Service Innovation, Customer-Perception & Loyalty: An Experiment

How Does Customer-Perceived Service Innovation Affect Customer Loyalty?

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Preface

This master's thesis is one of a series of papers and reports published by the Centre for Service Innovation (CSI). Centre for Service Innovation (CSI) is a coordinated effort by NHH to focus on the innovation challenges facing the service sector and involves 20 business and academic partners. It aims to increase the quality, efficiency and commercial success of service innovations and to enhance the innovation capabilities of its business and academic partners. CSI is funded through a significant eight-year grant from the Research Council of Norway and has recently obtained status as a Centre for Research-based Innovation (SFI).

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Writing this thesis has been an unpredictable and inspiring journey which also marks the end of our studies at NHH. But we certainly would not have been able to achieve this without support.

Firstly, we would like to express our gratitude to our supervisor Seidali Kurtmollaiev who not only introduced us to the exciting field of service innovation, but always provided us with his valuable guidance and expertise. We highly appreciate his flexibility and the availability of his feedback throughout the supervision of this thesis.

Furthermore, we would like to thank everyone that took the time to participate in our experiment and made this study possible.

Lastly, we want to thank our friends and families for their support throughout our studies.

Executive Summary

Over the past years, due to an ever-accelerating progress of innovation, service innovation has become a highly relevant research topic. Nonetheless, most research focuses on innovation from a firm perspective. Consequently, the customer's point of view, which is crucial for a service innovation to succeed, is neglected and there is little knowledge about how customers perceive service innovation and the subsequent effects on loyalty.

Therefore, this thesis has the objective to enhance the understanding of customer perception of servicescape and customer relations innovations specifically, their effects on emotional and cognitive satisfaction and ultimately on customer loyalty.

After establishing the theoretical model with the prescribed relationships, an experiment via an online survey was conducted to investigate the causal relationships. Whereas the control group received a case without any manipulation, the three treatment groups received texts describing a servicescape innovation, a customer relations innovation or a mix of both.

After analysing all responses (N=124) by applying structural equation modeling, no general significant relationship between firm innovation and customer loyalty was found, as only 5 of our 19 hypotheses were supported by the data. Only the mix of both innovation types led to significant perceived changes in servicescape and customer relations. These perceived changes, however, only have significant effects on emotional, but not cognitive satisfaction. Moreover, we confirm findings that both emotional and cognitive satisfaction have significant effects on customer loyalty.

Conclusively, this thesis has been a further step in the process of understanding the customer's perception of service innovation and provides several directions for further research in the field.

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1 Introduction

1.1 Topic and Research Question

In the last decades, consumers were confronted with an ever-accelerating progress due to innovation. Through globalisation and the development of new technologies, particularly information and communication technologies, new opportunities and business models have emerged for companies. Moore's Law (1965) and Kurzweil's (2001) prediction of an exponential development of technology in the Law of Accelerating Returns described this past progress early on. Consumers have witnessed continuously growing possibilities of technology in form of innovations across all industries. Moreover, this trend can also be observed on the companies' side. Firms are investing increasing amounts of resources into research and development (R&D) to foster innovation (Strategy&, 2017), which again is considered a valuable source of sustainable competitive advantages (Jian & Wang, 2013).

The term innovation itself can be seen as a large concept, covering firm-internal areas such as process innovations, as well as product and service innovations that are directly visible to the customer. According to Terziovski (2007), innovation is "the application of resources to create value for the customer and the enterprise by developing, improving and commercializing new and existing products, processes and services" (p. 3). Similarly, but more concise, Anthony (2012) describes the term as "something different that has impact". Generally, novelty and the creation of value can be seen as the main characteristics of the term innovation.

Given that the world's top advanced economies now derive most of their GDP not from products, but from services (Wölfl, 2005), the concept service innovation is growing in importance. According to Lusch and Nambisan (2015), service innovation is defined as "the rebundling of diverse resources that create novel resources that are beneficial […] to some actors in a given context" (p. 161), emphasizing the value that is experienced by the beneficiary rather than just the output delivered. This view of service innovation underlines the importance of the consumer and the value that she experiences.

This relevance of the customers' perspective in innovation development processes has also been stressed by multiple researchers recently (e.g. Andreassen et al., 2016; Christensen, Hall, Dillon & Duncan, 2016). In practice, we can see many companies adapting and constantly bringing

service innovations to the market, presenting solutions to customers' problems and focusing on customer experience.

Amazon can be taken as such a positive example. The firm introduced its first pay-as-you-go brick-and-mortar store "Amazon Go" in Seattle in early 2017. Customers do not have to queue and wait at the checkout anymore, but can simply leave the store and will be charged automatically via the Amazon go app (Amazon, 2017). Customers' previous problem of having to wait at the checkout, has been solved by offering a new innovative service.

Another prominent and recent case of a fundamental and disruptive innovation is the success story of the online streaming platform Netflix. By offering hundreds of movies and series on demand at a monthly subscription fee, Netflix was able to put Blockbuster, a video rental giant which was valued at $5 billion in 2002, off the market. Thereby, Netflix offered an innovative service which was superior in terms of price, quality and convenience (Downes & Nunes, 2013).

The banking industry is a further example. Banks as well have made use of new technologies and brought multiple innovations to the market in recent years. Many of them, e.g. mobile banking accounts, have found wide adoption by the user base (DCCA, 2016).

But there are not only positive examples. Developments of firms such as Kodak or BlackBerry, from being the industry's respective incumbent to becoming a firm that is being overtaken by its adapting and highly innovative competitors, have shown what happens to firms that fail to innovate (Gustin, 2013; Viki, 2017). Firms that offer greater value to the customer are emerging and we can see that continuous adaptation is inevitable for companies that want to succeed in the long term. Freeman and Soete (1997) get to the heart of the issue by declaring that "not to innovate is to die" (p. 266).

We can conclude that continuous improvements are expected by many customers nowadays. Though simply investing heavily in R&D and regularly bringing innovations to the market is not enough for companies to succeed, since the perception and acceptance of an innovation through the customers are also decisive factors of success. Many companies still face high rates of innovation failures, despite large efforts to adopt consumer-oriented innovation development processes (Kleijnen, Lee & Wetzels, 2009).

Ultimately, firms aim for having loyal customers, in order to have sustained success (Dick & Basu, 1994). Therefore, it is important to bring innovations to the market which increase and sustain customer loyalty.

However, while there have been multiple studies researching and building the link between satisfaction and customer loyalty (Bearden & Teel, 1983; Cronin, Brady & Hult, 2000), the questions of how and in which way an innovation affects customer loyalty, has not been examined in detail. Therefore, we aim to further investigate the impact of service innovations on customer loyalty and the mediating factors in this relationship. By taking a customer perspective, we strive to get deeper knowledge about the link between the customer's perception of a firm's service innovation and the subsequent effects on loyalty on a more precise and differentiated level. This will be achieved by studying how customers perceive service innovations and how this affects cognitive and emotional satisfaction as a mediator for customer loyalty.

More specifically, we set the focus on two service innovation perception dimensions, namely customer relations and servicescape. Innovations in these two fields concern firms' new ways of interacting and building relationships with the group acquiring the service and the physical and digital service environments. This leads us to the following proposed research question for the present study.

> *Do innovations in a firm's servicescape and customer relations affect the customer loyalty mediated by the customer's emotional and cognitive satisfaction, and if so, how?*

1.2 Theoretical and Managerial Contributions

1.2.1 Theoretical Contributions

The field of research on service innovation is vast and challenged by ambiguity. Whereas much research has focused on innovation from the firm's point of view, it is argued that the customer-centric view has been neglected (Kunz, Schmitt & Meyer, 2011). By taking such a customer-centric approach and focusing on the customers' experience, we strive to fill a prevalent gap in research and literature concerning the customers' perception of innovation. To our knowledge, little research has put a focus on how customers process their perception of innovations and how this is linked to loyalty specifically. Whereas service literature on the link between

satisfaction and loyalty is rather broad, literature on the link between satisfaction, influenced by innovated services, and loyalty is not as researched yet.

Additionally, our objective is to contribute to a call for attention to the factor of emotions within service research, since the focus has been mainly on the cognitive processing of satisfaction (Fournier & Mick, 1999).

We have seen a considerable expansion from the physical sphere to the digital one as part of servicescape innovation in recent years. Moreover, due to increasing competition, firms seek novel ways to establish and maintain bonds with their customers. As of today, there have been only few theoretical investigations on these innovation directions from a customer point of view. With this thesis, we also address this shortcoming.

1.2.2 Managerial Contributions

It has been argued before that innovation capabilities can significantly enhance firm performance and may even lead to a competitive advantage.

By conducting an experiment, we strive to give managers first-hand insights on service innovation experience of customers. This provides various learning opportunities and guidance on further innovation decisions in accordance with the demand of Roest and Pieters (1997), who argue that "effective management of assessments and judgements on constructs like service quality, value, satisfaction and attitude requires a clear understanding of what the construct means to the customer" (p. 344).

Moreover, we follow the demand for a higher focus on experience (Christensen et al., 2016). By providing an insight on how customers process experience, practitioners gain valuable insights on how to enhance their services and brands. This will also promote the closure of the disconnection between theoretical advances and managerial usefulness (Brodie & Gustafsson, 2016).

Finally, we object to shed light on the prevalent gap between the management's perception of service in contrast to the customer's perception (Zeithaml, Berry & Parasuraman, 1988) by fully understanding the customer's point of view.

1.3 Thesis Outline

To answer our research question, we first clarify the key concepts concerning customer satisfaction, customer loyalty and service innovation perception. This leads us to our proposed research model and subsequently to the hypotheses. To investigate the hypotheses, we conduct an experiment, as this type of data collection is especially suitable to investigate causal relationships between variables (Saunders, Lewis & Thornhill, 2016). By conducting the experiment, analysing the data and testing our hypotheses, we seek to close the prevailing gap in research concerning service innovation from a customer perspective and to deepen the knowledge on the general link between customers' perception regarding the introduction of novelties and service innovation. By being able to get a sound understanding of the mechanism that innovation triggers in customers' perception, firms will be enabled to place innovations more effectively. All in all, we strive to contribute to the understanding of customer behaviour in innovation research.

2 Theoretical Perspectives & Model

This chapter has the objective to provide a detailed overview of the conceptual background and to develop a theoretical model. After elaborating on the role of customer satisfaction and customer loyalty for firms, service innovation will be discussed as a mean to achieve these goals.

2.1 Customer Satisfaction

Customer satisfaction is a parameter revealing to what extent a product or service of a company has been able to satisfy or please the customer (Nemati, Khan & Iftikhar, 2010). It entails the customer's fulfilment response, thereby judging whether a service or product provides a pleasurable and fulfilling consumption experience (Oliver, 1996).

While services are shaped by a considerably higher degree of interaction compared to products, this definition emphasizes the importance of satisfaction, since the evaluation process of a service covers the whole consumption experience (Bateson & Hofmann, 1999; Bitner, 1990).

Customer satisfaction is receiving growing attention in research and management practise and has been established as one of the main goals for most service firms today (Jones & Sasser, 1995). Therefore, it is considered as the key to the success of a company and its competitiveness in the long run (Hennig-Thurau & Klee, 1997). High levels of customer satisfaction trigger further beneficial effects for companies such as positive word-of mouth (e.g. Oliver, 1980; Reichheld & Sasser, 1990) and good references (Crosby, Evans & Cowles, 1990). By satisfying customers today, firms can trigger a positive impact on their future profitability (Anderson & Sullivan, 1993).

Research widely distinguishes between two types of satisfaction, namely cognitive and emotional (or affective) satisfaction. Whereas cognitive satisfaction relates to the customer's thoughts, emotional satisfaction concerns the customer's feelings towards the service encounter.

2.1.1 Cognitive Satisfaction

Research conceptualizes the term cognitive satisfaction as the discrepancies between prior expectations and actual performance. Thereby, positive (negative) disconfirmation leads to satisfaction (dissatisfaction) (Anderson & Sullivan, 1993; Tse & Wilton, 1988; Westbrook & Oliver, 1991).

In order to portray the cognitive processes in which consumers are engaged in, Oliver (1980) formulated the expectancy-disconfirmation framework. Before making any purchase, the consumer has pre-consumption expectations. In the next step, through the observation and perception of a service performance, the consumer conducts a comparison with her expectations. Satisfaction arises from the combination of this information with the previous expectation levels. In case of a positive disconfirmation, meaning that the performance exceeds the expectations, satisfaction increases. In case of a negative disconfirmation, meaning that the performance falls short of the expectations, satisfaction decreases. In other words, the initial expectations act as an anchor that directly influences the resulting judgement of satisfaction (Oliver, 1999). All in all, it is "the cognitive comparison between the adaption level and the actual product experience (disconfirmation) [which] determines the manner in which subsequent evaluation will deviate from the adaptation level" (Oliver, 1980, p. 466.). Furthermore, it is argued that future purchases are influenced by satisfaction experiences (Howard, 1974).

Moreover, the cognitive sphere also entails the judgment of perceived service quality which arguably is a key factor for the success of a service innovation and applied in various service satisfaction conceptualisations (Liljander & Strandvik, 1994).

According to Lervik-Olsen, Kurtmollaiev & Andreassen (2016), it is the cognitive processes which serve for the primary evaluation of a change or improvement and service by a customer. As a reaction to the cognitive responses, the customer engages in emotional satisfaction processing.

2.1.2 Affective Satisfaction

Until recently, research has focused on the cognitive processing of satisfaction (Fournier & Mick, 1999). Nonetheless, the discussion of the role of emotions (or affect) in customer satisfaction is gaining increasing attention. According to Cohen and Areni (1991), affect is the general description of a valanced feeling state.

As demonstrated by Westbrook (1987), consumers form two general affect states, whereas one is based on positive emotions, such as joy and interest, and the other on negative emotions, such as anger, disgust, and contempt. The emotional component of satisfaction is further supported by Batra and Holbrook (1990), Havlena and Holbrook (1986), and Westbrook and Oliver (1991). Regarding the possible dimensions of customer feelings, Russell (1980) proposed

pleasure and misery as well as arousal and sleepiness as four independent dimensions of affect which are presented in the circumplex model of affect, with excitement, contentment, depression and distress as further outcomes.

Figure 1: The Circumplex Model of Affect after Russell (1980)
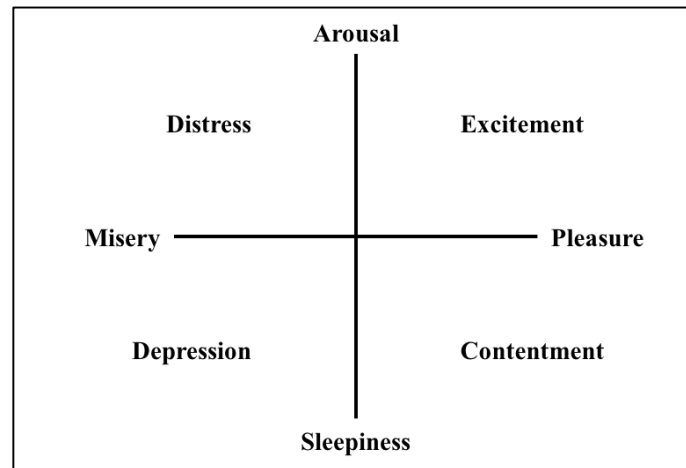
Whereas some scholars consider affect as a mere mediator between cognitive satisfaction and general customer satisfaction (e.g. Oliver, 1993), it is also argued that affect serves as an independent contributor to customer satisfaction (Cronin et al., 2000; Liljander & Strandvik, 1997). Furthermore, it is contended by Allen, Machleit and Schultz Kleine (1992) as well as Dube-Rioux (1990) that emotions can be superior predictors of behaviour than cognitive evaluations. Nonetheless, most emotional satisfaction concepts deal with service encounters in general, whereas the context of service innovation is not as researched yet.

Conclusively, this leads us to a definition of satisfaction that comprises of separate entities of cognitive and affective customer satisfaction. Hence, cognitive and emotional satisfaction will be treated as two independent factors in this study, which allows to explore the relationship between cognitive and affective satisfaction further.

2.2 Customer Loyalty

Customer loyalty can be defined as a favourable attitude towards a brand entailing repeated purchase (Day, 1969), a relationship between a positive attitude towards an entity with repeated buying (Dick & Basu, 1994), as well as a situation of repeated patronage that is accompanied by a psychological bond (Jarvis & Wilcox, 1977).

Past research has identified a strong relationship between customer satisfaction and a customer's future intentions (Bearden & Teel, 1983; Oliver, 1980; Oliver, 1999). Cronin et al. (2000) have confirmed that satisfied customers are more likely to remain loyal, conduct repurchases and make recommendations to peers. Moreover, Bearden and Teel (1983) contend that satisfaction is a significant determinant of repeated sales and positive word of mouth. In other words, satisfaction, based on an experience, leads to customer loyalty. This view is also supported by Dick and Basu (1994), Mittal and Kamakura (2001) and Selnes (1993). Additionally, LaBarbera and Mazursky (1983) have demonstrated that the higher the level of satisfaction, the lower the probability of customers to switch to another brand. Thus, customer satisfaction is to be considered as a crucial antecedent for loyalty, as satisfied customers are highly likely to become loyal customers.

