results of this study did not depend on or were affected by the respondent's gender, age or education. Therefore, three three-way ANCOVA procedures were conducted while using the variables gender, age and education as covariates. In that way, the effects of PSC and brand love on engagement behavior could be examined, while controlling for the influence of the respondent's gender, age and education.

Covariates need to be measured on a metric scale and since the variables gender, age and education were non-metric variables, they were transformed into dummy variables (Field, 2013). The variable age was transformed into 1 = 'young' (age categories 15 – 35 years) and 0 = 'old' (all age categories above 35 years). The variable education was transformed into 1 = high education (categories HBO and WO) and 0 = low education (all other education categories). The variable gender was transformed into 1 = male and 0 = female.

The covariates gender (Gender_Dummy), age (Age_Dummy) and education (Education_Dummy) were all not significantly related to customers' engagement behavior. Gender: $F(1,166) = 1.00$, $p = .32$, partial eta squared of .01. Age: $F(1,166) = .12$, $p = .73$, partial eta squared of .00. Education: $F(1,166) = .01$, $p = .93$, partial eta squared of .00. Therefore, it can be concluded that neither gender, nor age or education influenced customers' engagement behavior and that the results of this study did not dependent on the demographic characteristics of the respondent. The results of these three ANCOVAs are presented in Table 15 and Appendix 8.

Table 15: ANCOVA results for the demographic control variables gender, age and education

CUSTOMER ENGAGEMENT	SUM OF SQUARES	DF	MEAN SQUARE	F	SIG.	PARTIAL ETA SQUARED
GENDER	.441	1	.441	.998	.319	.006
AGE	.053	1	.053	.119	.731	.001
EDUCATION	.003	1	.003	.007	.931	.000

6. DISCUSSION

In the previous chapter, the results of the two-way ANOVA analysis were reported. These results help to extend the understanding of customers' perceptions towards service constellations and their resulting engagement behavior. This chapter further explains the results of the analysis and how they relate to the expectations stated in the previous chapters.

The results of the ANOVA analysis support the expectation that the degree to which a customer perceives a service as part of a larger constellation enhances the customer's engagement behavior. Additionally, it was found that customer brand love positively moderated the effect of PSC on engagement behavior. Once a customer experiences both high levels of PSC and brand love, this results in higher levels of engagement behavior compared to when a customer experiences only PSC, brand love or neither. The results show that the customer's willingness to engage is not solely based on the value creation potential of complementary and supportive services. Customer engagement is also influenced by the emotional attachment a customer has to a brand, due to brand's meaning and its ability to connect its brand symbols to the service (constellation) experience. The combination of the product, the brand and its meaning result in engaged customers. As a result, loved brands that construct their services as part of a larger constellation have the most chance of creating engaged customers and vice versa. Normal brands, that do not construct their services as part of a larger constellation, are least likely of creating engaged customers.

Furthermore, the results reveal that the customer's constellation perception had a significant positive effect on the customer's engagement behavior. CEB is significantly higher for a brand with high constellation opportunities than for the *same* brand with low constellation opportunities. This is in line with the statements of Prahalad and Ramaswamy (2004) and Vargo and Lusch (2004). These authors state that in order to create satisfied and loyal customers, firms must focus on delivering unique value propositions. Nevertheless, this does not always seem to be the case. The results indicate that it does not influence customer engagement whether a customer perceives high constellation opportunities when it is generated from a normal brand than when a customer perceives low constellation opportunities from a loved brand.

The effect of PSC (high vs. low) of *different* brands on customer engagement seems to be influenced (moderated) by the customer's brand love. When a loved firm provides low levels of PSC and a normal brand provides high levels of PSC, customer engagement behavior towards the two firms is not expected to differ. This implies that brand love fills the

gap in perceived service constellation between different brands, which is in line with the propositions of this study and the findings of Batra et al. (2012) and Carrol and Ahuvia (2006). These authors stated that customer behavior (towards a firm) is likely to be influenced by the customer's brand love. Additionally, this study expands these findings by declaring that the emotional connection a customer has with a brand creates a veritable 'blind-spot' in the customer's mind towards the value proposition of other brands. A normal brand can deliver a remarkably supportive and complementary product, but that still does not have to mean that the customer is more willing to engage with that firm than when a loved firm delivers an isolated product.

Likewise, brand love seems to have a significant impact on the customer's willingness to engage, *regardless* if the customer experiences high or low constellation opportunities. Customers were more willing to engage with a *loved* firm when it provided *high* constellations opportunities than when a *normal* brand provided high constellation opportunities. Moreover, customers were also more willing to engage with a *loved* firm when it provided *low* constellation opportunities than when a *normal* brand did so. Concluding, customer brand love has a crucial influence on the relationship between the PSC and customer engagement. Two service providers can offer the exact same product, but customer engagement will always be higher towards the business the customer has an emotional connection with.

However, the results also designate that customers might be more demanding towards a loved brand than towards a normal brand. Therefore, loved brands might face more negative fallout in cases of failure; when they do not meet the customer's standards and do not live up to the customer's expectations, compared to normal brands. This is corresponding with the findings of Van Doorn et al. (2010). These authors declared that brands with high brand equity are likely to engender high levels of positive CEB. However, in cases of failure, the negative fallout in terms of CEB may be higher as well. If a brand with relatively high brand equity fails, it may lead to disproportionately higher levels of disappointment than when a comparable brand with lower brand equity fails.

As mentioned, the difference between the mean scores on engagement behavior for the AH_High and the AH_Low group (1.06) was relatively much larger compared to that of the Aldi_High and Aldi_Low group (0.42). These results suggest that customers might be less 'forgiving' towards loved brands, which is contradictorily to the statements made in this study. Loved brands were expected to have an extensive 'tolerance' level. A loved brand was ought to be more allowed to make mistakes than a normal brand, without influencing

customers' engagement compared to a normal brand or a brand with merely a good image. The results of this study argue that this might not be the case. Customers have extremely high expectations of loved brands and once the brand fails to live up to that expectation, it may hurt their customers' willingness to engage.

Nevertheless, this study debates that there is another side to the story, because the probability of a loved brand failing (not delivering valuable products) is slim. Loved brands do not easily become loved and certainly do not become loved overnight. In order to establish a deeply rooted emotional connection and brand engagement with customers, these brands commit their entire business operations on creating long-term brand relationships and organizational learning. Loved brands invest significant amounts of time and energy in establishing frequent customer-firm interactions, getting to know their customers, learning from them and creating personalized customer experiences. For this reason, the likelihood of a loved firm failing is decisively smaller compared to that of a normal brand or a brand with a good brand image. Loved brands understand latent customer needs and are therefore more able to deliver unique value to their customers. Loved brands know how to distinct themselves from competitors and create engaged customers.

7. CONCLUSION

The last chapter of this research starts with a short summary. Thereafter, the contribution of the findings of this research to the scientific literature and managerial practice are described and the limitations of this study are addressed. At last, several suggestions for further research are provided.

7.1 Summary

One of the most established findings from marketing, innovation and customer behavior research is that customers today have more choices of products and services than ever before, but they seem dissatisfied. Businesses continue to invest in greater product variety, but they are less able to differentiate themselves (Prahalad & Ramaswamy, 2004). Organizational growth and value creation have become dominant, yet challenging themes for managers and the innovation practice. The meaning of value and the process of value creation are rapidly shifting from a firm- to customer-centric view to personalized customer experiences. Nowadays, customers seek to co-create value with suppliers. The interaction between the firm and the consumer is becoming the locus of value creation and value extraction (Prahalad & Ramaswamy, 2004).

In this paper, the meaning of value and the process of value creation are explained from a service constellation perspective. This paper contributed to the scientific literature by giving a new dimension to the value creation process and customer co-creation of value. Therefore, this research stressed the need for businesses to focus on the unique value propositions of service constellations, and the ability it provides businesses to co-create value with their customers, by creating engaged customers. Customers who help the firm learn and grow and become co-creators of value in the innovation of current and creation of new services.

This study stated that the unique value propositions of service constellations stimulate customers to get engaged with the firm by not only creating more customer value, but also by shaping the dynamic field for customer-brand relationship building. Service constellations enable customers to get connected and involved with a firm, as the fragmented nature of a constellation constructs opportunities for customers to become co-producers. The goal of this study was to generate more profound insights on the influence of customers' perceived degree of service constellation on their engagement behavior, while taking customers' brand love into account. Therefore, this study formulated two hypotheses investigating the effect of

customers' perceived degree of service constellation (PSC) on their engagement behavior (H1) and the moderating effect of customer brand love on this relationship (H2).

A two-way between subjects ANOVA, using a 2 x 2 differential experimental design, showed that degree to which a customer perceived a service as part of a larger constellation had a significant positive effect on the customer's engagement behavior towards the firm. When a customer experienced high constellation opportunities¹¹, this positively affected the customer's willingness and motivation to engage. Additionally, there was found to be a significant interaction effect between PSC and customer brand love on customer engagement behavior. Further investigation of the marginal means plots and post hoc test revealed that brand love caused the interaction effect on customer engagement. The effect of PSC on customer engagement depended on the customer's brand love. The effect that PSC had on customer engagement became noticeably larger once the customer derived constellation opportunities from a loved brand than when the customer derived these constellation opportunities from a normal brand. Therefore, it was concluded that the customer's emotional connection with a brand moderated the relationship between PSC and customer engagement behavior.

7.2 Implications for theory

Researchers have broadly examined the dynamic field of value creation between customers and suppliers and the importance of co-creation of value for overall organizational success. The service-dominant logic is the well acknowledged resulting theoretical framework stressing the need for customers to become co-creators of value. The service-dominant logic emphasizes the development of customer-supplier relationships through interaction and dialog and mutual value creation (Vargo & Lusch, 2004). Inter alia research of Prahalad and Ramaswamy and Vargo and Lusch (2004) demonstrated that the value creation process in the 21st century shifts to customer experiences, where the market is becoming a form for conversation and interaction. They highlighted the need for businesses to provide more unique value to customers, in order to get informed, empowered and active customers involved in the businesses and co-create value. Research from Van Doorn et al. (2010) expanded these theories by suggesting a more integrative and comprehensive approach to achieving co-creation of value. Van Doorn et al. (2010) articulated co-creation of value as a

¹¹ The customer was able to integrate different, supportive services within a constellation with each other, resulting in synergetic benefits.

result from the evolution and impact of customer engagement behavior. Customer engagement is viewed as the integral and essential part of process brought into life due to care and commitment to a business. It is grounded in the act of reciprocity or mutual benefit; the customer's commitment to a business in order to help it improve and innovate its services (Van Doorn et al., 2010).

However, what the service innovation literature has been slow to acknowledge is that nowadays, value creation should be built upon the perception that a valuable service is always interdependent on other services. Moreover, service science and managers seem to overlook the fact that customers increasingly experience and value services as elements of a larger constellation of mutually facilitating, complementary and supportive services. This study expands the current scientific literature as it explores the manner in which customers use and experience services and how they value a service within the context of a service constellation. Furthermore, this work combines fundamental propositions of the S-D logic and theoretical framework of Van Doorn et al. (2010), as it argues that service constellations provide unique opportunities for achieving co-creation of value by creating engaged customers. Service constellations synthesize an intensive cooperation and education process between customers and suppliers and are therefore structured around the art of mutual beneficial value creation.

First of all, this study illustrates that service constellations allow customers to conveniently integrate complementary and supportive services, saving them time, energy and effort, resulting in more customer value. Customers who experience high constellation opportunities are more likely to become engaged with the firm, because customers feel that the business is worth their time and that they are getting something in return (act of reciprocity). Secondly, this study demonstrates that service constellations stimulate customers to engage, as the fragmented nature of interrelations between services in the constellation shape the path for a transparent dialogue between businesses and customers. All the actors in the eco system of a service constellation need each other for the constellation to exist and flourish. As a result, a successful service constellation requires far-reaching coordination and cooperation between customers and suppliers (Van Riel et al, 2013). It is this dialogue, access, transparency and cooperation that is central to the practice of value creation and what makes service constellations so competitive. Value in constellations is derived from the fragmented nature of services, the interrelations between these services, the integration abilities it provides customers. The interdependent nature of services within a constellation create the opportunity for customers to get involved with the firm, become co-producers, and ultimately co-create value.

7.3 Implications for practice and recommendations

The previously mentioned results of this research have several implications for service managers and innovation practitioners, particularly in the process of value creation and the use of customers within innovation practice. First of all, service managers must escape the firm-centered view of the 20th century and embrace the importance of customer involvement and engagement in business operations. Firms need to co-create value with their customers. The time of businesses dictating and controlling the market is long gone. Listening to customers is the only way to guarantee creating a service that customers actually want to buy. Innovation managers should use their customers to improve and innovate their service systems. Nowadays, business success revolves around the guidance of active, empowered and engaged customers in service innovation.