Interestingly, with regards to online services, it is found that the same level of customer satisfaction for an online and offline service results in higher loyalty for the service provider, if the service is chosen online. Therefore, the relationship between customer satisfaction and loyalty is even stronger for online services (Shankar, Smith & Rangaswamy, 2003).

Nonetheless, while satisfied customers continue to do business with the company, they are loyal and to some degree avoid doing business with competitors (Jacoby & Chestnut, 1978), it is important to mention that being loyal to a company does not necessarily mean that a customer is satisfied (Oliver, 1999). This could be due to the unavailability of substitute products or services or a lack of financial resources, which make it impossible to afford other suitable, but more expensive, substitutes among other reasons.

Notably, loyal customers are found to be a valuable source for service improvements (Wikström, 1996). With the notion of considering innovations as improvements, this generates a reciprocal relationship between innovation and loyalty: by applying innovation to enhance loyalty, the loyal customers can deliver decisive inputs for service innovations.

2.3   Customer Perception of Service Innovation

But how can firms achieve customer satisfaction and loyalty? To grow and sustain a satisfied and loyal customer base, service providers can improve and adapt their service offering and create more distinctive and fulfilling service experiences. Hence, firms engage in service innovation in order to perfectly meet and exceed customers' needs. The following will provide

an overview of the concepts of service and service innovation and finally discuss how firms can apply service innovation to create customer loyalty.

2.3.1 Definitions and Characteristics of Service

Services have become a crucial part of everyday life and it has become almost impossible to spend a day without using a service. Generally, economies have been transformed by a growing service sector over the past century. As Hipp and Grupp (2005) argue, it is an increasing number of service companies that drive economic growth, whereas the importance of goods has been declining.

But what exactly does the term "service" entail? Research has provided numerous definitions and concepts which strive to answer this question. Keeping the concept very broad, Vargo and Lusch (2004) define service as "the application of competences (knowledge and skills) through deeds, processes and performances for the benefit of another entity or the entity itself" (p. 2). More specifically, Gadrey, Gallouj and Weinstein (1995) propose:

> "to produce a service (...) is to organize a solution to a problem (a treatment, an operation) which does not principally involve supplying a good. It is to place a bundle of capabilities and competences (human, technological, organisational) at the disposal of a client and to organise a solution, which may be given to varying degrees of precision." (pp. 2)

Both of these definitions suggest that services compromise of intangible solutions to customers' problems. Services significantly differ from products in various aspects. Firstly, as aforementioned, services are intangible, in other words they are not physical. Secondly, a service is characterized by simultaneous production and consumption. Taking the example of a haircut into account, the hairdresser produces the haircut, while the customer simultaneously consumes the service. Thirdly, service consumption is considered a process (Grönroos, 2000a). Services require a rethinking of value creation systems. In contrast to a product-centred view, which argues in favour of understanding value as a unit of firm output, services involve a view on value which focuses on processes which integrate resources (Vargo, Maglio & Archpru Akaka, 2008).

Building on the presented definitions and prevalent characteristics of service, we define "service" as the following for this study:

"a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems." (Grönroos, 2000b, p. 46).

2.3.2 Service Innovation

2.3.2.1 An Introduction to Innovation

Over the past years, the business environment has been particularly challenged by advancing technology, increasing digitalisation and globalisation. As a result, trade is more transparent and open, allowing customers to choose from a bigger range of options and diversified customer needs have evolved. Markets have become increasingly differentiated, resulting in a much wider variety of products and especially services offered, which aim to capture value by addressing the diversified needs (Teece, 2010). In order to provide remarkable and satisfying experiences to consumers, which are crucial to compete and foster loyalty, firms spend significant resources to expand and improve products and services, resulting in various forms of innovations. Consequently, the concept of innovation has been established as a significant buzzword for today's business arena.

The term innovation is not only highly relevant today. The concept has already been established by Joseph Schumpeter who defines innovation as the process of setting up a new production function (Schumpeter, 1939). Moreover, Schumpeter provides five specific innovation types: the introduction of a new good, the introduction of a new method of production, the opening of a new market, new sources of supply of new materials, and establishing a new organization of any industry. This conceptualisation perfectly illustrates the wide scope of the term innovation (Schumpeter, 1936). Schumpeter established further crucial innovation concepts, namely radical and incremental innovations. While a radical innovation yields a new product or service which bears market-disrupting features, incremental innovations in contrast, concern the improvement of existing services and products (Cooper, Edgett & Kleinschmidt, 1999).

2.3.2.2 Defining Service Innovation

Whereas product innovation has been a main point of discussion in the past, research has moved on to a focus on service innovation. Generally, there is a vast number of definitions of service innovation, depending on the chosen perspective. Scholars warn that several approaches to

innovation have the tendency to focus on innovations in terms of technology. This is considered a limitation when it comes to the discussion of service innovation, since a mere technology-approach creates a bias (den Hertog, van der Aa & de Jong, 2010). It is crucial to avoid biases towards certain innovation types as these result in disregarding other essential components and areas of service innovation.

According to Enz (2012), service innovation is

> "the introduction of novel ideas that focus on services that provides new ways of delivering a benefit, new service concepts, or new service business models through continuous operational improvement, technology, investment in employee performance, or management of the customer experience" (p. 187).

Emphasising added value, it can also be defined as

> "a new service or such a renewal of an existing service which is put into practice and which provides benefit to the organization that has developed it; the benefit usually derives from the added value that the renewal provides the customers. In addition, to be an innovation the renewal must be new not only to its developer, but in a broader context, and it must involve some element that can be repeated in new situations, i.e. it must show some generalizable feature(s). A service innovation process is the process through which the renewals described are achieved" (Toivonen & Tuominen, 2009, p. 893).

However, these are just few of the total number of existing definitions. Due to the vastness and complexity of existing concepts and its ambiguity, the term service innovation has been subject to reviews (Witell, Snyer, Gustafsson, Fombelle & Kristensson, 2016). The authors find that there are three perspectives from which service innovation can be defined. Firstly, there is the assimilation perspective which is based on the term "innovation" and refers to concepts from product innovation which are transferred to services. Secondly, the demarcation perspective focuses rather on the uniqueness of service innovation comparing to other types of offerings, such as products. Thirdly, definitions may be based on a synthesis perspective, meaning that the service dimension can help to understand general innovation (Witell et al., 2016).

In this thesis we apply a broader innovation definition, since a service innovation does not require the introduction of a new service per se. We follow den Hertog's et al. (2010) approach which states that:

"A service innovation is a new service experience or service solution that consists of one or several of the following dimensions: new service concept, new customer interaction, new value system/business partners, new revenue model, new organizational or technological service delivery system." (p. 494)

2.3.2.3 Characteristics and Implications of Service Innovation

A major reason for service innovation is the general business environment as companies are challenged by fierce competition. At the same time, consumer preferences, values and consumption patterns have substantially diversified and firms are eager to meet all these preferences (Chen, Tsou & Huang, 2009).

In order to reach this objective, firms can innovate via three different levels: on a sector, agent, or activity level (Rubalcaba, Michel, Sundbo, Brown & Reynoso, 2012). Generally, firms are required to engage in service innovation activities to create and sustain opportunities for competitive advantages. It is argued that it is wide mainstream in current literature to assume that there are similar drivers behind product and service innovation (Ordanini & Parasuraman, 2011). However, as has been discussed, services and physical products bear significant differences. A service has very different characteristics which concern the specifics of service innovation, namely intangibility, co-production with customers, simultaneity, heterogeneity and perishability (Fitzsimmons & Fitzsimmons, 2000).

Notably, especially for interactive services, customers also experience the actual providers, the service delivery staff, as part of their customer experience and consequently of the innovation (Berry, Shankar, Turner Parish, Cadwallader & Dotzel, 2006). Moreover, various services require the immediate participation of the customer, resulting in customer intensity. Services can also be self-services, not involving a service employee facilitating the provision of the service (Miles, 2008). All these factors have to be taken into account for service innovation.

Evidently, firms have grasped the need to provide excellent services and consequently recognize a mandatory focus on services. Developing these innovation capabilities can be very challenging, as the development of radical service innovations requires more intense R&D

strength than their product counterparts, with which companies may be more familiar (Nijssen, Hillebrand, Vermeulen & Kemp, 2006). Moreover, the provision of novel services requires different dynamic capabilities than product provision, which have been defined in the Six-dimension Capability Framework (Den Hertog et al., 2010). The authors argue that firms need new service concepts, new customer interaction, new business partners, new revenue models, a new delivery system in terms of personnel organization, and new delivery systems in terms of technology in order to realise novel service experiences and solutions. These capabilities are also a key driver of consistent high performance (Alam, Arumugam, Mohd Nor, Kaliappan, & Fang, 2013).

Whereas in earlier years competitive efforts of differentiators were centred around quality, functionality, price and brand, firms are now competing mainly on service, information and delivery (Mascarenhas, Kesavan & Bernacchi, 2006; Shaw & Ivens, 2002). Moreover, service innovation has gained significant importance for manufacturers, too, namely as a mean to differentiate by diversifying their offers (Kindström, Kowalkowski & Sandberg, 2013). Often, products and services are bundled in order to provide a value-added service chain and hence enhance their competitive advantage (Chen, Wang, Huang & Shen, 2016).

Evidently, the concept service innovation holds a certain ambiguity. Therefore, it is important to ask the question of the relevant dimensions in which service innovation can come into existence. To answer this, den Hertog (2000) formulated the "four-dimensions of service innovation novelty concept", describing four service areas which can be innovated. Firstly, novelty can occur in the service concept, which involves addressing a new market, proposing new value and finding solutions to new or existing issues. Secondly, service providers can innovate the client interface which entails the way the client is involved in the service. Thirdly, firms can innovate the way the job-to-be-done is delivered to the customer. Finally, innovation can concern the technology involved in the service provision, which is especially crucial in the areas of service process and service delivery innovation. Depending on the respective industry of the firm, the importance of technology can be higher or lower.

2.3.2.4   The Emergence of E-Services

Services are increasingly expanding from physical to digital realms, with technology playing a significant role in a wide number of sectors and industries (Barrett, Davidson, Prabhu & Vargo, 2015). In order to describe services incorporated in cyberspace, the term e-service has been

established (Rust & Lemon, 2001). Due to the growing importance of the internet, the concept will likely remain as a key concept in service innovation research. Firms can benefit considerably from the adoption of e-services. It does not only extend available options for customers, but can also improve the relationship between a customer and the company (Alsop, 1999). Moreover, they are an opportunity to save cost and enable differentiation and segmentation (de Ruyter, Wetzels & Kleijnen, 2000). According to van Riel, Liljander and Jurriens (2001), there are five components of e-service, namely core service, facilitating services, supporting services, complementary services and the user interface which enables the access for the customer. Moreover, de Ruyter et al. (2000) find that a strong organizational reputation facilitates the adoption of e-services. By employing e-services, firms have the chance to significantly improve consumer values via enhancing the buying experience, enable customer control and facilitate personalization of services (Rust & Lemon, 2001). Due to the interdependence of e-services and seemingly unlimited opportunities with regards to technology, e-services are considered as highly relevant in the context of service innovation.

2.3.3   How Customers Experience Service Innovation

As argued above, there is wide consensus that service consumption differs to product consumption due to different characteristic components. Services also differ in the way consumers experience them, compared to a product. The call for a customer-centric approach in service innovation emphasizes the consideration of the customer perspective and experience. Therefore, it is crucial to take the customer's experience into account (Verhoef et al., 2009). This chapter will introduce key concepts in the realms of service experience in general before moving to service innovation experience in particular.

In contrast to product innovation, service innovation is shaped by the sensing of customers' needs (Edvardsson & Olsson, 1996). This notion introduces a crucial aspect: service innovation has a significant connection to the customer, especially as a means to strengthen customer satisfaction and loyalty. Consequently, firms have to consider this, while implementing new processes and resources. It follows that the customer and her service experience play a central role in the realm of service innovation.

Experience is a crucial element of the consumption process. Since the work of Holbrook and Hirschmann (1982), experience has been an essential part of the research around consumer behaviour by adding it as a factor to the information processing model (Bettmann, 1979).

Taking the experience of services into account, it is argued that the experience itself is the key factor for the success of a service, in contrast to physical products which offer more visible attributes (Padgett & Allen, 1997). Services again depend on various processes, people and facilities (Grace & O'Cass, 2004), making the matter highly complex, as all of these components are part of the overall experience.

According to the three-stage-model (Tsiotsou & Wirtz, 2015), consumers of services go through a pre-purchase stage, the service encounter stage and finally, the post-encounter stage. Figure 2 illustrates the consumer's service journey and quotes the relevant processes. Customer satisfaction plays a significant role in the post-consumption stage during which the consumer evaluates the service performance and develops future intentions (Tsiotsou & Wirtz, 2015).

Figure 2: Consumer's Service Journey after Tsiotsou & Wirtz (2015)

Pre-Purchase Stage	**Service Encounter Stage**	**Post-Service Stage**
• Need awareness • Information search • Evaluation of alternatives • Make decision on service purchases	• Request service from chosen supplier or initiation of self-service • Service delivery interaction	• Evaluation of service performance • Future intentions
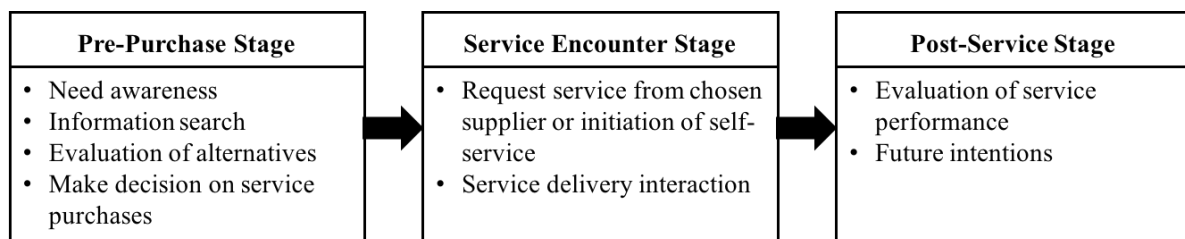
To shift a focus on the different stages of experience during a service encounter, Arnould, Price and Zinkhan (2004) propose a four-stage model of service experience. According to the model, consumers encounter pre-consumption experience, purchase experience, core consumption experience and the remembered consumption experience. On each experience stage, consumers receive clues which are sorted into a set of expressions. These clues either origin from the performance or the context. Depending on whether the clues are well organized and set, consumer preference may be crafted (Carbone & Haeckel, 1994).

2.3.4 Experience and Perception of Service Innovation

Clearly, a positive experience for the customer is a key determinant for the successful provision of services. Therefore, several researchers have urged to not only promote a more consumer-but also experience-centric perspective on service design (Zomerdijk & Voss, 2010). Notably, experience is one of the paths that influence customer preference, besides service performance (Carbone & Haeckel, 1994). Consequently, perception and subsequently experience are crucial factors for service innovation, as service innovators can proactively shape the experience design of the respective innovation.

It has been widely recognized that despite substantial and resource-intensive innovation activities, many innovations fail within the first three years (Kunz et al., 2011). One reason which has been identified for this crucial shortcoming is the negligence of the customer perspective. Hence, it has been argued that the inclusion of the perception of an innovation from the customer's point of view is crucial (Kunz et al., 2011). Moreover, we observe that the consumer perception of an innovation serves as a better predictor of innovation adoption than socio-demographic variables such as income and age which have been mostly taken into account in the past (Jansson, Marell & Nordlund, 2011).

Therefore, understanding how customers perceive innovation is essential. One important aspect is the winning of awareness towards the innovation. The more often individuals experience an innovation by vision, hearing or inner recognition, the more likely it is that the innovation is stored in the individual's memory (Keller, 2007).

Perception is a function of several input sources from both the environment and the individual's predisposition, expectations, motives and knowledge earned from past experiences (Schiffman, 2001). Early research by Ostlund (1974) demonstrates that "the perceptions of innovations by potential adopters can be very effective predictors of innovativeness, more than personal characteristic variables" (p. 28). It is also remarkable experiences, both direct and indirect ones, which firms constantly need to deliver to customers in order to be perceived as innovative (Brown & Dacin, 1997).

But what exactly does it take for a firm to be perceived as innovative? Scholars agree that a firm has to be able to deliver observable, novel and creative solutions on a regular basis with a significant market impact at a fast and consistent rate over time (e.g. Im & Workman, 2004; Roehrich, 2004). Moreover, findings suggest that firms are not aware to what extent an innovation impacts customers' perception of value (Flint, 2006). Nonetheless, it is evident that reputation plays a significant role, especially within service markets. This is linked to the rather vague and partial pre-purchase evolution of the service (Weigelt & Camerer, 1988), as the pre-purchase assessment of a service is rather difficult.

With regard to these aspects, we aim at expanding this approach by examining the effects of perceived innovation. As a large number of concepts and definitions around service innovation is prevalent, it is necessary to establish a framework which allows to identify dimensions of innovation perception for users of a service.