Secondly, with the current market shifting to personalized customer experiences, suppliers no longer *determine* value for customers, but *assist* the customer in the value creation process. Value creation is more improvisational, reacting to emergent opportunities, creating dependencies on other goods. The metrics of organizational success finds new ways in the adoption of the service constellation perspective. The benefits of service constellations thrive through the mutual interests of its users and providers (Van Riel et al., 2013). Clearly, the service constellation concept has major implications for the organization and management of innovation processes. Service managers should implement a more network-based approach to innovation. Innovation should be designed and centered around the alignments between different services. Therefore, service managers need to reach out to other actors (customers and service providers) in the eco-system to complement the constellation. Moreover, firms need to continuously search for updated information about future states of service constellations. Consequently, the information and knowledge-sharing infrastructure of the business need to be organized and adapted appropriately (Van Riel et al., 2013).

Thirdly, service managers should take the importance and relevance of their brand in service development and innovation into account. Interdependency between services are valuable in itself, but the ultimate service (constellation) experience is determined by the conjoined interconnections between a ventures value proposition and its brand. The relationship between the brand's symbols (it's product, retail stores, logo, leadership style and vision) enrich the overall customer experience. It expresses what the organization stands for, represents how it will act now and in the future and is vital for establishing brand engagement; customers weaving the brand's symbols into their life's (Hatch & Schultz,

2008). The interconnections between the brand's symbols all affect and complement each other and comprise into a constellation on its own. A constellation *within* a constellation is the greatest driver for customer engagement and constructive co-creation.

Closing, managers in search of competitive advantage need to adopt a co-creation perspective to their business operations to encourage more active involvement from customers in the value creation process. Managers can start doing so by always considering the value creating abilities of a service interdependent on other services and develop services as part of a larger constellation. Additionally, businesses need to seek engaged customers and use their brand during this process. Obtaining business intelligence through customers and connecting those insights to improve and innovate service systems, empowers firms to co-create value with their customers and achieve competitive advantage.

7.4 Limitations

This research has several limitations, which do have some implications on the findings. First of all, the diversity of the sample population of this study is limited. Most of the respondents (86%) were between 15 and 25 years old and more than half (66%) had an educational level of HBO/WO. This indicates that the sample mainly represents young (more tech savvy) adults. Therefore, the results might not be generalizable to people outside this group and the middle or lower educated.

A second limitation is that the experiment used in this research priority categorized the supermarkets Albert Heijn and Aldi as respectively a loved and normal brand. Research from the Consumentenbond (2014) and the manipulation checks used in Chapter 3 implied that Albert Heijn was indeed a more loved supermarket in the Netherlands than the Aldi. However, it was not established that these brands represented the respondent's emotional connection with a brand just as well, as when the respondent was allowed to choose a brand on their own. Furthermore, the questionnaire did not measure whether or not the respondent already bought or used products from Albert Heijn or the Aldi. Perhaps, doing so would have generated more detailed insights about the respondent's relationship with the respective supermarket.

Furthermore, the questionnaire obtained an extra item asking the respondents whether or not they thought the experienced scenario was realistic (likely of happening in the real world). This item was measured on a 5-point Likert-scale ranging from 1 (totally unrealistic) to 5 (totally realistic). The mean scores on this item differed from 2.40 – 2,80 (between disagree and neutral), which implies that respondents did not perceive the four scenarios as

realistic. Although, the differences between these mean scores were not significant ($p > .05$), meaning that the respondents did not perceive the different scenarios as being unequally (un)realistic, these low scores might have hurt the validity of this research.

7.5 Suggestions for future research

The findings of this research raise a number of issues that are worth investigating in the future. This study is the first in adopting a service constellation perspective to co-creation of value and one of few that illustrated how service innovation from a constellation perspective requires a far-reaching, cooperative process between customers and suppliers. This study tried to provide more detailed insights on the manner in which costumers use and experience services and how they value a service within the context of a service constellation. Therefore, the goal of this study was to generate more profound insights on the effect of customers' perceived degree of service constellation on their engagement behavior, while taking customers' brand love into account. However, there are still many effects to explore, especially in the field of service constellations.

First of all, more research is required to map the underlying service systems of constellations; the actors that may be involved in the creation and existence of service constellation and their roles and activities (Van Riel et al., 2013). For example, this paper stresses the need for firms to include customers in their innovation processes. However, a further developed understanding of the exact role of customer involved in this process (e.g., in which stages of the development and/or innovation process of service constellations customers should be involved) is desired. Van Riel et al. (2013) recommend using role theory for studying the underling service systems, as role theory focuses on understanding behavior in social settings, such as actors in service systems.

On that note, the ecosystem management of service constellations also requires more attention. Since service constellations involve complex relationships between multiple actors, it is worth examining how actors react to specific changes in the service system. Ecosystem management continues to be a difficult aspect of the innovation process. Little control results in chaos, but too much control may inhibit innovation (Van Riel et al., 2013). Van Riel et al. (2013) suggest using agent-based modelling to help understand the power distributions in the service systems of service constellations.

At last, a potential direction for future research is the study of the structural characteristics of services in service constellations. According to Van Riel et al. (2013), the ecosystem structure in constellations may be partly virtual in nature. The development of

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technical and network capabilities (e.g., virtual cooperation using web 3.0 tools) in the current high-tech business world, and its implications for successful evolution of service constellations, might be particularly interesting.

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APPENDICES

Appendix 1: Experimental design

Scenario 1: Albert Heijn

- + constellation
- + customer brand love

De Albert Heijn heeft enige tijd geleden haar eigen ontwikkelde tablet en laptop op de markt gebracht. De tablet en laptop waren zo'n succes dat de Albert Heijn nu ook haar eigen smartphone aan het ontwikkelen is.