Perception serves as a key component when it comes to assessing the response of consumers to innovation (Hauser & Urban, 1977). In order to model and grasp the realm of service innovation perception by customers, we apply the four dimension-model of service innovation proposed by Lervik-Olsen et al. (2016). The model has been identified by a thorough literature review and interviews conducted with customers. As argued above, the literature demands a more customer-based perspective on innovation. This approach strives to support the ongoing discussion around the enhancement of improved prediction of innovation outcomes (Chen et al., 2009). The following paragraphs will discuss the innovation perception dimensions in detail.

2.3.4.1 Core Service Innovation

Firstly, innovation can be perceived within the core service. According to Christensen, Anthony, Berstell and Nitterhouse (2007), this concept can be referred to as a "job-to-be-done" by the customer. This concept indicates that a product or service shall not be considered by its customer or product characteristics to determine customer behaviour. Rather, the job itself is the fundamental problem a customer needs to resolve in a certain situation and for which she hires a solution. (Christensen et al., 2007). Consequently, the core service addresses the issue of the job-to-be-done. Successful core service innovations both address newly established problems and find improved and different ways to solve already addressed problems.

2.3.4.2 Service Delivery Innovation

Secondly, there is the aspect of service delivery innovation. Service delivery addresses the operations that transform inputs into outputs (Johnston & Clark, 2001). Innovation in this area refers to the delivery of services in novel ways to perfectly meet all customer segments and needs, as well as to ensure optimal performance. This can be accomplished by creating novel service channels or improving existing ones for both new and existing customers (Chen et al., 2009). Ultimately, service delivery innovations aim at ensuring flexibility, simplicity and efficiency. Remarkably, the growing omnipresence of the internet in the context of services, has considerably influenced the role of the consumer. Instead of only receiving or having a service delivered, the consumer plays a more active role resulting in a high degree of co-creation in the service production process (Xue & Harker, 2002).

2.3.4.3 Customer Relations Innovation

Thirdly, customers can perceive and experience innovation in service customer relations enforcing the interaction of the company with the party acquiring the service.

Firms are eager to establish relationships with their customers to maintain a stable customer base. Different approaches to do so are prevalent and they broadly concern the communication between the firm and the customer. Relationship marketing and management supports the notion that marketing should not only attract customers, but that its objective also contains the solidification of relationships and the transformation of indifferent customers to loyal ones (Berry, 1995). Berry (1995) also emphasizes that the relationship marketing in services, which will be denoted as customer relations in the following, offers benefits to both the firm and customers. It does not only improve firm performance (Reichheld & Sasser, 1990), but also strengthens the customer's position. Due to its intangible nature, a potential service consumption is associated with risks for the consumer, since the pre-evaluation of a service is a difficult task. A strong relationship between a firm and the customer leads to risk-reduction, as the pre-service evaluation is facilitated.

Additionally, customer relations support the customer's call for more personalised and closer relationships with service providers (Parasuraman, Berry & Zeithaml, 1991). This finding contributes to the conception of service and customer co-creation, since customer collaboration, which is significantly facilitated by customer relations innovation, also bears a positive effect on innovation volume (Ordinani & Parasuraman, 2011).

Furthermore, advancing technology has opened up numerous possibilities to enhance efficiency and effectiveness of customer relations innovations. It allows to track buying patterns, to offer customized and personalized services, promotions and pricing, to integrate multiple services to the customers, to provide two-way communication channels, to minimize probability of service errors and to augment existing core services (Berry, 1995). Customer relations innovations have the objective to strengthen these conditions. In case of a high-quality relationship, customer retention is likely to be positively influenced (Hennig-Thurau & Klee, 1997).

2.3.4.4 Servicescape Innovation

Fourthly and finally, customers perceive innovations within the firm's servicescape. According to Bitner (1992), this term entails the physical environment in which a service process is

experienced. Notably, as a result of the growing role of digitalisation, a big range of services is connected to web solutions and therefore lacks a physical environment. However, this virtual environment can still be accounted for a possible area for innovations (Lervik-Olsen et al., 2016; Nilsson & Ballantyne, 2014). The authors criticize the neglect of this aspect due to the fact that digital servicescapes, such as online shops or smartphone applications for instance, are increasingly spreading out and argue for a definition of servicescape that comprises of the physical and the digital environment. Many firms innovate by establishing online servicescapes and vice versa, online-based firms innovate by establishing brick-and-mortar branches.

The servicescape is a decisive contributor to consumption experiences. Bitner (1992) argues that "the service setting can affect consumers' emotional, cognitive, and physiological responses, which in turn influence their evaluations and behaviours" (p. 6). Lovelock and Wirtz (2011) identify four main purposes of servicescapes: the engineering of consumer experience and shaping of consumer behaviours, transmission of the planned image of the firm and support its positioning and differentiation strategy, being part of the value proposition, and finally the facilitation of service encounter and enhancement of both service quality and productivity.

Research has illustrated that the physical environment can have a significant impact on customer satisfaction and service perception (Hutton & Richardson, 1995; Wakefield & Blodgett, 1996). Possible innovations can be changes in the layout or style of a digital presence or in the appearance of a brick-and-mortar store. Changes in terms of both tangible and intangible/digital servicescapes also have an impact on the evaluated service quality (Reimer & Kuehn, 2005). The digital servicescape is also referred to as e-scape in the literature. Depending on whether the e-scape is appealing and easy to navigate or not, it has an impact on the level of satisfaction with a service (Van Riel, Lemmink & Streukens, 2004)

Conclusively, we argue that these outlined innovation perception dimensions, namely core service, service delivery, customer relations and servicescape, influence the consumer experience and thus satisfaction, which ultimately impacts the degree of loyalty towards the firm.

2.4 Model

To maximize the value of this study, we made the decision to focus on two of the four service innovation perception dimensions, namely servicescape innovation and customer relations innovation. The decision ensures the practicability of the thesis, given the limited resources.

Furthermore, customer relations and servicescape innovations are considered as highly relevant from a theoretical point of view. It is argued that today's competitive economies are shaped by the assumption that customer retention can be seen as a way to relationship profitability (e.g. Fornell, 1992; Reichheld & Sasser, 1990; Zeithaml, Berry, & Parasuraman, 1996). Moreover, technological developments have substantially facilitated the establishment and maintenance of the relationship between the firm and the customer. As a consequence, we consider the examination of the perception of innovations by customers and their effect on loyalty as a highly valuable insight and theoretical contribution and furthermore aim to derive theoretical and managerial implications. Moreover, customer relationship has the immediate goal to establish loyalty, which is accomplished by a long-term relationship between firm and customers with repeat purchase (Heide, 1994).

Scholars have also recognized the importance of servicescapes. Similarly, as for customer relations innovation, progress in technology has considerably expanded, taking the examples of augmented and virtual reality into account. Consequently, we detect an opportunity to derive revealing insights for this sphere.

Apart from these theoretical and managerial point of views, we also find these dimensions highly suitable to be tested in a survey-based experiment, as our pre-test results, which will be discussed later, have revealed.

Based on this literature review we propose the following research model which is presented in Figure 3.

Figure 3: Suggested Research Model
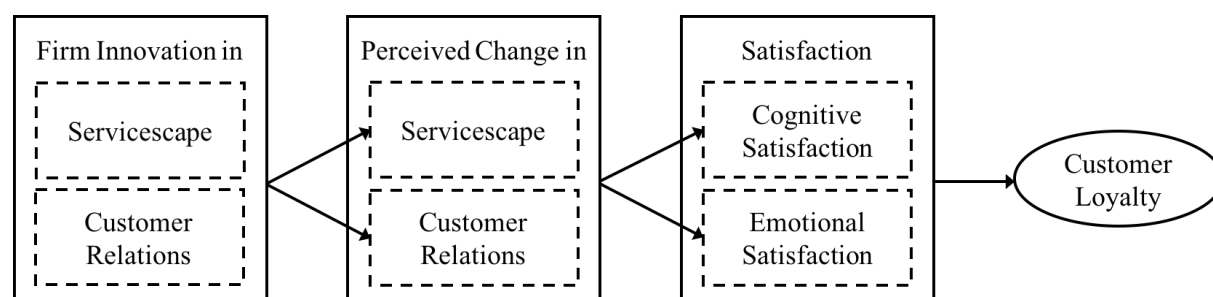
This model offers a general overview of the research aim, helping us to investigate the causal relationships between the independent variable firm innovations and the dependent variable customer loyalty. Within this relationship, two mediating variables are influencing the effect. Firstly, a firm's innovation leads to a perceived change in one or more of the two service

innovation areas. This again is expected to lead to a change in cognitive and emotional satisfaction. Ultimately, the dependent variable, customer loyalty, is influenced.

3 Development of Hypotheses

Several hypotheses shall be developed in this chapter following our suggested research model in order to test the latter.

3.1 Perception of Firm Innovation

Ultimately, firms strive for profitability, and to achieve this goal they can apply different strategies. For instance, they can aim to provoke growth and establish an outstanding reputation. A key aspect is to create a strong bond between the customer and the company in order to establish a solid customer base, since by retaining customers, firms can increase profits (Reichheld & Sasser, 1990). In competitive markets, firms have to maximise the service's value towards customers to make them loyal. The market for broadband and streaming services, for instance, is such a highly competitive market with firms like Netflix, HBO or Amazon Prime Video competing for market share by continuously innovating. Through regularly offering new features such as downloads for offline consumption or by publishing original content, Netflix, for example, managed to reach high retention rates (McAlone, 2017).

Customers are surprised by the possibilities of new technology and become loyal through firm innovations. We see that firms are incentivised to constantly improve and adapt service offerings according to customer preferences by applying client-focused innovation capabilities (Hogan, Soutar, McCool-Kennedy & Sweeney, 2011). Without innovating, firms risk to lose their customer base. BlackBerry, for instance, failed to keep up with the industry's development of innovations and was overtaken by its competitors (Gustin, 2013). Thus, we argue that firms need to innovate to stay in business and create customer loyalty:

> H1: Firm Innovation has a positive effect on customer loyalty.

3.2 Customer Perception of Firm Innovation

Doubtless, innovation leads to changes in an existing service offering or the creation of new services. Due to the multifacetedness of services and innovation, customers can experience service innovation on different levels. Research has illustrated that the majority of innovations are rather incremental and therefore, focus on smaller scopes of the business (Berry et al., 2006). To gain awareness of innovations, customers must perceive a change. Despite companies' extensive innovation efforts, customers may refuse to adapt an innovation "either because it

poses potential changes from a satisfactory status quo or because it conflicts with their belief structure" (Ram & Sheth, 1989, p.6). This phenomenon has been widely discussed in the literature under the term consumer resistance to innovations (e.g. Kleijnen et al., 2009; Ram, 1987). With this definition in mind, it follows that for consumers to resist or adapt an innovation, they have to perceive a deviation from the status quo - the service innovation.

3.2.1 Perception of a Servicescape Innovation

The servicescape functions as a vehicle of the image and relative quality of a service (Bitner, 1992) which is why it plays a crucial role in the customer innovation perception process. According to Bitner (1992), consumers perceive a servicescape through ambient conditions, space and functions, as well as signs, symbols and artefacts. In other words, it refers to the environment of a service.

With the quickly progressing digitalisation, companies innovate by extending their servicescape from physical to digital, thereby significantly changing the interaction (Van Riel et al., 2004). Traditional retailers such as Barnes & Noble, a book shop chain, for instance, started their e-commerce business in addition to their physical stores to keep up with competition. More recently, this development can also be observed in the opposite direction. Taking the example of Amazon into account, the virtual servicescape has recently been moved back to a traditional, physical service environment with the opening of the Amazon Go brick-and-mortar grocery store. Especially in the context of services, solely digital services or e-services, such as Airbnb and Uber have gained significant attention as well. Firms also innovate by expanding and modifying existing digital servicescapes by adding more functions and increasing user-friendliness of websites and applications as the e-scape is considered as a quality indicator for services (Ribbink, van Riel, Liljander & Streukens, 2004). Thus, a servicescape innovation is highly visible and easily perceivable. Hence, we expect that:

> H2: A servicescape innovation leads to a perceived change in the servicescape.

A servicescape innovation aims to improve the effectiveness and quality of the service environment. Within this scope, it aims to create a pleasant and comfortable setting for the customers. To achieve this, various service providers modify and innovate their servicescapes. One example is the introduction of complementary servicescapes. For instance, an increasing number of book retailers, such as Barnes & Noble, include coffee bars in addition to the regular book sales area (Barnes & Noble, 2017). Thereby, customers are incentivized to extend their

visits and to establish a deeper relationship with the respective store. The innovation creates a comfortable feeling and customers feel cared for. Based on this, we propose:

H3: A servicescape innovation leads to a perceived change in customer relations.

3.2.2 Perception of a Customer Relations Innovation

Establishing deep relationships with customers enables companies to gain valuable insights into the customer's mind and to facilitate customer retention. Loyalty programmes, as an example, serve as an instrument to create a bond between a firm and its customers (Berry, 1995; Hennig-Thurau & Klee, 1997). Through these programmes, firms are able to gather extensive data on their customers and purchasing patterns. Data is used to increase the level of personalisation in the service, for instance. As an example, airlines use gathered data to personally greet members of their loyalty program at check-in. Clearly, a customer relations innovation affects the customer journey directly and creates new touch points with the service provider. Thus, we expect the customer to perceive a change in the area of customer relations and propose the following hypotheses for an innovation in customer relations:

H4: A customer relations innovation leads to a perceived change in customer relations.

Many firms establish innovative loyalty clubs which enable the customer to enjoy a big range of benefits, such as discounts and exclusive promotions, or novel ways for customers to stay in touch with the firm, such as chatbots. The loyalty programmes require platforms, such as websites, apps or physical cards, with which the customer can access her benefits and make use of the range of offers within the programme. Taking the example of the Norwegian grocery chain Rema 1000 into the account, the company launched its benefit app "Æ" in 2017. The app brings a new, digital level to the grocery shopping experience by showing customers their personalised discounts in the store. Hereby, customers are incentivised to use their phone in the grocery stores as an additional shopping tool (Tønset, 2017). Hence, by creating a customer relations innovation, the company also made an impact on its servicescape through expanding into a digital sphere. Therefore, we posit:

H5: A customer relations innovation leads to a perceived change in servicescape.

3.2.3 Perception of Innovations in the Servicescape and Customer Relations

As argued above, we expect customers to perceive changes through innovations in the servicescape and in customer relations. But firms not only innovate in one area at a time and often either introduce innovations that cover multiple dimensions or release several service innovations simultaneously. Besides having opened brick-and-mortar stores, Amazon, for instance, constantly adds new innovative benefits to its loyalty program Amazon Prime (e.g. Perez, 2016; Perez, 2017). Customers of firms which innovate in different areas, will perceive changes in multiple areas. We expect that customers perceive changes in the dimensions servicescape and customer relations even stronger through overlapping effects, when they are presented with two innovations from the areas servicescape and customer relations. Thus, we posit:

> H6: The combination of a servicescape and a customer relations innovation leads to a higher perceived change in the servicescape than one innovation alone.

and

> H7: The combination of a servicescape and a customer relations innovation leads to a higher perceived change in customer relations than one innovation alone.

3.3 Cognitive and Emotional Satisfaction

Customers experience and process services via two channels: the cognitive and the emotional (or affective) channel. Customers evaluate a service on both levels (Carbone & Haeckel, 1994; Chaudhuri & Holbrook, 2001; Liljander & Strandvik, 1995; Mano & Oliver, 1993). Whereas the cognitive route rather concerns functional elements of the service experience, the affective route incorporates the experiential scope (Kunz et al., 2011).

3.3.1 Cognitive Satisfaction

Oliver (1980) finds that the consumer conducts a comparison between a perceived service performance and her expectations. Thus, we expect the perceived changes in servicescape and in customer relations to provoke an adjustment in the consumer's expectancy-disconfirmation assessment. Pleasant surroundings, both physical and digital are a crucial factor for a satisfying consumption experience. To follow up on the example of Barnes & Noble, customers could be positively surprised to see a coffee bar in a book store, which exceeds their expectations.

Consequently, we argue that a perceived change in servicescape caused by a servicescape innovation positively influences cognitive satisfaction. This also affects digital servicescapes as Ribbink et al. (2004) find a positive link between e-scape and e-satisfaction. This finding is supported by van Birgelen, Ghijsen and Semeijn (2005). Therefore, we posit:

> H8a: A perceived change in the servicescape has a positive effect on cognitive satisfaction.

Habit is an important aspect for the consumption experience. Everday purchasing efforts are not exclusively led by conscious thinking, but often by routines (Hoyer, MacInnis & Pieters, 2013). A change in the servicescape, such as an innovative way of store modelling for instance, may interfere with a customer's habitual purchasing patterns and result in her looking for possible alternatives (Moe & Yang, 2009). A grocery store, for example, might remodel the setup of shelves and build a path that forces customers to pass certain aisles. Customers could assess this as a deterioration in their grocery shopping experience, since they are deprived of time. Moreover, Dagger and Danaher (2014) find that, whereas overall satisfaction increases on the short term after a store remodelling, it decreases in the long term. The innovated servicescape may be associated with a negative experience for customers. Hence, we argue:

> H8b: A perceived change in the servicescape has a negative effect on cognitive satisfaction.

Customer relations enhance and extend a consumption experience. They often provide more personalized experiences and exclusive access to promotions which trigger positive associations for customers. Frequent flyer programs, for instance, provide privileges such as access to exclusive areas in an airport or personal assistance, which a customer did not receive before entering the program. Studies have shown a positive effect of service personalisation (e.g. Ho & Kwok, 2003). Moreover, receiving personalized services positively affects the perception of overall service quality (Mittal & Lassar, 1996). Hence, we posit:

> H9a: A perceived change in customer relations has a positive effect on cognitive satisfaction.

Nonetheless, some customer relations innovations can also be perceived negatively, by triggering privacy concerns, if they become too intriguing (e.g. if private borders are crossed). Considering the example of Target, the firm started analysing customers' shopping behaviour

and created a pregnancy-prediction model. Being able to predict a customer's pregnancy, the firm started offering pregnancy related products at reduced prices to respective customers, only to find out in hindsight that customers felt spied on (Duhigg, 2012). This notion is supported by Suprenant and Solomon (1987) who find that personalisation does not necessarily increase customer satisfaction. Due to potential data collection and tracking of purchases, customer relations can invade customers' privacy, resulting in a negative experience (Phelps, Nowak & Ferrell, 2000).

> H9b: A perceived change in customer relations has a negative effect on cognitive satisfaction.

3.3.2 Emotional Satisfaction

Several studies find that emotions are an independent and significant factor for satisfaction (Martínez Caro & Martínez García, 2007; Westbrook, 1897). Consequently, we consider emotions not as a mediator, but as an independent factor for satisfaction.

The perception of a servicescape leads to effects in terms of emotion, more specifically pleasure-displeasure and degree of arousal (Bitner, 1992). Aal, Di Pietro, Edvardsson, Renzi and Guiglielmetti Mugion (2016) have demonstrated that a servicescape innovation enhances the customer experience and therefore influences the customer's cognitive, emotional and behavioural responses (Johnston & Clark, 2001). While there is still a debate on whether customers first think or feel when entering a servicescape, there is a consensus that emotional processing is present (Lin, 2004). Martin, O'Neill, Hubbard & Palmer (2008) demonstrate that the affective scope is an important part of overall satisfaction. Scents used by cafés or shops are an example of firms enhancing their servicescape to manipulate customers and create a positive feeling. In such a situation, the scent could trigger the customer to remember specific memories and feel stimulated or excited. Thus, we posit:

> H10a: A perceived change in the servicescape has a positive effect on emotional satisfaction.

Arguably, a change in a servicescape can trigger negative emotions such as anger and frustrations, if it disrupts heavily with our routines, for instance. Donovan, Rossiter, Marcoolyn and Nesdale (1994) support that certain store environments can lead to negative emotions of the customer, resulting in spending less time and money. A servicescape could be perceived as

inconvenient when a customer does not find her way to a specific product, for example. An inconvenient servicescape innovation can lead to frustration and switching behaviour (Grace & O'Cass, 2004; Wakefield & Blodgett, 1996). Thus, we argue:

H10b: A perceived change in the servicescape has a negative effect on emotional satisfaction.

Customer relations innovations have the goal to strengthen the bond between the customer and the firm and aim to maximize the benefit of the customer journey. By strengthening this bond, firms tap upon the emotional satisfaction of the customer by creating positive feelings towards a service. When we feel appreciated and happy because of a customer relations innovation, this will result in emotional arousal. For instance, a customer might receive a discount on an item whose purchase she has considered for a while, through taking part in a loyalty program. In such a case, the customer will feel pleased, happy and taken care of. Hence, we expect that a customer relations innovation causes positive emotions:

H11a: A perceived change in customer relations has a positive effect on emotional satisfaction.

While a customer relations innovation can certainly evoke positive emotions, the same innovation can cause negative feelings simultaneously, due to a breach of privacy, for instance. According to the concept of consumer ambivalence, a service can consist of both positive and negative feelings (Otnes, Lowrey & Shrum, 1997). Taking the growing usage of chatbots for customer relations communication as an example, the technology evidently bears advantages for firms. Nonetheless, customers may feel betrayed as they expect to talk to an employee, but eventually find out that it is an automated bot, resulting in negative affective reactions. Thus, we posit:

H11b: A perceived change in customer relations has a negative effect on emotional satisfaction.

3.4 Customer Loyalty

Existing literature shows a positive link between customer satisfaction and customer retention, which serves as an essential element of customer loyalty (e.g. Fornell, 1992; Jones & Sasser, 1995).

The study of customer satisfaction has been a core element of service research ever since. There is wide consent within service loyalty research, that customer satisfaction is closely related to loyalty (e.g. Dean, 2004; Dick & Basu, 1994; Fornell, 1992; Garbarino & Johnson, 1999). Nonetheless, scholars are debating about the separate effects of both dimensions. There is a wide consensus that satisfaction is processed both via a cognitive and an emotional channel. Generally, research constitutes a significant positive relationship between both cognitive and emotional satisfaction, and customer loyalty (Yu & Dean, 2001).

3.4.1 Cognitive Satisfaction and Loyalty

Several studies which apply the disconfirmation model have already linked the cognitive satisfaction component positively to customer loyalty (e.g. Andreassen & Lindestad, 1988; Colgate & Stewart, 1998). The disconfirmation-of–expectation paradigm (Oliver, 1980) argues that customer loyalty is a function of customer satisfaction, which again comprises a cognitive comparison. The comparison is made between expectations before the purchase and the actual experience. Thus, we follow that consumers who experience an increase in cognitive fulfilment will further pursue the relationship with a service provider (Chaudhuri & Holbrook, 2001). Hence, if the customer experience is satisfying, customers are more inclined to be retained. Consequently, we reason:

H12: Increased cognitive satisfaction positively affects customer loyalty.

However, in line with previous arguments, change can be perceived negatively, resulting in a lower cognitive satisfaction level. Hence, we propose that:

H13: Decreased cognitive satisfaction negatively affects customer loyalty.

3.4.2 Emotional Satisfaction and Loyalty

Several researchers have demanded higher consideration of affect in studies regarding the relationship between satisfaction and customer loyalty. The cognitive dimension alone is not sufficient to predict customer loyalty (Stauss & Neuhaus, 1997). In accordance with Liljander and Strandvik (1997) we argue in favour of emotions as a crucial component of satisfaction. Moreover, it has been found that affect constitutes a better indicator in terms of satisfaction for customer loyalty (Yu & Dean, 2011). Martin et al. (2008) as well as White and Yu (2005) find that emotional satisfaction is an important precedent for customer loyalty. In addition to that, the findings of Wong (2004) show a positive link between service quality and emotional

satisfaction which again is positively associated with customer loyalty and relationship quality. Thus, we propose that positive emotions derived from service innovations lead to loyalty towards an organization and the products (Bitner, 1992).

H14: Increased emotional satisfaction positively affects customer loyalty.

In accordance with our argumentation for cognitive satisfaction, customers can experience a lower level of emotional satisfaction after perceiving a service change caused by an innovation in the servicescape or customer relations. Therefore, we propose:

H15: Decreased emotional satisfaction negatively affects customer loyalty.

Table 1 provides an overview of our posed hypotheses that shall be tested, while Figure 4 illustrates the respective ties between our variables.

Table 1: Overview of Hypotheses

Hypothesis	Variable Relationship	Direction
H1	Firm Innovation -> Customer Loyalty	+
H2	Servicescape Innovation -> Perceived Change in Servicescape	+
H3	Servicescape Innovation -> Perceived Change in Customer Relations	+
H4	Customer Relations Innovation -> Perceived Change in Servicescape	+
H5	Customer Relations Innovation -> Perceived Change in Customer Relations	+
H6	Servicescape + Customer Relations Innovation -> Higher Perceived Change in Servicescape	+
H7	Servicescape + Customer Relations Innovation -> Higher Perceived Change in Customer Relations	+
H8a	Perceived Change in Servicescape - > Cognitive Satisfaction	+
H8b	Perceived Change in Servicescape - > Cognitive Satisfaction	-
H9a	Perceived Change in Customer Relations - > Cognitive Satisfaction	+
H9b	Perceived Change in Customer Relations - > Cognitive Satisfaction	-
H10a	Perceived Change in Servicescape - > Emotional Satisfaction	+
H10b	Perceived Change in Servicescape - > Emotional Satisfaction	-
H11a	Perceived Change in Customer Relations - > Emotional Satisfaction	+
H11b	Perceived Change in Customer Relations - > Emotional Satisfaction	-
H12	Increased Cognitive Satisfaction -> Customer Loyalty	+
H13	Decreased Cognitive Satisfaction -> Customer Loyalty	-
H14	Increased Emotional Satisfaction -> Customer Loyalty	+
H15	Decreased Emotional Satisfaction -> Customer Loyalty	-

Figure 4: Hypotheses
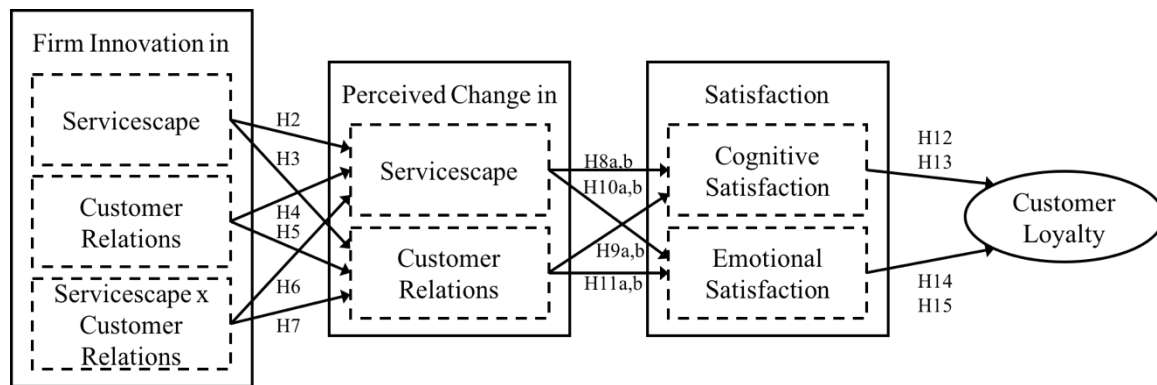
4 Methodology

To test our hypotheses, we have to choose an appropriate research methodology (Saunders et al., 2016). Such a research method comprises of decisions on the research purpose, the research approach, the research strategy, techniques for data collection and the development of measurements, measures to ensure reliability and validity, and ethical considerations.

4.1 Purpose of the Research

The research purpose depends on the research question that we seek to answer and can be classified into the three areas of exploratory, descriptive and explanatory research (Saunders et al., 2016).

According to Robson (2002), exploratory studies help seeking new insights and asking questions to assess phenomena in a new light. Saunders et al. (2016) explain that these studies are particularly useful, when the target is to build a precise understanding of a problem. A descriptive research, on the other side, focuses on portraying an accurate profile of events, situations or people (Robson, 2002). According to Saunders et al. (2016), this type of research is rather a part of an exploratory or explanatory research, than a research on its own. Explanatory studies establish causal relationships between variables (Saunders et al., 2016.).

Since our research focuses on explaining the relationship between service innovations of firms and customer loyalty, a causal analysis is required. Thus, our research is to be classified as an explanatory study.

4.2 Research Approach

According to Saunders et al. (2016), there are two approaches regarding the research design: the deductive and the inductive approach. While the deductive approach focuses on developing a theory and then testing the respective hypotheses, the inductive approach involves data collection that sets the basis for a following development of theory (Saunders et al., 2016.).

Since we first state a distinct theoretical position and develop hypotheses based on this position, before collecting and analysing data to test our statements, our study takes a deductive approach.

4.3   Research Strategy

Generally, the research strategy, or research design, entails the underlying plan to be followed in order to answer the research question appropriately (Saunders et al., 2016). With a suitable design, we can ensure that our "substantive and statistical assumptions for the data analysis, such as the assumptions that permit strong causal inferences, are met" (Smith, 2014, p. 27). Therefore, a sound choice of research design is crucial. The ultimate choice of research design depends on various factors, such as the question we seek to answer, existing knowledge, as well as time and other resources (Saunders et al., 2016).

4.3.1   Choice of Research Strategy

As presented in the literature review, service innovation can be experienced by the customer via different dimensions which may have effects on customer loyalty. In order to answer our posed research question, we need to study causal links. While causality cannot be directly observed, we can design our research in a way that allows to infer a causal relationship (West, Cham & Liu, 2014). With an experiment, we can test whether the change of the independent variable effects a change in the dependent variable (Saunders et al., 2016). Thus, we conduct an experiment as well as a pre-test. Due to their origin in the field of science, experiments are treated as the gold standard among all research strategies (Saunders et al., 2016).

4.3.2   Experimental Design

To assess the impact of an independent variable on a dependent variable, the former is manipulated intentionally in an experiment (Ruane, 2004). Such a research design can involve the manipulation of one or multiple independent variables and requires that participants are assigned randomly to different treatments (Smith, 2014). The participants are placed into treatment groups, which are either confronted with the manipulation or serve as a control group, in which no intervention takes place. Ideally, the aspect of being confronted with a manipulation or not, is the only differentiator between the groups (Saunders et al., 2016).

In general, research differentiates between informal and formal experimental designs, whereas the latter offer a higher level of control and precision in statistical analysis (Kothari, 2004). We decide to apply a formal design, the factorial approach, which is suitable for testing the effects of more than one factor (Kothari, 2004). Our experiment will test the effect of innovations in the servicescape (A) and in customer relations (B) on customer loyalty. We decide to

manipulate these two, as they are very concrete, easily portrayable in the experiment and are expected to have a major impact on customer loyalty. The table below shows the factorial setup of our experiment.

Table 2: Overview of Factorial Approach

	Servicescape Innovation not presented - A1	Servicescape Innovation presented - A2
Customer Relations Innovation not presented - B1	Observation 1 (O1)	Observation 2 (O2)
Customer Relations Innovation presented - B2	Observation 3 (O3)	Observation 4 (O4)

We randomly assign participants to one of the four observation groups. Each of the observation groups is presented with a different case portraying different types of innovations or no innovation. After reading their assigned case, participants fill out a survey, which is the same for each treatment group. An overview of all treatment groups is presented in Table 2. Observation group 1 (O1) functions as a control group and receives a case without an innovation. Observation group 2 (O2) receives a case with a servicescape innovation and observation group 3 (O3) is presented with a case containing a customer relations innovation. The last observation group (O4) receives a case with both servicescape and customer relations innovations.

4.4 Experiment Setup

4.4.1 Setting of the Experiment and Participants

We made the decision to collect the experiment data through an online questionnaire over the web-survey platform Qualtrics. By collecting primary data, we keep control over data assembly and can decide on the sample structure ourselves. We choose a cross-sectional research design, which gives us data for a specific point in time and is more resource-efficient compared to longitudinal studies (Saunders et al., 2016). The data collection took place over a period of 14 days in October and November 2017 and participation was voluntary.

In general, the target population for our research can be narrowed down to individuals with legal competent age, since all these are considered customers. Due to budget and time constraints that characterise a master´s thesis, it was impractical for us to investigate the whole

population. In terms of sampling, we decided against probability sampling, which is very time and resource consuming as well (Saunders et al., 2016), and in favour for convenience sampling, which solves our time and resource constraints. We distributed our online survey through posts in Facebook groups of NHH and CEMS students, and thus targeted people in the age range between 20 and 30 years that have a background in business. Additionally, students and people in that age range are most likely familiar with the experiment company IKEA and have already spent money on furniture there. Thus, we gathered data from a very homogeneous group of people. To motivate people to participate in our survey, respondents received the chance to win one out of five Amazon.com vouchers with a value of €50. Taking into account that chances of winning are low, it is considered as a good incentive to participate, without encouraging careless responses only for the purpose of being rewarded.

4.4.2 Data Collection Procedures

As mentioned above, we applied the online research tool Qualtrics to conduct our experiment. Each participant was confronted with an introduction of our survey before being randomly assigned to one of the four cases. The introduction was not fully informing about the purpose of the study to avoid researcher-desirable answers. Participants did however not receive any wrong or misleading information about the survey's purpose either so that no deception took place (Hey, 1998). The subsequent cases were presented in words. To engage respondents from the very beginning, to increase attention and to ensure that respondents are answering correctly, the texts were kept concise and graphical elements were added.

All four cases, the one for the control group and those for the three treatment groups, opened with identical general information about the case company, since it was important to bring the participants on a similar level of knowledge about the firm. This general information comprised of an overview of IKEA and its main target for the future. No information about the company was given that could lead the respondents to think about innovations the company introduced or other aspects that might contaminate the answers of the control group.

In addition to the general information, the three treatment groups were then presented with the respective manipulation: A case that described one or both of the innovations in customer relations and the servicescape. The development of these cases as well as our choice of a case company is discussed in the following sections. The specific information that was presented to the respondents can be found in Appendix B: Experiment Introduction and Cases.

As it is crucial to ensure randomisation (West et al., 2014), we applied a randomisation function within Qualtrics: The chance for each participant to receive one case of the four available was 25%.