De Albert Heijn smartphone werkt, net zoals de tablet en laptop, op door Albert Heijn ontwikkelde soft- en hardware. De smartphone heeft een strak, fraai design. De smartphone, laptop en tablet opereren via hetzelfde besturingssysteem, wat resulteert in complementaire functionaliteit voor gebruikers van deze producten. Wanneer u bijvoorbeeld gebeld wordt op de Albert Heijn smartphone, kunt u dit gesprek opnemen en voeren via de Albert Heijn laptop of tablet. Daarnaast werkt de Albert Heijn intensief samen met o.a. diverse vliegtuigmaatschappijen, Nederlandse banken en de NS. Hierdoor ondersteunt de Albert Heijn smartphone functies zoals internetbankieren, contactloos betalen en kunt u met de smartphone reizen met het vliegtuig en het openbaar vervoer.

Scenario 2: Aldi

- + constellation
- - customer brand love

De Aldi heeft enige tijd geleden haar eigen ontwikkelde tablet en laptop op de markt gebracht. De tablet en laptop waren zo'n succes dat de Aldi nu ook haar eigen smartphone aan het ontwikkelen is.

De Aldi smartphone werkt, net zoals de tablet en laptop, op door Aldi ontwikkelde soft- en hardware. De smartphone heeft een strak, fraai design. De smartphone, laptop en tablet opereren via hetzelfde besturingssysteem, wat resulteert in complementaire functionaliteit voor gebruikers van deze producten. Wanneer u bijvoorbeeld gebeld wordt op de Aldi smartphone, kunt u dit gesprek opnemen en voeren via de Aldi laptop of tablet. Daarnaast werkt de Aldi intensief samen met o.a. diverse vliegtuigmaatschappijen,

Nederlandse banken en de NS. Hierdoor ondersteunt de Aldi smartphone functies zoals internetbankieren, contactloos betalen en kunt u met de smartphone reizen met het vliegtuig en het openbaar vervoer.

Scenario 3: Albert Heijn

- - constellation
- + customer brand love

De Albert Heijn heeft enige tijd geleden haar eigen ontwikkelde tablet en laptop op de markt gebracht. De tablet en laptop waren zo'n succes dat de Albert Heijn nu ook haar eigen smartphone aan het ontwikkelen is. De ontwikkeling van de telefoon (ontwerp, productie, distributie ect.) is ruim een half jaar geleden begonnen. De verwachting is dat de smartphone over twee maanden in de schappen ligt.

De Albert Heijn smartphone werkt, net zoals de tablet en laptop, op door Albert Heijn ontwikkelde soft- en hardware. De smartphone, laptop en tablet opereren dan ook via hetzelfde besturingssysteem. Het is een basis smartphone waarmee u kunt bellen, sms'en en internetten.

Scenario 4: Aldi

- - constellation
- - customer brand love

De Aldi heeft enige tijd geleden haar eigen ontwikkelde tablet en laptop op de markt gebracht. De tablet en laptop waren zo'n succes dat de Aldi nu ook haar eigen smartphone aan het ontwikkelen is. De ontwikkeling van de telefoon (ontwerp, productie, distributie ect.) is ruim een half jaar geleden begonnen. De verwachting is dat de smartphone over twee maanden in de schappen ligt.

De Aldi smartphone werkt, net zoals de tablet en laptop, op door Aldi ontwikkelde soft- en hardware. De smartphone, laptop en tablet opereren dan ook via hetzelfde besturingssysteem. Het is een basis smartphone waarmee u kunt bellen, sms'en en internetten.

Appendix 2: Questionnaire

Beste respondent,

Ik ben een vierdejaars Bedrijfskunde student aan de Radboud Universiteit in Nijmegen en volg op het moment de master Innovation & Entrepreneurship. Deze enquête is een onderdeel van mijn masterthesis en heeft als doel te achterhalen hoe u als klant tegen verschillende producten en bijbehorende constellaties aankijkt. Een constellatie is de combinatie van meerdere, wederzijds afhankelijke producten of diensten die samen meer waarde creëren voor de klant dan de som van de individuele, geïsoleerde producten bij elkaar. Dat wil zeggen dat de waarde van één product afhangt van andere, ondersteunende producten en dat de totale constellatie (al deze producten bij elkaar) de klant extra, complementaire voordelen biedt.

Het invullen van de vragenlijst zal c.a. 5 minuten duren en is gebaseerd op een fictieve casus over een supermarkt: de Albert Heijn of de Aldi. Uw antwoorden zijn volledig anoniem. Door het invullen van deze vragenlijst geeft u toestemming tot anonieme en geaggregeerde verwerking van uw antwoorden. De antwoorden zullen uitsluitend voor onderzoeksdoeleinden gebruikt worden en het is dan ook zeer belangrijk dat u naar waarheid antwoordt. Er zijn geen goede of foute antwoorden.

Alvast bedankt!

Robin Rudolphie

(Mocht u nog vragen of opmerkingen hebben dan kunt u deze mailen naar robin.rudolphie@student.ru.nl.)

CASUS

Lees de bovenstaande casus goed. Beeld u in dat u op zoek bent naar een nieuwe smartphone. Geef aan in welke mate u vindt dat de volgende 6 stellingen overeenkomen met de casus.

Q1 De smartphone van de Albert Heijn/Aldi ondersteunt andere (externe) diensten (bijv. reizen, betalen/bankieren).

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q2 De smartphone van de Albert Heijn/Aldi maakt verreikende samenwerking tussen verschillende service providers (andere bedrijven) mogelijk.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q3 De smartphone van de Albert Heijn/Aldi zou mij in staat stellen om gemakkelijk verschillende (externe) diensten (bijv. reizen, betalen/bankieren) met elkaar te integreren.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Q4 De smartphone van de Albert Heijn/Aldi zou meerdere, verschillende aspecten in mijn leven (bijv. reizen, betalen/bankieren) verbinden en combineren.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q5 De smartphone van de Albert Heijn/Aldi zou mij veel tijd, energie en moeite besparen.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q6 De smartphone van de Albert Heijn/Aldi zou zeer waardevol voor mij zijn.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Geef aan in hoeverre u het eens/oneens bent met de volgende stellingen.

Q7 De Albert Heijn/Aldi symboliseert (vertegenwoordigt) mijn persoonlijkheid (mijn karakter, normen en waarden).

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Q8 De Albert Heijn/Aldi is een verlengde van mijn persoonlijkheid (mijn karakter, normen en waarden).

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q9 Door de Albert Heijn/Aldi voel ik mij echt verbonden met andere mensen.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q10 Door de Albert Heijn/Aldi voel ik mij echt onderdeel van een grotere (sociale) gemeenschap.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q11 Ik zou heel graag meer leren/te weten komen over de Albert Heijn/Aldi.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Bij de volgende vragen wordt met het woord 'producten' de Albert Heijn/Aldi smartphone, laptop en tablet bedoelt.

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Q12 Ik zou veel aandacht besteden aan nieuws over de Albert Heijn/Aldi (bijv. door te kijken naar reclames of folders over korting op de Albert Heijn/Aldi smartphone).

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q13 Ik zou bereid zijn om veel tijd en middelen (geld) te besteden aan producten van de Albert Heijn/Aldi.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q14 Ik verlang meer producten van de Albert Heijn/Aldi.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q15 De Albert Heijn/Aldi is zeer waardevol voor mij.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Q16 De Albert Heijn/Aldi maakt mijn leven veel aangenamer.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q17 Ik zou mij zeer op mijn gemak voelen wanneer ik producten bij de Albert Heijn/Aldi koop of producten van de Albert Heijn/Aldi gebruik.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q18 Ik voel een sterke vorm van 'natuurlijke fit' met de Albert Heijn/Aldi.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q19 Wanneer ik iets slechts/negatiefs zou horen over de Albert Heijn/Aldi, zou ik dat nieuws betwijfelen/niet geloven.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Q20 De mate waarin mensen in mijn omgeving producten bij de Albert Heijn/Aldi kopen of gebruik maken van producten van de Albert Heijn/Aldi, zou mij totaal niet beïnvloeden in het kopen van producten bij de Albert Heijn/Aldi of het gebruik maken van producten van de Albert Heijn/Aldi.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer eens (5)

Q21 Ik zou zeker voor een lange tijd producten bij de Albert Heijn/Aldi blijven kopen of gebruik blijven maken van producten van de Albert Heijn/Aldi.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q22 De Albert Heijn/Aldi zou zeker onderdeel van mijn leven zijn in de toekomst.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q23 Ik zou zeker bereid zijn om mijzelf te verbinden aan de Albert Heijn/Aldi door te reflecteren op bestaande producten/diensten van de Albert Heijn/Aldi.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q24 Ik zou zeker gemotiveerd zijn om de Albert Heijn/Aldi te laten weten wat er aan haar huidige producten of diensten verbeterd kan worden, omdat mijn inbreng de Albert Heijn/Aldi kan helpen haar producten te verbeteren/te vernieuwen.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q25 Ik zou zeker de Albert Heijn/Aldi helpen zich te vernieuwen en te verbeteren door mijn eigen ideeën voor nieuwe producten met de Albert Heijn/Aldi te delen.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

Q26 Ik zou zeker contact opzoeken met de Albert Heijn/Aldi om samen nieuwe, waardevolle producten te creëren.

- Zeer oneens (1)
- Oneens (2)
- Neutraal (3)
- Eens (4)
- Zeer Eens (5)

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Q27 In hoeverre vindt u het voor uw geschetste scenario (de smartphone, laptop en tablet van de Albert Heijn/Aldi) realistisch?

- Totaal onrealistisch (1)
- Onrealistisch (2)
- Niet onrealistisch/niet realistisch (3)
- Realistisch (4)
- Zeer realistisch (5)

Q28 Wat is uw geslacht?

- Man (1)
- Vrouw (2)

Q29 Wat is uw leeftijd?

- 15 - 25 jaar (1)
- 26 - 35 jaar (2)
- 36 - 45 jaar (3)
- 46 - 55 jaar (4)
- 56 - 65 jaar (5)

Q30 Wat is uw hoogst voltooide opleiding?

- Geen onderwijs (1)
- Basisonderwijs, lagere school (2)
- VMBO/MBO 1 (3)
- HAVO/VWO (4)
- MBO 2-4 (5)
- HBO (6)
- WO (7)

Appendix 3: Manipulation checks

Manipulation check perceived service constellation:

Descriptives

PSC

					95% Confidence Interval for			
					Mean			
					Lower Bound	Upper Bound		
AH_High	42	3,8155	,34064	,05256	3,7093	3,9216	3,00	4,50
AH_Low	48	2,1302	,82834	,11956	1,8897	2,3707	1,00	3,75
Aldi_High	39	3,8269	,59092	,09462	3,6354	4,0185	2,75	5,00
Aldi_Low	42	2,3988	,89043	,13740	2,1213	2,6763	1,00	4,00
Total	171	2,9971	1,05405	,08061	2,8380	3,1562	1,00	5,00

Test of Homogeneity of Variances

PSC

Levene Statistic	df1	df2	Sig.
16,699	3	167	,000

ANOVA

PSC

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	106,091	3	35,364	71,340	,000
Within Groups	82,783	167	,496		
Total	188,874	170			

Multiple Comparisons

Dependent Variable: PSC

Games-Howell

					95% Confidence Interval	
					Lower Bound	Upper Bound
AH_Low	1,68527*	,13060	,000	1,3408	2,0298	
Aldi_High	-,01145	,10824	1,000	-,2975	,2746	
Aldi_Low	1,41667*	,14711	,000	1,0264	1,8069	
AH_High	-1,68527*	,13060	,000	-2,0298	-1,3408	
Aldi_High	-1,69671*	,15247	,000	-2,0964	-1,2970	
Aldi_Low	-,26860	,18213	,457	-,7460	,2088	

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

	AH_High	,01145	,10824	1,000	-,2746	,2975
Aldi_High	AH_Low	1,69671*	,15247	,000	1,2970	2,0964
	Aldi_Low	1,42811*	,16683	,000	,9893	1,8669
	AH_High	-1,41667*	,14711	,000	-1,8069	-1,0264
	AH_Low	,26860	,18213	,457	-,2088	,7460
	Aldi_High	-1,42811*	,16683	,000	-1,8669	-,9893

*. The mean difference is significant at the 0.05 level.