4.4.2.1 The Case Company

Subject of the experiment was IKEA, which is known for furniture, kitchen appliances and home accessories. The firm operates in 49 countries today and has become established as a globally well-known brand, making it a suitable object for our experiment. We chose the company for multiple reasons. Firstly, IKEA is widely known and popular, which reduces the risk of having different knowledge levels between respondents of our survey, and thus minimises the risk of biased answers. Secondly, the firm serves as an ideal example for service innovation, as it is currently leading the Norwegian Innovation Index which examined the innovativeness of over 38 companies from 19 industries perceived by customers (Norsk Innovasjonindeks, 2017). And thirdly, IKEA has been extensively applied in research on service innovation (Edvardsson & Enquist, 2009; Edvardsson & Enquist, 2011; Edvardsson & Tronvoll, 2013). Moreover, it has been leading in integrating customers in service production and consequently its service innovation (Edvardsson, Gustafsson, Kristensson & Witell, 2010).

4.4.2.2 Innovation Cases

Following the outlined factorial approach, we test the effect of several independent variables on the dependent variable customer loyalty. These independent variables are no innovation (*O1*), servicescape innovation (*O2*), customer relations innovation (*O3*), as well as the combination of the servicescape and the customer relations innovation (*O4*). For each innovation case, we prepared a text-based scenario with additional graphical elements, to portray the respective independent variable without explicitly mentioning it.

Both innovations used for the respective cases were derived from real innovations that IKEA had recently introduced. For the servicescape innovation, we described an augmented reality catalogue that allows customers to digitally set up furniture in their homes and test how it fits and looks. For the customer relations innovation, we portrayed the company's loyalty programme and two new features that were added to the benefits. Both innovation descriptions were developed in a shorter and in a longer and more detailed version.

Based on these descriptions, we conducted a pre-test, with which we were able to determine how well the cases were constructed (Hunt, Sparkman & Wilcox, 1982). To ensure that the respective independent variables were in line with the desired construct, we checked whether the participants would categorize the perceived manipulations in the same service innovation dimension as we intended. For the pre-test, we prepared the long and short versions for each of the cases and focused on writing in a neutral, descriptive manner to avoid a priming effect on innovation and biases (Fink, 1995). The pre-test was carried out via a survey among university students at NHH who we randomly approached in the school canteens. The students received a brief explanation of all four service innovation perception dimensions and either all short case versions or all long ones – in total, both versions were delivered to 24 participants each. Participants had to indicate via a 7-point Likert scale, to which extent the cases referred to one of the four service innovation areas.

The analysis of the pre-test revealed critical insights. The cases, both for no innovation and innovation, reached a satisfying result in the long and the short version, while the results for the short cases were even stronger. While we initially prepared a case for an innovation in service delivery, we observed a diverging result. The majority of participants recognized an innovation in the servicescape for the long and the short service delivery innovation case. After a thorough revision of the conceptualisations of service delivery and servicescape, we concluded that the servicescape of a service poses a significant precondition for service delivery to take place. After a thorough evaluation we then decided to exchange the independent variable *service delivery innovation* with *servicescape innovation,* remaining with an unaltered case text.

Other than that, the pre-test confirmed the design of our manipulations and we were able to check and strengthen the construct validity of our experiment. Due to a higher score, we then decided to utilize the short case versions in our experiment. Both, the long and the short case versions, as well as the setup of our pre-test can be found in Appendix A: Pre-Test.

4.4.2.3 Experiment Flow

In order to summarize the experiment design, Figure 5 has been created. The experiment flow chart outlines all paths of the experiment, whereas the participants were assigned randomly to one of the cases. This process was ensured by applying a randomizer function in the survey flow settings of Qualtrics and guaranteed that we reach a sufficient number of participants for each flow branch.

Figure 5: Survey Flow
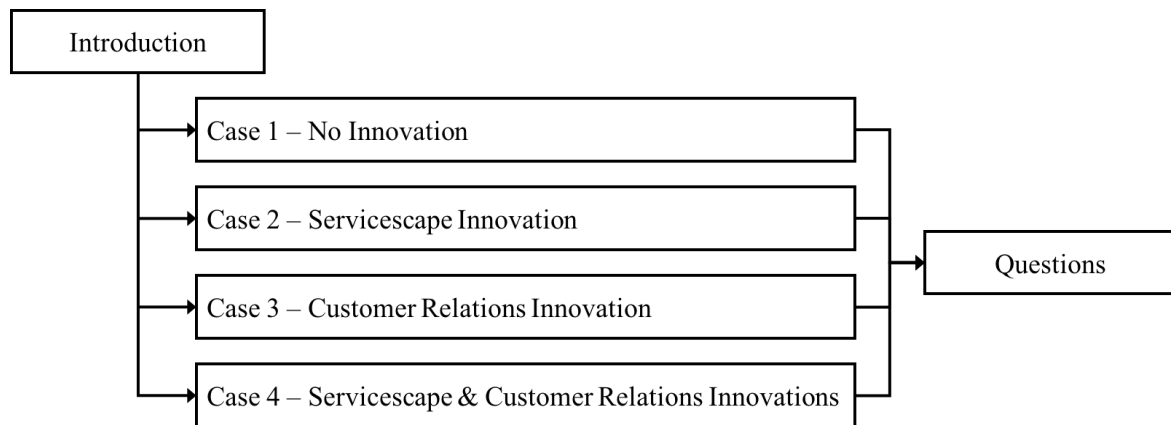
4.5 Measures

An important aspect of deductive research is the operationalisation of the concepts to allow for a quantitative measurement (Saunders et al., 2016). For this, we identified the variables, that we needed to collect data about. To test the posed hypotheses, we measured the variables *perceived innovativeness*, *perceived service innovation* in the four dimensions (core service, service delivery, servicescape, customer relations), *emotional and cognitive satisfaction*, and *customer loyalty*.

For the measurement of each variable, we used multiple similar questions to strengthen measurement validity. To measure *cognitive and emotional satisfaction*, we used a semantic differential rating scale, as it is particularly suitable to determine underlying attitudes of customers (Saunders et al., 2016). By setting up similar questions in a matrix form, we simplified the questionnaire for the respondents. All items were measured on a 7-point Likert scale, which allows respondents without an opinion to give a neutral answer. Furthermore, we avoided confusion of the respondents by using a consistent scale throughout the questionnaire (Saunders et al., 2016). The scales had both numbers and explanatory text, to further simplify the respondents experience with the questionnaire.

In order to maximize construct validity, we made use of existing and proven measures. In total, the questionnaire consisted of 27 items that measured the respective variables. Additionally, we included three questions to gather demographic data. We only applied close-ended questions, since they are easier to interpret and are more suitable for statistical analyses (Fink, 1995). The first set of questions measured *cognitive and emotional satisfaction*. The measures were adapted from Russell and Mehrabian (1977).

The subsequent items measured the four service innovation dimensions respectively and were developed at the Center for Service Innovation (CSI) by Lervik-Olsen et al. (2016). Lastly, for the variable *customer loyalty*, we adapted measurements from Cronin et al. (2000).

Moreover, despite not being relevant for this study, we included items measuring the concepts of perceived innovativeness and relative attractiveness in order to facilitate further research on the study by the NHH CSI. The measures were adapted from Kunz et al. (2011) and Andreassen & Lervik (1999) respectively.

The complete setup of the question section in our survey can be found in Appendix C.

4.6   Ensuring Validity and Reliability

To ensure validity and reliability, we considered a range of factors while setting up the research design. The validity of a research is concerned with the results and whether they are about what they are supposed to be about (Saunders et al., 2016). Reliability, on the other hand, describes the consistency of findings which depends on the applied data collection and analysis techniques (Saunders et al., 2016).

By using established constructs to measure the respective variables in our questionnaire, we increased construct and content validity by capturing what is implied by our variables. Furthermore, we decreased the risk of wrong or biased answers by conducting a pre-test. In doing so, we ensured that our manipulations are about what they are supposed to be about and that they are understood by respondents of our survey.

To secure external reliability, we looked at different factors. To avoid participant error, we introduced respondents to the topic of our research, reducing the risk of respondents not being experienced in the topic. Moreover, we eliminated those responses where participants evidently had not read their respective case.

Regarding participant bias, we guaranteed anonymity to respondents, thereby avoided answers that are considered socially unacceptable. Participants were informed, that their anonymity was kept, even if they took part in the gift card draw, which was conducted in a separate survey.

By directly importing the data from the online-survey platform Qualtrics into SPSS, we eliminated the risk of errors from manual data entry, reducing the chances of researcher error. Furthermore, we limited the risk of researcher bias by using close-ended, structured questions,

which are not affected by subjective interpretation like open-ended questions are. As a step to avoid researcher desirable answers, we did not inform participants about the complete purpose of our survey and excluded any priming wordings in the cases we presented to the respective groups.

4.7   Ethical Considerations

According to Saunders et al. (2016) a number of ethical issues can arise during the different stages of a research project. These issues can concern the privacy and anonymity of participants, the possibility for participants to withdraw from the process, the confidentiality of data, and also the potential effects of reported data on participants (Saunders et al., 2016). To avoid such ethical issues, we took several measures in relation to our data gathering.

Participants were informed about the general purpose of the study and by conducting an online experiment, we allowed participants to withdraw from the process at any time. Moreover, we ensured privacy by not collecting any personal data and storing the responses anonymously. Participants that decided to take part in the draw, were forwarded to a separate survey, where their information was saved entirely independent from the responses to our questionnaire. The participants' e-mail-addresses were only used for drawing the winners and deleted subsequently. And since the data collection took place via the internet, it is important to mention that all collected data was only accessible to us and to no third party.

Lastly, it has also been clarified at the end of the experiment that IKEA is not affiliated with the study. Thereby, we underlined that the provided answers are confidential and will not be used by IKEA for commercial purposes.

5   Analysis and Results

This chapter will provide an overview of our data analysis process as well as the results and findings. After the sample and data screening, we will present the conducted confirmatory factor analysis as well as the structural equation modelling and will finally conclude with the hypotheses testing.

5.1   Sample and Data Screening

In total, we collected data from 246 participants, of which 61 did not complete the survey. We used the "force response" function in Qualtrics to prevent respondents from continuing the survey without responding to all questions, which resulted in a response rate of 75,2%. This response rate is found to be highly satisfactory as it is to be considered above average (Baruch & Holtom, 2008).

Despite our precautions within the setup of the data collection, there is a possibility of careless responses. These can occur due to shortcomings beyond our ability to control, such as lack of respondent interest or environmental distraction (Meade & Craig, 2012). Thus, in the next step, the quality of responses was assessed with the goal to detect such careless responses, which is especially relevant for internet-based survey research (Meade & Craig, 2012). Careless responses constitute a substantial threat for data analysis as they "do not accurately reflect respondents' true levels of the constructs purportedly being measured" (Meade & Craig, 2012, p. 1). Moreover, they can have considerable effects on the inter-item correlations, thus leading to distorted results.

Firstly, we apply a post-hoc response time approach in order to identify possible careless responses. This approach is based on the assumption that a shortened response time causes a lack of cognitive processing of the survey (Huang, Curran, Keeney, Poposki & DeShon, 2012). Therefore, we took the reading time for each case text into account with regards to the respective length of the case, since it is important that each participant receives the complete assigned treatment (West et al., 2014). Consequently, respondents with a reading time of less than 5 seconds for case 1 (N=12), less than 15 seconds for case 2 (N=13), less than 15 seconds for case 3 (N=16) and less than 22.5 seconds for case 4 (N=19) were excluded. Secondly, we checked the standard deviation for all respondents and detected one conspicuous response with only neutral values, which was eliminated as well. After minimizing unengaged and careless

responses, the final number of datasets was 124, which still is a size that bears a reasonable margin of error for the estimated target population (Saunders et al., 2016). The final number of responses consisted of 32 datasets for both observation 1 and 2 and 30 for both observation 3 and 4.

Table 3 presents the recorded demographics of our final sample.

Table 3: Sample Demographics

Construct	O1 (N=32)	O2 (N=32)	O3 (N=30)	O4 (N=30)	Full Sample (N=124)
Gender					
Male	46,9%	46,9%	40,1%	46,7%	45,2%
Female	53,1%	53,1%	59,9%	53,3%	54,8%
Education Level					
Secondary school	3,1%	0,0%	3,3%	0,0%	1,6%
University/ college ≤ 3 years	15,5%	21,7%	0,0%	13,2%	12,9%
University/ college > 3 years	81,4%	78,3%	96,3%	86,8%	85,5%
Age					
18 to 24 years	37,6%	50,0%	30,2%	63,2%	45,2%
25 to 54 years	62,4%	46,9%	66,5%	36,8%	53,2%
55 to 64 years	0,0%	0,0%	3,3%	0,0%	0,8%
Age 65 or older	0,0%	3,1%	0,0%	0,0%	0,8%

In addition to eliminating careless and incomplete responses, we checked the dataset for outliers. Since we did not have any continuous variables, we only examined the recorded demographic data. As observable from the table above, two outliers in the categories education and age can be identified. But since these factors are not specifically relevant for our model, the respective responses were not excluded from the study.

5.2   Data Analysis

5.2.1   Method

To analyse the gathered data, we apply structural equation modeling (SEM) which is a highly suitable statistical method for testing causal relationships between latent constructs (Hair, Black, Babin & Anderson, 2010). Latent variables are characterised by being non-measurable by generally accepted measuring instruments. Therefore, they have to be determined by

indicators (Blunch, 2008). Our constructs comply with these characteristics, making SEM an efficient and adequate tool to test the model.

As the data have been gathered via Likert-type scales, they are of ordinal nature. This requires the application of special estimators since they are not continuous and therefore, do not have metric properties. Usually, the ordinal approach involves the estimation of polychloric, polyserial and other correlations for the variables. This is followed by an estimation of the parameters of the model by applying weighted least squares with a weight matrix which has to be consistent with the estimate of the asymptotic covariance matrix of the calculated correlations from the first step (Jöreskog, 1994). However, the sample size proved to be too small to calculate asymptotic covariance matrices. Consequently, we made the decision to opt for the second-best choice, namely applying a maximum likelihood (ML) estimator which is the most widely applied SEM estimator (Hox & Bechger, 1999). The ML estimator relies on reproducing the covariance matrices of the variables by applying the means of model parameters (Crisci, 2012).

A crucial prerequisite for this estimator is normal distribution of the data, therefore, all items have been checked for normality (Russell, Kahn, Spoth & Altmaier, 1998). To test the data for normality we applied the Kolmogorov-Smirnov and Shapiro-Wilk test in the statistics software SPSS. Both tests compute the significance for the differences from normality (Hair et al., 2010). As reported in Appendix E: Normality Test, all construct items are statistically significantly different from normal distribution and ergo are non-normally distributed. Due to the small sample size of N=124 this finding came not unexpected. As Hair et al. (2010) recognize, the smaller the sample, the less valid both applied tests are. Consequently, we also took skewness and kurtosis as well as the normality plots of the construct items into consideration. The skewness and kurtosis values of the constructs are illustrated in Appendix F: Descriptive Statistics. Following West, Finch and Curran (1995), we consider an absolute skew value of >2 and an absolute kurtosis value of >7 as a deviation from normality. None of these thresholds is exceeded by any of the constructs, suggesting sufficient normal distribution, even though we have to recognize that the kurtosis and skewness of the item loyalty 1 are rather high, but still within the acceptable threshold. This has been supported by the consideration of the normality plots generated by SPSS. Therefore, the distribution of the data was found acceptable in terms of normality and we proceed with the confirmatory factor analysis and structural equation modelling in order to test our hypotheses.

5.2.2   Confirmatory Factor Analysis

To assess the goodness-of-fit of our model, a Confirmatory Factor Analysis (CFA) was conducted with the software Mplus 8. The CFA allows to test how well our theoretical model matches the data we gathered by assessing the contribution of each item to the respective construct (Hair et al., 2010). Moreover, to gather adequate evidence for model fit, Hair et al. (2010) suggest to make use of multiple fit indices, of which at least one should be an incremental and one an absolute index. By reporting normed chi-square ($\chi 2/df)$, the root mean square error of approximation (RMSEA), the standardized root mean residual (SRMR), the Tucker-Lewis Index (TLI) and the comparative fit index (CFI), we are following this suggestion.

Concerning the absolute fit indices, the normed chi-square shows a good fit with a value of $\chi 2/df = 1,7$. The RMSEA (0,076) still indicates a reasonable error of approximation in the population but is close to a cutoff value that is mentioned by some researchers (Hair et al., 2010). This result is also due to the rather small sample size, as the RMSEA is expected to be higher with smaller sample sizes and samples with a small amount of degrees of freedom (Taasoobshirazi & Wang, 2016). Given the computed RMSEA value, some caution regarding the further data analysis is required, but it can nonetheless be proceeded. Slightly better and certainly acceptable fit is shown by the SRMR (0,068).

Regarding the incremental fit indices, we recognize that TLI (0,956) is showing good fit, while the CFI value (0,944) is slightly below the range indicating good fit. However, Hair et al. (2010) argue, that there is not one single cutoff for fit indices and an index above 0,9 is still considered acceptable as well.