Manipulation check Brand love:

Descriptives

BrandLove

					95% Confidence Interval for			
					Mean			
					Lower Bound	Upper Bound		
AH_High	42	2,8631	,70214	,10834	2,6443	3,0819	1,63	4,75
AH_Low	48	2,8203	,72563	,10474	2,6096	3,0310	1,00	4,50
Aldi_High	39	2,1218	,63121	,10107	1,9172	2,3264	1,00	3,75
Aldi_Low	42	2,1339	,71215	,10989	1,9120	2,3559	1,00	3,75
Total	171	2,5029	,77672	,05940	2,3857	2,6202	1,00	4,75

Test of Homogeneity of Variances

BrandLove

Levene Statistic	df1	df2	Sig.
,340	3	167	,796

ANOVA

BrandLove

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	21,667	3	7,222	14,910	,000
Within Groups	80,894	167	,484		
Total	102,561	170			

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Multiple Comparisons

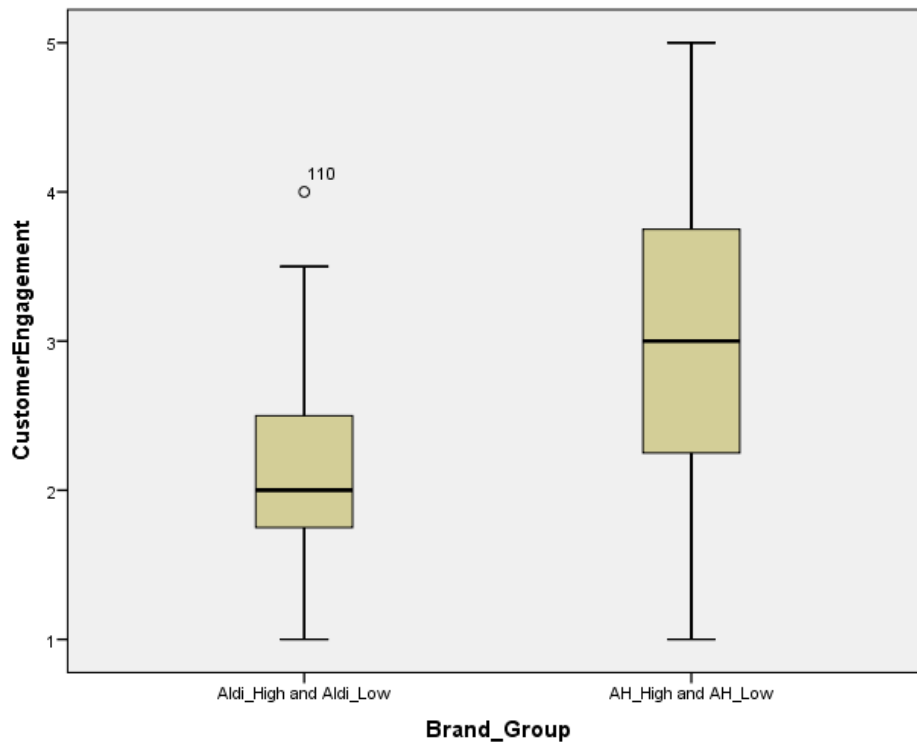
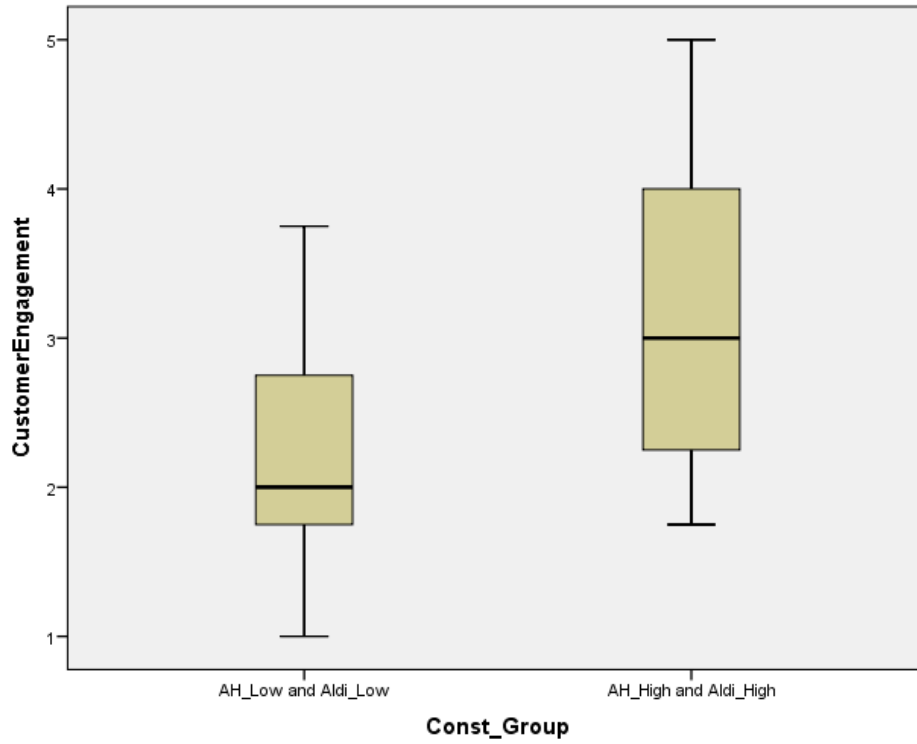
Dependent Variable: BrandLove

Tukey HSD

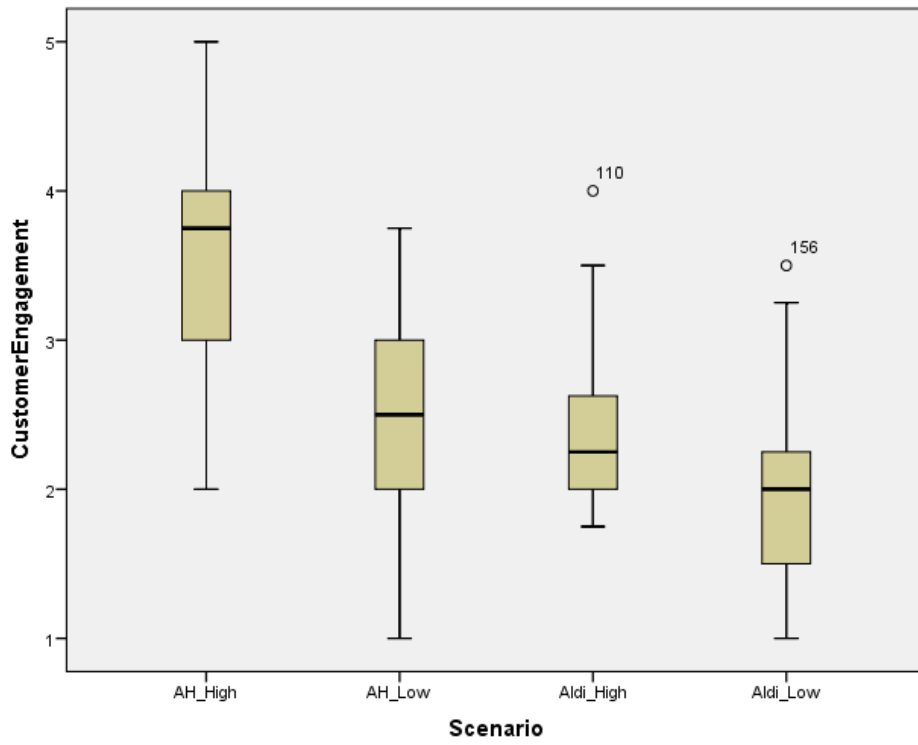
				95% Confidence Interval	
				Lower Bound	Upper Bound
AH_Low	,04278	,14705	,991	-,3388	,4244
Aldi_High	,74130*	,15477	,000	,3397	1,1429
Aldi_Low	,72917*	,15188	,000	,3350	1,1233
AH_High	-,04278	,14705	,991	-,4244	,3388
Aldi_High	,69852*	,15004	,000	,3092	1,0879
Aldi_Low	,68638*	,14705	,000	,3048	1,0680
AH_High	-,74130*	,15477	,000	-1,1429	-,3397
AH_Low	-,69852*	,15004	,000	-1,0879	-,3092
Aldi_Low	-,01213	,15477	1,000	-,4138	,3895
AH_High	-,72917*	,15188	,000	-1,1233	-,3350
AH_Low	-,68638*	,14705	,000	-1,0680	-,3048
Aldi_High	,01213	,15477	1,000	-,3895	,4138

*. The mean difference is significant at the 0.05 level.

Appendix 4: Outliers total data set



CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE



Appendix 5: Descriptive statistics total data set

Gender				
	Frequency	Percent	Valid Percent	Cumulative Percent
Male	68	39,8	39,8	39,8
Female	103	60,2	60,2	100,0
Total	171	100,0	100,0	

Age				
	Frequency	Percent	Valid Percent	Cumulative Percent
15 - 25 years	147	86	86	86,0
26 - 35 years	9	5,3	5,3	91,2
36 - 45 years	1	,6	,6	91,8
46 - 55 years	10	5,8	5,8	97,7
56 - 65 years	4	2,3	2,3	100,0
Total	171	100,0	100,0	

Education				
	Frequency	Percent	Valid Percent	Cumulative Percent
VMBO/MBO 1	1	,6	,6	,6
HAVO/VWO	57	33,3	33,3	33,9
MBO 2 - 4	1	,6	,6	34,5
HBO	31	18,1	18,1	52,6
WO	81	48,0	48,0	100,0
Total	171	100,0	100,0	

Between-Subjects Factors		
	Value Label	N
1	AH_High	42
2	AH_Low	48
3	Aldi_High	39
4	Aldi_Low	42

Appendix 6: Normality assumption

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Residual for CustomerEngagement	171	100,0%	0	0,0%	171	100,0%

Descriptives

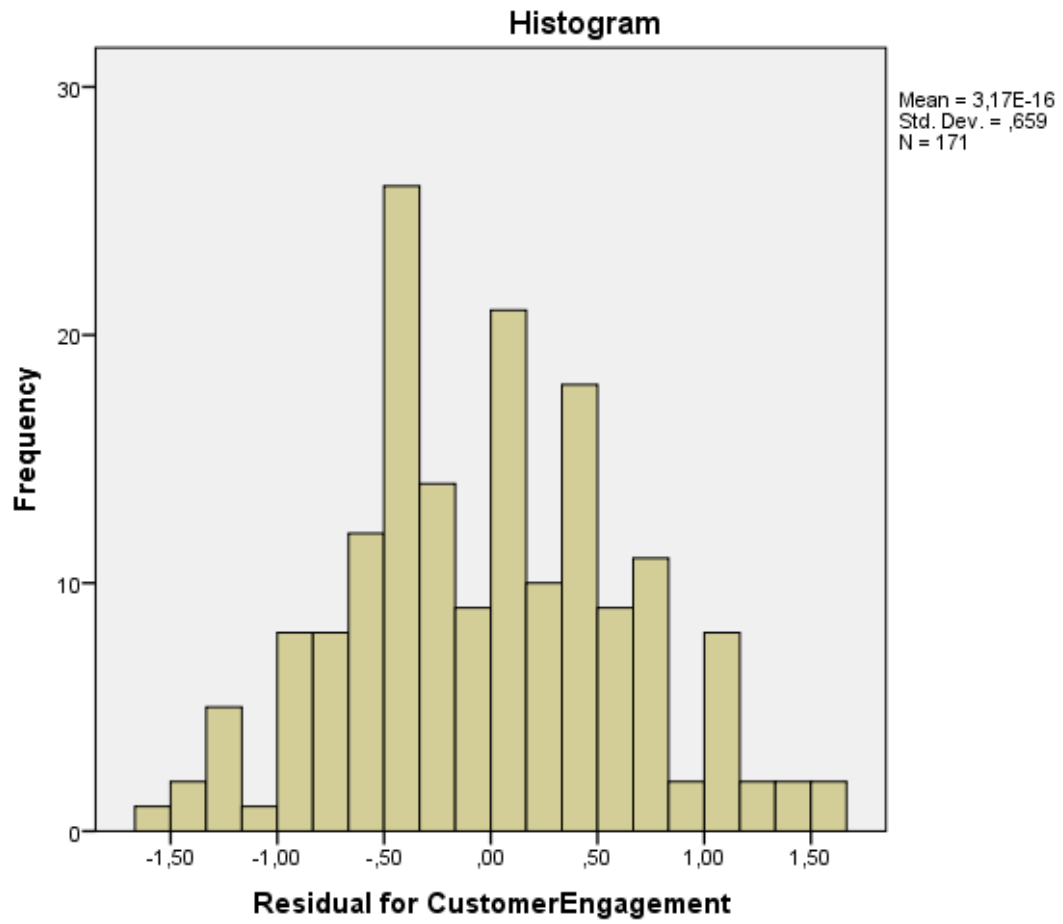
		Statistic	Std. Error
Mean		,0000	,05039
	Lower Bound	-,0995	
	Upper Bound	,0995	
5% Trimmed Mean		-,0031	
Median		-,0179	
Variance		,434	
Std. Deviation		,65888	
Minimum		-1,52	
Maximum		1,65	
Range		3,17	
Interquartile Range		,94	
Skewness		,121	,186
Kurtosis		-,305	,369