Table 4: Goodness-of-Fit

	Abbreviation	Ranges indicating good fit*	Measurement
Chi-square	χ2	n.a.	160,5
Degrees of freedom	df	n.a.	94
Normed chi-square	χ2/df	≤ 3	1,7
Root mean square error of approximation	RMSEA	< 0,08	0,076
Standardized root mean residual	SRMR	< 0,08	0,068
Tucker-Lewis Index	TLI	> 0,95	0,956
Comparative fit index	CFI	> 0,95	0,944

(* The ranges indicating good fit are based on Hair et al. (2010) and Bollen & Long (1993))

According to Hair et al. (2010), the CFA enables us to reject or confirm our theoretical model. While the respective goodness-of-fit values are not showing entirely perfect fit, the CFA does not suggest a problem with fit either. Considering this, we are continuing with our proposed research model.

5.2.3   Construct Validity

Construct validity is concerned with the extent to which the measurement items represent the theoretical content they are supposed to measure (Hair et al., 2010). To assess construct validity, we are discussing the respective components convergent validity and discriminant validity. Furthermore, we test whether common method bias is a concern to the study.

Regarding convergent validity, we are examining the factor loadings of our measured items to estimate the extent to which the items of the respective constructs converge or share a high rate of variance (Hair et al., 2010). It can be seen in Table 5 that all loadings of the items of the four constructs cognitive satisfaction, customer relations innovation, servicescape innovation and customer loyalty are above 0,8, which suggests a high convergence validity. The first item of the construct emotional satisfaction shows a loading (0,4) that is only minimally acceptable according to Hair et al. (2010), while the average loadings of this construct are above 0,65. Taking out the item EMO_1 is not an option, since we only have three items for the construct, which is the minimum. Moreover, eliminating the whole construct from the model did not increase model fit effectively. Thus, we decided to accept the low loading of the discussed item and include it in the subsequent analyses.

Additionally, we determined the average variance extracted (AVE) as well as the construct reliability (CR). According to Hair et al. (2010), CR values above 0,7 suggest a good reliability, and since all constructs score a CR of 0,7 or higher, convergent validity is indicated. Concerning AVE, we generally receive values suggesting adequate convergence, though the construct emotional satisfaction reaches a score that is slightly below the desired value of 0,5. This could indicate, that there is a higher level of errors left in the items than variance explained by structure of the latent factors which have been appointed on the measure (Hair et al., 2010).

Table 5: Constructs, Items and Convergent Validity Measures

Construct	Item	Description	Loadings	CR	AVE
Emotional Satisfaction	EMO_1	unaroused - aroused	0,40	0,70	0,46
	EMO_2	relaxed - stimulated	0,73		
	EMO_3	calm - excited	0,83		
Cognitive Satisfaction	COG_1	disappointed - contented	0,85	0,92	0,74
	COG_2	unhappy - happy	0,83		
	COG_3	annoyed - pleased	0,86		
	COG_4	unsatisfied - satisfied	0,89		
Customer Relations Innovation	REL_1	The way IKEA treats you as a customer?	0,91	0,92	0,80
	REL_2	The way IKEA takes care of you as a customer?	0,95		
	REL_3	The way IKEA communicates with you?	0,83		
Servicescape Innovation	SCA_1	The appearance of IKEA's web page or interiors?	0,88	0,93	0,81
	SCA_2	The design of physical surroundings or digital solutions?	0,89		
	SCA_3	The visual appeal of IKEA's facilities?	0,93		
Customer Loyalty	LOY_1	How likely is it that you will continue being a customer of IKEA?	0,82	0,92	0,78
	LOY_2	How likely is it that you will recommend IKEA to someone who seeks your advice?	0,93		
	LOY_3	How likely is it that you say positive things about IKEA to other people?	0,91		

By testing our constructs for discriminant validity, we are analysing to which degree each of them is distinct from the other constructs (Hair et al., 2010). The constructs were formed by building the means of the respective items. The discriminant validity can be assessed by comparing the AVE square root and the interconstruct correlations (Wixom & Todd, 2005). Adequate discriminant validity exists when the AVE square root exceeds the interconstruct correlations (Wixom & Todd, 2005). This condition is satisfied for each of our five constructs, as shown in Table 6, indicating acceptable discriminant validity. The values on the diagonal

show the AVE square roots, while the values underneath represent the respective correlations of the constructs.

Table 6: Interconstruct Correlations and AVE Square Roots

Construct	EMO	COG	REL	SCA	LOY
Emotional Satisfaction (EMO)	**0,677**				
Cognitive Satisfaction (COG)	0,246*	**0,859**			
Customer Relations Innovation (REL)	0,310**	0,195*	**0,896**		
Servicescape Innovation (SCA)	0,321**	0,177	0,806**	**0,899**	
Customer Loyalty (LOY)	0,483**	0,574**	0,163	0,194*	**0,886**

*(**. (*.) Correlation is significant at the 0,01 (0,05) level (two-tailed). Bold numbers show the AVE square root of each construct, light numbers show the inter-construct correlations.)*

We conducted the Harman's single-factor test, to address the issue of common method bias and to check whether the majority of variance in our data can be explained by a single variable (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). Since this was not the case (see Appendix I: Harman's Single-Factor Test) and based on the satisfactory results of the CFA, the final constructs were computed by calculating the means of the relevant items as can be seen in Table 7.

Table 7: Descriptive Statistics

Construct	Mean	Standard Deviation	Variance	Skewness	Kurtosis
Emotional Satisfaction (EMO)	4,121	1,130	1,276	0,198	-0,716
Cognitive Satisfaction (COG)	4,944	1,239	1,535	-0,882	0,929
Customer Relations Innovation (REL)	2,543	1,527	2,331	0,617	-0,716
Servicescape Innovation (SCA)	2,876	1,727	2,982	0,467	-1,074
Customer Loyalty (LOY)	5,844	1,280	1,638	-1,670	3,101

5.3 Results

5.3.1 SEM Results

After establishing the measurement model via the CFA, the structural model (Figure 6) was estimated with the SEM software LISREL. Firstly, we attempted to test the model with a weighted least squares estimator for ordinal data. However, as afore-mentioned, the size of the sample proved to be too small for this estimator. Therefore, we made the decision to apply the ML estimator.

The model estimates the relationship between the different types of service innovations and the perceived changes in the respective service innovation dimension. This is followed by the relationship between the perceived changes and emotional and cognitive satisfaction, and lastly, the effect of emotional and cognitive satisfaction on loyalty. Figure 6 illustrates our structural model with all significant and insignificant path coefficients, in which ServS denotes Servicescape Innovation and CustR Customer Relations Innovation. The model mirrors the result of the CFA and shows an overall acceptable fit with $\chi2 = 303,97$, $\chi2/df = 2,171$ and $p = 0,0000$. The RMSEA = 0,097 is not ideal, but still satisfactory, according to Browne and Cudeck (1993), who considers an RMSEA of < 0,1 as acceptable. Therefore, the structural model shows an overall satisfactory fit.

Figure 6: Results Structural Equation Modelling

($\chi2 = 303,97$; df = 140; P-value = 0,00000; RMSEA = 0,097)
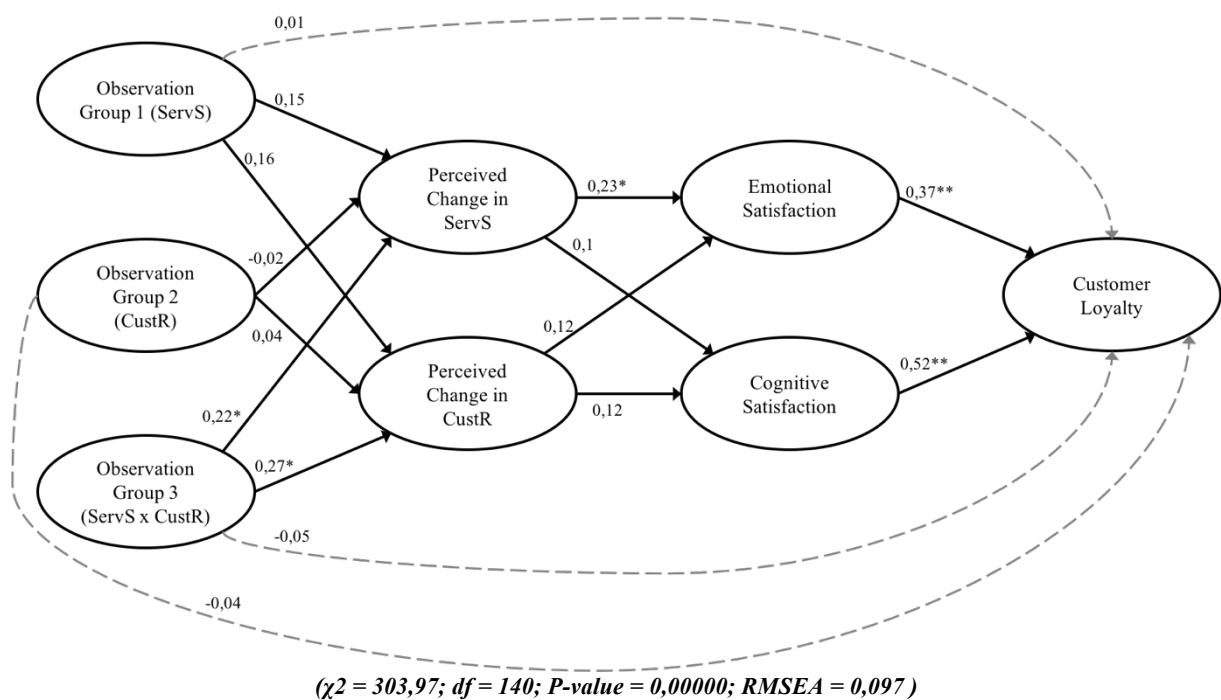
The model suggests predominantly positive relationships between the constructs, meaning that an increase in one construct will also induce an increase in the other. As can be seen in the covariance matrix in Appendix M: Covariance Matrix, all constructs have positive signs except for CustR. Moreover, some covariances are close to 0, suggesting rather weak relationships.

5.3.2 Hypothesis Testing

Taking the path analysis of coefficients of the structural model into account, we are able to test our proposed hypotheses (Hair et al., 2010).

5.3.2.1 Direct Effects

In order to test Hypothesis 1, which anticipates a positive effect from innovation on customer loyalty, we have to consider the direct effects of innovation on loyalty. Taking all three groups (customer relations innovation, servicescape innovation and both combined) into account, we find effects very close to zero (β = 0,01, *t-value* = 0,06; β = -0,04; *t-value* = -0,44 and β = -0,05; *t-value* = -0,49 respectively), but no significant relations.

Hypotheses 2 and 3 propose that an innovation in servicescape will lead to a perceived change in servicescape and customer relations. The results show a positive relationship between observation group 1 and perceived change in servicescape (β = 0,15; *t-value* = 1,38) and perceived change in customer relations (β = 0,16; *t-value* = 1,47). However, the results are not significant and therefore, H2 and H3 are not supported.

Regarding Hypotheses 4 and 5, the anticipated effect between a customer relations innovation and perceived change in servicescape and customer relations, was of a positive nature. The results however, demonstrate not only a weak relationship between observation group 2 and perceived change in customer relations (β = 0,04; *t-value* = 0,37), but also a weak and negative effect on perceived change in servicescape (β = -0,02; *t-value* = -0,20). Both coefficients are insignificant and thus, H4 and H5 are not supported either.

When it comes to observation group 3, a much stronger and significant effect from innovations on the perceived changes in servicescape (β = 0,22; *t-value* = 1,96) and customer relations (β = 0,27; *t-value* = 2,44) can be observed, indicating that H6 and H7 are supported.

As suggested by the theoretical insights, possible negative or positive effects from a perceived change in servicescape on emotional and cognitive satisfaction were predicted. Taking the effect of perceived change in servicescape on cognitive satisfaction into account, the model indicates a positive, but insignificant effect (β = 0,10; *t-value* = 1,02). Therefore, H8a and H8b are not supported. Analogously, there is a related positive and insignificant effect between perceived change in customer relations and cognitive satisfaction (β = 0,12; *t-value* = 1,22) leading to H9a and H9b also failing to be supported.

Regarding cognitive satisfaction, theory suggests both positive or negative effects from perceived change in servicescape and customer relations on emotional satisfaction. Interestingly, perceived change in servicescape leads to a positive and significant effect on

emotional satisfaction (β = 0,23; *t-value* = 1,96) supporting H10a. In parallel, this finding leads us to rejecting H10b.

The effect of perceived change in customer relations on emotional satisfaction is positive, but nonetheless insignificant (β = 0,12; *t-value* = 1,11). Hence, neither H11a or H11b are supported.

Finally, in accordance with the theory, we anticipated a positive relationship between cognitive and emotional satisfaction respectively on customer loyalty. The model shows a strong positive and significant link, whereas the one between cognitive satisfaction and loyalty is even stronger (β = 0,52; *t-value* = 5,69) than the link from emotional satisfaction (β = 0,37; *t-value* = 2,85).

An overview of all results is provided in Table 8.

5.3.2.2 Indirect Effects

An indirect or mediating effect occurs "when a third variable/construct intervenes between two other related constructs" (Hair et al., 2010, p. 766) and investigates why there is a relationship between two constructs. Importantly, there have to be significant correlations among all three variables or constructs in place for mediation to be present (Hair et al., 2010). By testing for mediation effects, we examine the role of emotional and cognitive satisfaction for the relationship between firm innovations and customer loyalty. According to Baron and Kenny (1986), four steps are necessary to establish mediation. Firstly, the causal variable (firm innovation) has to be correlated with the outcome variable (customer loyalty). Secondly, a correlation between the causal variable and the mediators (perceived changes in servicescape and customer relations and emotional and cognitive satisfaction) has to be demonstrated. Thirdly, it has to be shown that the mediator affects the outcome variable. Lastly, in order to show that the mediator is effective, the direct effect between the causal and the outcome variable should be zero.

However, we are not able to demonstrate mediating effects between any type of firm innovation and customer loyalty as all direct effects are insignificant (see also Appendix L: Indirect Effects Test Output (LISREL) and Figure 6).

Table 8: Results of Hypotheses Testing

Hypothesis	Variable Relationship	Direction	β	t-value	Support
H1	Firm Innovation -> Customer Loyalty	+	-	-	No
H2	ServS Innovation -> Perceived Change in ServS	+	0,15	1,38	No
H3	ServS Innovation -> Perceived Change in CustR	+	0,16	1,47	No
H4	CustR Innovation -> Perceived Change in ServS	+	-0,02	-0,2	No
H5	CustR Innovation -> Perceived Change in CustR	+	0,04	-0,37	No
H6	ServS + CustR Innovation -> Higher Perceived Change in ServS	+	0,22	1,96	Yes
H7	ServS + CustR Innovation -> Higher Perceived Change in CustR	+	0,27	2,44	Yes
H8a	Perceived Change in ServS -> Cognitive Satisfaction	+	0,10	1,02	No
H8b	Perceived Change in ServS -> Cognitive Satisfaction	-	0,10	1,02	No
H9a	Perceived Change in CustR -> Cognitive Satisfaction	+	0,12	1,22	No
H9b	Perceived Change in CustR -> Cognitive Satisfaction	-	0,12	1,22	No
H10a	Perceived Change in ServS -> Emotional Satisfaction	+	0,23	1,96	Yes
H10b	Perceived Change in ServS -> Emotional Satisfaction	-	0,23	1,96	No
H11a	Perceived Change in CustR -> Emotional Satisfaction	+	0,12	1,11	No
H11b	Perceived Change in CustR -> Emotional Satisfaction	-	0,12	1,11	No
H12, H13	Cognitive Satisfaction -> Customer Loyalty	+	0,52	5,69	Yes
H14, H15	Emotional Satisfaction -> Customer Loyalty	+	0,37	2,85	Yes

6 Discussion, Implications, Limitations and Conclusion

The following chapter will discuss the results of the tested hypotheses in chapter 5.3.2. Subsequently, we will derive both theoretical and practical implications from our discussion. Moreover, crucial limitations affecting the study and directions for future research will be pointed out before concluding the study.

6.1 Discussion

All in all, 14 out of 19 hypotheses were not supported due to insignificant effects. With this in mind, we refer back to our research question:

> "Do innovations in a firm's servicescape and customer relations affect the customer loyalty mediated by the customer's emotional and cognitive satisfaction, and if so, how?"

The answer is: to some extent. Overall, we did not gather evidence for an immediate effect from customer relations and servicescape innovation on customer loyalty via emotional and cognitive satisfaction. Nonetheless, the combination of both innovation dimensions evoked a positive and significant effect on perceived changes in customer relations and servicescape.

As aforementioned, the effects in observation group 1 and 2 on perceived change in customer relations and servicescape respectively, were not significant. A possible reason could lie in the weakness of the chosen innovation cases which might not have portrayed the respective innovation dimensions adequately or strong enough. Notably however, the effect between observation group 3 and both perceived innovation changes have been significant and much stronger than for observation groups 1 and 2, which did not yield significant results. Assumingly due to the stronger presence of innovation, the effect on overall perceived change was not only substantially stronger than in the single cases, it was also significant. Nonetheless, we were not able to confirm the model of service innovation perception dimensions proposed by Lervik-Olsen et al. (2016) regarding customer relations and servicescape innovation.