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Residual for CustomerEngagement	,069	171	,047	,990	171	,270

a. Lilliefors Significance Correction

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE



Appendix 7: Two-way between subjects ANOVA

Between-Subjects Factors

	N
0	81
1	90
0	90
1	81

Descriptive Statistics

Dependent Variable: CustomerEngagement

Brand_Group	Const_Group	Mean	Std. Deviation	N
	0	1,9345	,62970	42
	1	2,3462	,56666	39
	Total	2,1327	,63133	81
	0	2,4583	,71335	48
	1	3,5179	,72287	42
	Total	2,9528	,88994	90
0		2,2139	,72142	90
1		2,9537	,87599	81
Total		2,5643	,87797	171

Levene's Test of Equality of Error Variances^a

Dependent Variable: CustomerEngagement

F	df1	df2	Sig.
2,074	3	167	,106

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

a. Design: Intercept + Brand_Group + Const_Group + Brand_Group * Const_Group

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Tests of Between-Subjects Effects

Dependent Variable: CustomerEngagement

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	57,242 ^a	3	19,081	43,177	,000	,437
Intercept	1118,073	1	1118,073	2530,053	,000	,938
Brand_Group	30,552	1	30,552	69,136	,000	,293
Const_Group	23,002	1	23,002	52,049	,000	,238
Brand_Group * Const_Group	4,461	1	4,461	10,095	,002	,057
Error	73,800	167	,442			
Total	1255,500	171				
Corrected Total	131,042	170				

a. R Squared = ,437 (Adjusted R Squared = ,427)

1. Grand Mean

Dependent Variable: CustomerEngagement

		95% Confidence Interval	
		Lower Bound	Upper Bound
2,564	,051	2,464	2,665

2. Brand_Group

Dependent Variable: CustomerEngagement

			95% Confidence Interval	
			Lower Bound	Upper Bound
0	2,140	,074	1,994	2,286
1	2,988	,070	2,849	3,127

3. Const_Group

Dependent Variable: CustomerEngagement

			95% Confidence Interval	
			Lower Bound	Upper Bound
0	2,196	,070	2,058	2,335
1	2,932	,074	2,786	3,078

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

4. Brand_Group * Const_Group

Dependent Variable: CustomerEngagement

			95% Confidence Interval	
			Lower Bound	Upper Bound
0	1,935	,103	1,732	2,137
1	2,346	,106	2,136	2,556
0	2,458	,096	2,269	2,648
1	3,518	,103	3,315	3,720

Tukey post hoc procedure:

Multiple Comparisons

Dependent Variable: CustomerEngagement

Tukey HSD

				95% Confidence Interval	
				Lower Bound	Upper Bound
AH_Low	1,0595*	,14046	,000	,6950	1,4240
Aldi_High	1,1717*	,14783	,000	,7881	1,5553
Aldi_Low	1,5833*	,14506	,000	1,2069	1,9598
AH_High	-1,0595*	,14046	,000	-1,4240	-,6950
Aldi_High	,1122	,14331	,862	-,2597	,4841
Aldi_Low	,5238*	,14046	,001	,1593	,8883
AH_High	-1,1717*	,14783	,000	-1,5553	-,7881
AH_Low	-,1122	,14331	,862	-,4841	,2597
Aldi_Low	,4116*	,14783	,030	,0280	,7953
AH_High	-1,5833*	,14506	,000	-1,9598	-1,2069
AH_Low	-,5238*	,14046	,001	-,8883	-,1593
Aldi_High	-,4116*	,14783	,030	-,7953	-,0280

Based on observed means.

The error term is Mean Square(Error) = ,442.

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

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

CustomerEngagement

Tukey HSD

		Subset		
		1	2	3
Aldi_Low	42	1,9345		
Aldi_High	39		2,3462	
AH_Low	48		2,4583	
AH_High	42			3,5179
Sig.		1,000	,864	1,000

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = ,442.

- a. Uses Harmonic Mean Sample Size = 42,511.
- 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 8: Demographic control variables ANCOVA

Control variable gender (covariate):

	N
0	90
1	81
0	81
1	90

Tests of Between-Subjects Effects

Dependent Variable: CustomerEngagement

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	57,683 ^a	4	14,421	32,632	,000	,440
Intercept	693,009	1	693,009	1568,171	,000	,904
Gender_Dummy	,441	1	,441	,998	,319	,006
Const_Group	21,603	1	21,603	48,883	,000	,227
Brand_Group	30,115	1	30,115	68,145	,000	,291
Const_Group * Brand_Group	4,222	1	4,222	9,553	,002	,054
Error	73,359	166	,442			
Total	1255,500	171				
Corrected Total	131,042	170				

a. R Squared = ,440 (Adjusted R Squared = ,427)

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Control variable age (covariate):

Between-Subjects Factors	
	N
0	90
1	81
0	81
1	90

Tests of Between-Subjects Effects

Dependent Variable: CustomerEngagement

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	57,295 ^a	4	14,324	32,242	,000	,437
Intercept	91,925	1	91,925	206,918	,000	,555
Age_Dummy	,053	1	,053	,119	,731	,001
Const_Group	22,870	1	22,870	51,478	,000	,237
Brand_Group	30,388	1	30,388	68,400	,000	,292
Const_Group * Brand_Group	4,404	1	4,404	9,913	,002	,056
Error	73,747	166	,444			
Total	1255,500	171				
Corrected Total	131,042	170				

a. R Squared = ,437 (Adjusted R Squared = ,424)

CO-CREATION OF VALUE FROM A SERVICE CONSTELLATION PERSPECTIVE

Control variable education (covariate):

Between-Subjects Factors	
	N
0	90
1	81
0	81
1	90

Tests of Between-Subjects Effects

Dependent Variable: CustomerEngagement

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	57,246 ^a	4	14,311	32,192	,000	,437
Intercept	386,828	1	386,828	870,138	,000	,840
Education_Dummy	,003	1	,003	,007	,931	,000
Const_Group	22,582	1	22,582	50,795	,000	,234
Brand_Group	30,514	1	30,514	68,639	,000	,293
Const_Group * Brand_Group	4,454	1	4,454	10,020	,002	,057
Error	73,797	166	,445			
Total	1255,500	171				
Corrected Total	131,042	170				

a. R Squared = ,437 (Adjusted R Squared = ,423)