Furthermore, the links between perceived change in servicescape and customer relations innovations and emotional and cognitive satisfaction were only partly significant. According to the model, only the effect of perceived change in servicescape on emotional satisfaction is significant. Therefore, it is implied that the perception of innovations is not affecting cognitive

satisfaction. In other words, we were not able to gather evidence that customers consciously evaluate and cognitively process their satisfaction on a perceived service change.

The study replicates two main findings from the theory regarding customer loyalty. Firstly, both cognitive and emotional satisfaction have significant positive effects on customer loyalty. Therefore, the notion of emotional satisfaction as an independent contributor to loyalty is supported. Secondly, we find in accordance with Lervik-Olsen et al. (2016), that the cognitive satisfaction channel has a stronger effect (almost twice as strong as emotional satisfaction) on loyalty.

This study has been able to provide interesting insights on the customer's innovation perception process. According to the results, customers engage in emotional reactions when confronted with service innovation which addresses multiple areas of perception. This finding suggests that customer-perceived innovations, which concern several perception dimensions, taps into emotional satisfaction and has an impact on the latter. Moreover, as aforementioned, it is specifically the case of a multiple dimension innovation which evokes this reaction. Thus, customers do not recognize small innovations, but only more comprehensive innovations are perceived and processed. It follows that extensive innovations bear a higher change to have a positive impact on customer loyalty. Therefore, it is debatable what this finding implies for service innovation research. Witnessing a greatly innovated customer experience, may stimulate the customers' emotions and possibly evoke a feeling of excitement and happiness if service expectations are exceeded in the context of disconfirmation (Oliver, Rust & Varki, 1997).

All in all, the results suggest that firms are better off, if they focus on innovation addressing several perception-dimensions while promoting emotional satisfaction. This implication can also be taken into account for the realm of business model innovation. Business model innovation, which has recently gained a lot of attention as a research field (Zott, Amit & Massa, 2011), concerns the innovation of the value creation, capture and delivery of a firm (Teece, 2010). Our study suggests the notion that innovating entire business models can have positive effects on customer retention, as these innovations mostly cover various areas of the respective business. Hence, the perceived change on the customer is expected to be rather strong and thus, enhancing the customer's loyalty.

6.2 Theoretical Implications

This study has the goal to investigate the perception of service innovation by customers and its effects on customer satisfaction and loyalty.

Zolfagharian and Paswan (2008) find that customers are able to discern innovations in different service elements. Nonetheless, we were not able to replicate this finding with the model of perception dimensions of service innovation by Lervik-Olsen et. al (2016), as the treatment groups manipulated in terms with servicescape and customer relations innovations did not yield any significant effects on neither cognitive nor emotional satisfaction. As there has been no research so far which has investigated servicescape and customer relations and their interplay specifically, we are not able to draw any deductions by a comparison with other studies.

The insights from our pre-test and experiment illustrate the difficulty of portraying the different areas of service innovation adequately and that they are not entirely independent from each other.

Due to the insignificance of the results, we are able to contribute to the ongoing discussion on the role of customer perception of service innovation, but did not generate substantial breakthroughs. Therefore, we cannot argue that a perceived change in an innovation perception dimension is linked to loyalty.

It has become evident, however, that emotional satisfaction functions as an independent contributor not only with regards to service quality as shown by Wong (2004), but also when it comes to service innovation.

6.3 Managerial Implications

The main aim has been to illustrate the relevance of customer perception within service innovation and to expand the knowledge on how customers perceive innovations in service encounters and how these can be applied in order to foster loyalty.

As mentioned earlier, we were not able to draw conclusions about the separate effects of customer relations and servicescape innovations. However, both interventions combined created a significant effect on loyalty. This finding implies that strong innovations which cover several perception areas have positive effects on satisfaction and loyalty.

Nonetheless, despite the range of insignificant results, we were able to provide new perspectives on the area of service innovation perception. Even if we did not receive positive results regarding the relationship of service innovation, perceived changes and satisfaction, we were able to further explore the links between satisfaction and customer loyalty. Correspondingly, service innovators and practitioners are recommended to take the effects of the respective innovation on both emotional and cognitive satisfaction into account. Ideally, in order to foster customer loyalty both types of satisfaction should be addressed and fulfilled. Still, we find that the effect of cognitive satisfaction on loyalty is greater than of emotional which should be considered by practitioners.

Therefore, this study highlights the need to bear the customer's perspective for prospective service innovation in mind. Due to the largely insignificant results, we assume that this study will have only limited effect for managers and firms regarding their service innovation processes. Yet, we hope to draw managers' attention to the relevance of customer-centric innovation and to take the findings into consideration when creating new service experiences by service innovation. If done correctly, service innovation can foster customer loyalty and ultimately firm performance.

6.4 Limitations and Future Research

Most research studies are affected by limitations. The discussion of the limitations is a crucial part of a research study since they allow to determine starting points for future research, which will be discussed afterwards (de Ruyter et al., 2000).

6.4.1 Limitations

Evidently, the study's results proved not to be ideal. Nevertheless, we provide directions for future research by recognizing its limitations.

With regards to our research model, the results could have been enhanced by including all four discussed service dimension areas (core service, service delivery, customer relations and servicescape) in our model. However, due to limited resources, we had to focus on selected factors.

The reliability of the study is affected by the choice of applying convenience sampling as this technique can lead to biases and external influences (Saunders et al., 2016). The choice of only targeting business students also affects the reliability, since the results may not be fully

generalizable (Zikmund, Barbin, Carr & Griffin, 2010). Furthermore, we are also aware that our sample size was rather small (N=124), with a minimum threshold of 30 respondents per group, as many careless responses had to be eliminated (N=61). Therefore, a replication of the study with a broader and larger sample, may provide different and deeper insights.

The experiment was conducted via an online survey. Therefore, we did not have any influence on external factors or possible distractions which may have influenced the carefulness of the answering. An experiment in lab conditions, which was not feasible due to resource restrictions, can prevent these distortions.

Furthermore, there is a potential danger that the depiction of the service innovation dimensions in the experiment cases was not strong enough, despite the positive result of the pre-test. Moreover, we received feedback from participants that they were not entirely sure about the relevance of their answer, as they had not been to IKEA in a while. Due to the provision of the cases for the base of the experiment, the background knowledge on IKEA was not very relevant for their provided answers. Nonetheless, respondents may have been very uncertain about their answers, which might potentially have impacted the quality of the responses. A replication of the study with another case firm may also shed light on different aspects, as respondents have different personal relations with different firms.

Moreover, we also take the impact of different personal understandings into account. As the experiment aimed at avoiding to prime participants on innovation, the concept of innovation has not been mentioned or explained. Individuals may have considerably different perceptions and definitions on innovation which we could consequently not control for in the experiment.

Regarding the data analysis, we faced issues based on the small sample size. Due to this shortcoming, we were not able to run the analysis for ordinals in LISREL. Instead, we chose to apply the ML estimator with a covariance matrix. Additionally, we continued the data analysis with our initially proposed model. Due to resource constraints, we did not open up for different relationships, which could have exhibited a better model fit.

Taking the insignificant effects into account, it is important to raise the question what these could have been caused by. Most insignificances originate from the construct of perceived change caused by the innovations. First of all, we would like to scrutinise the experiment format. The cases were presented in written form, whereas innovations in real life settings are mainly perceived sensually. Therefore, an improved illustration of the innovation

manipulations, e.g. by video or an actual presentation of the innovation, may yield different effects. Moreover, one could argue that the presented manipulations were not strong enough or did not correspond to the innovation perception they were intended to portray. As aforementioned, many innovations involve changes in one or more perception dimensions. Possibly, our cases did not differentiate the relevant dimensions effectively enough. This assumption is supported by the positive, significant result of observation group 3. Case 3 included an extended text as well as more pictures which might have been more engaging.

6.4.2   Future Research

Concerning service innovation, the dimensions of satisfaction and the role of emotions, and the effect on customer loyalty, we see a large potential as well as a need for future research. In the following chapter, we will discuss how research on these topics can be taken further considering our theory development, the research design and the results of our research.

As mentioned before, our research focused on only two of the four proposed dimensions of service innovation. By extending the research model, all factors could be covered, and the respective effects on customer loyalty studied. Additionally, the constructs of customer relations and servicescape could be discussed further as well.

In terms of research methodology, we designed the study to bear reliable and valid results, yet we see potential for future research to strengthen the reliability of the data and the results. To do so, a larger and broader sample could be taken to allow for stronger generalisability as well as to open up for more detailed statistical tests. Regarding the research setting, the innovations could be presented in a different way. Instead of a mainly text-based online format, the effects of the innovations might be significantly stronger, if they are presented in a lab-based live format where participants can experience the service innovations in reality. Additionally, a different or even multiple case companies could be taken to run the experiment. This would allow to test for differences in between companies as well.

Considering the different dimensions of service innovations and the fact that innovations are often not clearly assignable to just one of these dimensions, future research could discuss the relatedness of theses dimensions further. For instance, there might be distinguishable intersections between the four dimensions.

All in all, there remains a need to examine consumers' innovation perception. Therefore, future research can address all shortcomings of our study and find new paths for further research.

6.5 Conclusion

This study has the goal to examine the way customers perceive service innovation and whether or how this perception effects customer loyalty with the mediators cognitive and emotional satisfaction. Thereby, we aim to fill a prevalent gap within the field of innovation-research from a customer perspective.

In order to answer the posed research question, an experiment has been conducted. Eventually, several of the posed hypotheses were not supported due to insignificance. The single innovation dimensions servicescape and customer relations did not trigger significant perceived changes. Moreover, significant effects between perceived changes in the respective innovation area and the two satisfaction types only occurred between perceived change in servicescape and emotional satisfaction. Nevertheless, interestingly, we find significant links between the combined innovation cases and perceived changes in both areas. This finding suggests that stronger or multiple innovations can have a stronger impact on perceived changes and ultimately loyalty via emotional satisfaction. Moreover, we confirm that both emotional and cognitive satisfaction relate to loyalty mirroring the finding of previous studies.

However, we identify a need for further research in order to get a full understanding of the underlying processes and connections when it comes to customer's perception of service innovation in order to understand the interaction with customer loyalty.

Conclusively, we want to highlight that innovations can only succeed if customers accept and adapt them. Therefore, service innovators need to take the customers' perception of the innovation into account. All in all, despite largely insignificant results, this thesis has contributed and followed the call to a focus on customer-centric service innovation and sheds light on how service innovation can be applied in order to foster customer loyalty by creating satisfying service experiences.

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Appendix

Appendix A: Pre-Test

Introduction for the Pre-Tests

This survey is part of a master thesis at the Norwegian School of Economics and focuses on customers' perceptions of firms' activities.

Kindly review this short introduction of the topic before beginning the survey.

Innovation describes the implementation of a new or significantly improved service, product or process. One can distinguish between four different sub-categories within service innovation: core service, service delivery, servicescape and customer relations.

Taking a café as an example, its core service is to offer food and drinks and its service delivery is about how food and beverages are made and served. The servicescape of the café refers to the physical and digital facilities, like the interior design or the website, while customer relations concern the methods of how the café establishes and maintains its relationship with customers, e.g. through loyalty programs.

We have chosen to study IKEA. The firm, one of the world's largest retailers, is mainly known for its ready-to-assemble products and selling typically Swedish food.

Please read the information carefully and fill in the following questionnaire conscientiously. Please respond to each question. If you are unsure, pick the answer most likely to your mindset.

No personal data is collected. Participants remain anonymous. It takes about five minutes to participate in the survey.

Many thanks!

Short Cases

I. IKEA has managed to establish itself as a major player in the global retailing landscape. Its target is to become the world's leading multi-channel home furnishing retailer. The Sweden-based retailer has grown considerably over the last few years and plans to continue this trend. IKEA recorded over 900 million store visits in their financial year 2016 and currently employs over 180.000 people worldwide.

The firm offers a broad product range at an affordable price. Customers can find many products from furniture and kitchens to toys and home accessories. IKEA's philosophy is to bring Scandinavian spirit to homes around the globe.

II. The IKEA catalogue offers customers a complete overview of the firm's product range. Customers can find products ranging from desk lamps over kitchen furniture to entire living rooms. Recently, the company launched a free VR-application for smartphones and tablets, in addition to the existing print catalogue. Customers can choose products from the catalogue and by using the device's camera they can get a virtual impression on screen of how the product will fit into their home.

III. IKEA FAMILY is a free customer loyalty program which includes a large range of benefits. Members of the program receive discounts at the firm's restaurant and on special products, free coffee, and access to exclusive lotteries and events. Recently, the company launched two new benefits for members: free transport insurance for members who purchased furniture and trips to the company's homeland, Sweden, at special member rates.

Long Cases

I. IKEA has managed to establish itself as a major player in the global retailing landscape. Its target is to become the world's leading multi-channel home furnishing retailer. The Sweden-based retailer has grown considerably over the last few years and plans to continue this trend. IKEA recorded over 900 million store visits in their financial year 2016 and currently employs over 180.000 people worldwide.

The firm offers a broad product range at an affordable price. Customers can find many products from furniture and kitchens to toys and home accessories. IKEA's philosophy is to bring Scandinavian spirit to homes around the globe.

II. The IKEA catalogue offers customers a complete overview of the firm's product range. Customers can use the catalogue to find any type of furniture or accessories that might be needed from IKEA.

Recently, the company moved forward and launched a more technologically advanced augmented reality catalogue in the form of a tablet application. The system allows customers, via their tablet's cameras and sensors, to put IKEA furniture digitally into their room. Customers can now browse the catalogue, pick a product they like, and easily find out whether it fits into their room and what it is going to look like.

III. The launch of IKEA FAMILY introduced several zero cost benefits to customers. Members of IKEA FAMILY have access to reduced prices on many products and are the first to be informed about new products coming to the store. In the IKEA restaurant, members get discounts and enjoy free coffee. Additionally, members have access to exclusive lotteries and events.

Recently, the company launched two new valuable benefits for all IKEA FAMILY members: free transport insurance for purchased furniture and trips to the company's homeland, Sweden, at special member rates.

Questionnaire for all cases

To what extent does this text describe an innovation in core service?

Not at all   Somewhat   To great extent

o   o   o   o   o   o   o

To what extent does this text describe an innovation in service delivery?

Not at all   Somewhat   To great extent

o   o   o   o   o   o   o

To what extent does this text describe an innovation in servicescape?

Not at all   Somewhat   To great extent

o   o   o   o   o   o   o

To what extent does this text describe an innovation in customer relations?

Not at all   Somewhat   To great extent

o   o   o   o   o   o   o

Appendix B: Experiment Introduction and Cases

1. Introduction for all Treatment Groups

This survey is part of a master's thesis at the Norwegian School of Economics and is about customers' perceptions of firms' activities.

For the purpose of this study, we have chosen IKEA, one of the world's largest furniture retailers, as a case company. The firm is mainly known for its ready-to-assemble products and the offering of typically Swedish food.

Please read the information carefully and fill in the following questionnaire conscientiously. Please respond to each question. In case of uncertainty pick the answer most likely to your mindset. It takes about 7 minutes to participate in the survey.

On the next page you will find a text which is followed by some questions. To take part in the raffle to win 1 of the 5 Amazon.com vouchers (50,-€), you can submit your e-mail address at the end of the survey. Regardless of your participation in the raffle, your answers will remain anonymous and no personal data will be collected.

Many thanks!

2. Servicescape Innovation Case

IKEA has managed to establish itself as a major player in the global retailing landscape. Its target is to become the world's leading multi-channel home furnishing retailer. The Sweden-based retailer has grown considerably over the last few years and plans to continue this trend. IKEA recorded over 900 million store visits in their financial year 2016 and currently employs over 180.000 people worldwide.

The firm offers a broad product range at an affordable price. Customers can find many products from furniture and kitchens to toys and home accessories. IKEA's philosophy i to bring Scandinavian spirit to homes around the globe.

The IKEA catalogue offers customers a complete overview of the firm's product range. Customers can find products ranging from desk lamps over kitchen furniture to entire living rooms. Recently, the company launched a free VR-application for smartphones and tablets, in addition to the existing print catalogue. Customers can choose products from the catalogue and by using the device's camera they can get a virtual impression on screen of how the product will fit into their home.

3. Customer Relations Innovation Case

IKEA has managed to establish itself as a major player in the global retailing landscape. Its target is to become the world's leading multi-channel home furnishing retailer. The Sweden-based retailer has grown considerably over the last few years and plans to continue this trend. IKEA recorded over 900 million store visits in their financial year 2016 and currently employs over 180.000 people worldwide.

The firm offers a broad product range at an affordable price. Customers can find many products from furniture and kitchens to toys and home accessories. IKEA's philosophy is to bring Scandinavian spirit to homes around the globe.

IKEA FAMILY is a free customer loyalty program which includes a large range of benefits. Members of the program receive discounts at the firm's restaurant and on special products, free coffee, and access to exclusive lotteries and events. Recently, the company launched two new benefits for members: free transport insurance for members who purchased furniture and trips to the company's homeland, Sweden, at special member rates.

4. Servicescape and Customer Relations Case

IKEA has managed to establish itself as a major player in the global retailing landscape. Its target is to become the world's leading multi-channel home furnishing retailer. The Sweden-based retailer has grown considerably over the last few years and plans to continue this trend. IKEA recorded over 900 million store visits in their financial year 2016 and currently employs over 180.000 people worldwide.

The firm offers a broad product range at an affordable price. Customers can find many products from furniture and kitchens to toys and home accessories. IKEA's philosophy is to bring Scandinavian spirit to homes around the globe.

The IKEA catalogue offers customers a complete overview of the firm's product range. Customers can find products ranging from desk lamps over kitchen furniture to entire living rooms. Recently, the company launched a free VR-application for smartphones and tablets, in addition to the existing print catalogue. Customers can choose products from the catalogue and by using the device's camera they can get a virtual impression on screen of how the product will fit into their home.

IKEA FAMILY is a free customer loyalty program which includes a large range of benefits. Members of the program receive discounts at the firm's restaurant and on special products, free coffee, and access to exclusive lotteries and events. Recently, the company launched two new benefits for members: free transport insurance for members who purchased furniture and trips to the company's homeland, Sweden, at special member rates.

Appendix C: Adapted Measures with Sources

Construct	Source
Change in Core Service	Lervik-Olsen et al. (2016)
	Think about IKEA's market offerings. During the last months, to what extent has there been a change in • How IKEA's offerings match your wants? • How IKEA's offerings meet your needs? • IKEA's overall market offering?
Change in Service Delivery	Lervik-Olsen et al. (2016)
	Think about your experience with getting what IKEA offers. During the last months, to what extent has there been a change in • The way IKEA delivers what it offers? • How easy it is to make use of IKEA's offerings? • How fast IKEA delivers what it offers? • Your efforts when making use of IKEA's offerings?
Change in Servicescape	Lervik-Olsen et al. (2016)
	Think about your experience with IKEA's physical and digital facilities. During the last months, to what extent has there been a change in • The appearance of IKEA's web page or interiors? • The design of physical surroundings or digital solution? • The visual appeal of IKEA's facilities?
Change in Customer Relations	Lervik-Olsen et al. (2016)
	Think about your experience with how IKEA takes care of their customers. During the last months, to what extent has there been a change in • The way IKEA treats you as a customer? • The way IKEA takes care of you as a customer? • The way IKEA communicates with you?
Emotional Satisfaction	Russell and Mehrabian (1977)
	Please describe your emotions when you use IKEA's products and services: • I become… Unaroused / Aroused • I become… Relaxed / Stimulated • I become… Calm / Excited
Cognitive Satisfaction	Russell and Mehrabian (1977)
	Please describe your emotions when you use IKEA's products and services: • I become… Disappointed / Contented • I become… Unhappy / Happy • I become… Annoyed / Pleased • I become... Unsatisfied / Satisfied

Perceived Innovativeness	Kunz et al. (2011)
	• IKEA changes the market with its offers • IKEA is a very creative company • IKEA is a pioneer in its category • IKEA is an innovative company
Relative Attractiveness	Andreassen & Lervik (1999)
	• Does IKEA have better prices than other similar companies? • Does IKEA provide products and services of better quality, compared to other companies? • Does IKEA have better reputation than other similar companies? • Is IKEA more attractive than other similar companies?
Customer Loyalty	Cronin et al. (2000)
	• How likely or unlikely is it that you will continue being a customer of IKEA? • How likely or unlikely is that you will recommend IKEA to someone who seeks your advice? • How likely or unlikely is that you say positive things about IKEA to other people?

Appendix D: Survey Questionnaire

Please describe your emotions when you use IKEA's products and services. I become...

Unaroused	○	○	○	○	○	○	○	Aroused
Relaxed	○	○	○	○	○	○	○	Stimulated
Disappointed	○	○	○	○	○	○	○	Contented
Calm	○	○	○	○	○	○	○	Excited
Unhappy	○	○	○	○	○	○	○	Happy
Annoyed	○	○	○	○	○	○	○	Pleased
Unsatisfied	○	○	○	○	○	○	○	Satisfied

Think about IKEA's market offerings. During the last months, to what extent has there been a change in

	1 - not at all	2	3	4 - to a moderate extent	5	6	7 - to a very great extent
How IKEA's offerings match your wants?	○	○	○	○	○	○	○
How IKEA's offerings meet your needs?	○	○	○	○	○	○	○
In IKEA's overall market offering?	○	○	○	○	○	○	○

Think about your experience with receiving what IKEA offers. During the last months, to what extent has there been a change in

	1 - not at all	2	3	4 - to a moderate extent	5	6	7 - to a very great extent
The way IKEA delivers what it offers?	○	○	○	○	○	○	○
How easy it is to make use of IKEA's offerings?	○	○	○	○	○	○	○
How fast IKEA delivers what it offers?	○	○	○	○	○	○	○
Your efforts when making use of IKEA's offerings?	○	○	○	○	○	○	○

Think about your experience with how IKEA takes care of their customers. During the last months, to what extent has there been a change in

	1 - not at all	2	3	4 - to a moderate extent	5	6	7 - to a very great extent
The way IKEA treats you as a customer?	○	○	○	○	○	○	○
The way IKEA takes care of you as a customer?	○	○	○	○	○	○	○
The way IKEA communicates with you?	○	○	○	○	○	○	○

Think about your experience with IKEA's physical and digital facilities. During the last months, to what extent has there been a change in

	1 - not at all	2	3	4 - to a moderate extent	5	6	7 - to a very great extent
The appearance of IKEA's web page or interiors?	○	○	○	○	○	○	○
The design of physical surroundings or digital solutions?	○	○	○	○	○	○	○
The visual appeal of IKEA's facilities?	○	○	○	○	○	○	○

To what extent do you agree or disagree with the following statements?

	1 - Strongly Disagree	2	3	4 - Neither Agree nor Disagree	5	6	7 - Strongly Agree
IKEA changes the market with its offers.	○	○	○	○	○	○	○
IKEA is a very creative company.	○	○	○	○	○	○	○
IKEA is a pioneer in its category.	○	○	○	○	○	○	○
IKEA is an innovative company.	○	○	○	○	○	○	○

Please answer the questions below.

	1 - Very Unlikely	2	3	4 - Undecided	5	6	7 - Very Likely
How likely is it that you will continue being a customer of IKEA?	○	○	○	○	○	○	○
How likely is that you will recommend IKEA to someone who seeks your advice?	○	○	○	○	○	○	○
How likely is that you say positive things about IKEA to other people?	○	○	○	○	○	○	○

Please compare IKEA with other companies that offer similar products and services. To what extent

	1 - not at all	2	3	4 - to a moderate extent	5	6	7 - to a very great extent
Does IKEA have better prices than other similar companies?	○	○	○	○	○	○	○
Does IKEA provide products and services of better quality, compared to other companies?	○	○	○	○	○	○	○
Does IKEA have better reputation than other similar companies?	○	○	○	○	○	○	○
Is IKEA more attractive than other similar companies?	○	○	○	○	○	○	○

Please indicate your age:

○ <18 years

○ 18 to 24 years

○ 25 to 34 years

○ 35 to 44 years

○ 45 to 54 years

○ 55 to 64 years

○ Age 65 or older

What is your gender?

○ Male

○ Female

○ Wish to not disclose

What is you highest education level?

○ Primary school

○ Secondary school

○ University/ college ≤ 3 years

○ University/ college > 3 years

Thank you for taking the time to answer this survey. Your response has been recorded.

The MSc students Paul Schulte-Brüggemann and Yvonne Streit from Norwegian School of Economics are entirely responsible for the content of this questionnaire. The survey is conducted solely for academic purposes as a part of their master's thesis. The IKEA Group has no connection to the survey.

Do you want to take part in the raffle for 1 of 5 Amazon.com vouchers (50,- €)? The information will be stored separately from your previous responses.

○ Yes

○ No

Appendix E: Normality Test

	Tests of Normality					
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Core_Service	0,129	124	0,000	0,931	124	0,000
Delivery	0,161	124	0,000	0,890	124	0,000
Customer_Relations	0,191	124	0,000	0,877	124	0,000
Servicescape	0,162	124	0,000	0,891	124	0,000
Loyalty	0,186	124	0,000	0,817	124	0,000
Emotional_Satisfaction	0,108	124	0,001	0,978	124	0,044
Cognitive_Satisfaction	0,101	124	0,004	0,945	124	0,000
a. Lilliefors Significance Correction						

Appendix F: Descriptive Statistics

Construct	Item	Mean	Standard Deviation	Variance	Skewness	Kurtosis
Emotional Satisfaction	EMO_1	4,056	1,494	2,233	-0,469	-0,176
	EMO_2	4,065	1,407	1,980	0,115	-0,722
	EMO_3	4,242	1,478	2,185	-0,012	-0,704
Cognitive Satisfaction	COG_1	4,831	1,366	1,865	-0,934	0,572
	COG_2	4,992	1,253	1,569	-0,842	1,400
	COG_3	4,847	1,465	2,147	-0,770	0,174
	COG_4	5,105	1,442	2,078	-0,947	0,530
Customer Relations Innovation	REL_1	2,444	1,679	2,818	0,823	-0,510
	REL_2	2,548	1,669	2,786	0,660	-0,894
	REL_3	2,637	1,589	2,526	0,431	-1,005
Servicescape Innovation	SCA_1	2,798	1,848	3,414	0,592	-0,999
	SCA_2	2,960	1,867	3,486	0,448	-1,093
	SCA_3	2,871	1,830	3,349	0,485	-1,006
Customer Loyalty	LOY_1	6,145	1,311	1,719	-2,166	5,255
	LOY_2	5,790	1,439	2,069	-1,556	2,256
	LOY_3	5,597	1,402	1,966	-1,173	1,067

Appendix G: CFA – Model Fit Output

MODEL FIT INFORMATION

Number of Free Parameters   58

Loglikelihood
        H0 Value   -2907.897
        H1 Value   -2827.648

Information Criteria
        Akaike (AIC)   5931.794
        Bayesian (BIC)   6095.370
        Sample-Size Adjusted BIC   5911.971
          $(n^* = (n + 2) / 24)$

Chi-Square Test of Model Fit
        Value   160.498
        Degrees of Freedom   94
        P-Value   0.0000

RMSEA (Root Mean Square Error Of Approximation)
        Estimate   0.076
        90 Percent C.I.   0.055   0.095
        Probability RMSEA <= .05   0.022

CFI/TLI
        CFI   0.956
        TLI   0.944

Chi-Square Test of Model Fit for the Baseline Model
        Value   1627.382
        Degrees of Freedom   120
        P-Value   0.0000

SRMR (Standardized Root Mean Square Residual)
        Value   0.068

Appendix H: CFA – Standardised Model Results

STANDARDIZED MODEL RESULTS

STDYX Standardization

	Estimate	S.E.	Est./S.E.	Two-Tailed P-Value
EMO BY				
EMO_1	0.397	0.093	4.258	0.000
EMO_2	0.727	0.068	10.627	0.000
EMO_3	0.829	0.069	12.060	0.000
COG BY				
COG_1	0.851	0.030	28.282	0.000
COG_2	0.834	0.032	25.768	0.000
COG_3	0.863	0.029	30.023	0.000
COG_4	0.887	0.026	34.549	0.000
REL BY				
REL_1	0.906	0.020	44.509	0.000
REL_2	0.952	0.016	60.128	0.000
REL_3	0.825	0.032	25.823	0.000
SCAPE BY				
SCAPE_1	0.882	0.025	35.949	0.000
SCAPE_2	0.887	0.024	36.839	0.000
SCAPE_3	0.928	0.019	48.541	0.000
LOY BY				
LOY_1	0.816	0.034	23.798	0.000
LOY_2	0.926	0.021	43.144	0.000
LOY_3	0.911	0.023	39.753	0.000
COG WITH				
EMO	0.246	0.103	2.382	0.017
REL WITH				
EMO	0.310	0.100	3.116	0.002
COG	0.195	0.093	2.095	0.036

SCAPE WITH

EMO	0.321	0.097	3.311	0.001
COG	0.177	0.095	1.872	0.061
REL	0.806	0.039	20.595	0.000

LOY WITH

EMO	0.483	0.087	5.562	0.000
COG	0.574	0.069	8.357	0.000
REL	0.163	0.094	1.739	0.082
SCAPE	0.194	0.093	2.079	0.038

SCAPE WITH

EMO	0.321	0.097	3.311	0.001
COG	0.177	0.095	1.872	0.061
REL	0.806	0.039	20.595	0.000

Appendix I: Harman's Single-Factor Test

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,968	37,298	37,298	5,968	37,298	37,298
2	3,624	22,649	59,946			
3	1,711	10,692	70,639			
4	1,132	7,074	77,713			
5	0,720	4,503	82,215			
6	0,610	3,814	86,029			
7	0,456	2,849	88,878			
8	0,315	1,966	90,844			
9	0,276	1,725	92,569			
10	0,253	1,581	94,149			
11	0,223	1,392	95,541			
12	0,187	1,171	96,712			
13	0,174	1,088	97,800			
14	0,148	0,926	98,727			
15	0,119	0,746	99,473			
16	0,084	0,527	100,000			

Extraction Method: Principal Component Analysis.

Appendix K: SEM Output (LISREL)

	VAR 11	VAR 12	VAR 13	VAR 14	VAR 15	VAR 16
VAR 11	2.818					
VAR 12	2.438	2.786				
VAR 13	1.894	2.095	2.526			
VAR 14	1.895	1.957	2.007	3.414		
VAR 15	1.986	2.095	1.953	2.732	3.486	
VAR 16	2.220	2.120	1.969	2.771	2.792	3.349
VAR 4	0.463	0.595	0.435	0.345	0.474	0.422
VAR 5	0.638	0.509	0.471	0.338	0.499	0.504
VAR 7	0.672	0.460	0.341	0.594	0.709	0.739
VAR 6	0.409	0.419	0.304	0.372	0.221	0.263
VAR 8	0.337	0.273	0.314	0.356	0.300	0.227
VAR 9	0.402	0.434	0.415	0.603	0.628	0.500
VAR 10	0.246	0.308	0.469	0.347	0.321	0.249
VAR 17	0.203	0.196	0.313	0.338	0.437	0.255
VAR 18	0.386	0.327	0.273	0.470	0.382	0.395
VAR 19	0.392	0.312	0.332	0.487	0.520	0.378
VAR 1	-0.002	0.044	0.054	0.036	0.084	0.066
VAR 2	-0.035	-0.069	-0.107	-0.097	-0.128	-0.082
VAR 3	0.136	0.143	0.089	0.122	0.156	0.105

Covariance Matrix

	VAR 4	VAR 5	VAR 7	VAR 6	VAR 8	VAR 9
VAR 4	2.233					
VAR 5	0.663	1.980				
VAR 7	0.604	1.277	2.185			
VAR 6	0.815	0.011	0.375	1.865		
VAR 8	0.732	0.090	0.417	1.210	1.569	
VAR 9	0.895	0.042	0.460	1.510	1.316	2.147
VAR 10	0.709	0.099	0.357	1.473	1.359	1.585
VAR 17	0.650	0.356	0.469	0.626	0.676	0.835
VAR 18	0.687	0.550	0.913	0.728	0.681	0.886
VAR 19	0.657	0.425	0.798	0.866	0.704	1.043
VAR 1	0.115	0.065	0.083	-0.013	0.010	0.097
VAR 2	-0.054	-0.073	-0.075	-0.048	-0.022	-0.093
VAR 3	0.043	-0.016	-0.018	0.066	0.043	0.062

Covariance Matrix

	VAR 10	VAR 17	VAR 18	VAR 19	VAR 1	VAR 2
VAR 10	2.078					
VAR 17	1.042	1.719				
VAR 18	1.006	1.437	2.070			
VAR 19	1.051	1.352	1.703	1.966		
VAR 1	0.005	0.027	0.071	0.056	0.193	
VAR 2	-0.066	-0.076	-0.063	-0.072	-0.063	0.185
VAR 3	0.105	0.087	-0.014	0.009	-0.063	-0.059

Covariance Matrix

	VAR 3
VAR 3	0.185

Total Variance = 38.754 Generalized Variance = 0.00368

Largest Eigenvalue = 15.707 Smallest Eigenvalue = 0.056

Condition Number = 16.820

DA NO=124 NI=19 MA=CM

Parameter Specifications

LAMBDA-Y

	Rel	Scape	Emot	Cogn	Loyal

```
              --------  --------  --------  --------  --------
   VAR 11            0         0         0         0         0
   VAR 12            1         0         0         0         0
   VAR 13            2         0         0         0         0
   VAR 14            0         0         0         0         0
   VAR 15            0         3         0         0         0
   VAR 16            0         4         0         0         0
   VAR 4             0         0         0         0         0
   VAR 5             0         0         5         0         0
   VAR 7             0         0         6         0         0
   VAR 6             0         0         0         0         0
   VAR 8             0         0         0         7         0
   VAR 9             0         0         0         8         0
   VAR 10            0         0         0         9         0
   VAR 17            0         0         0         0         0
   VAR 18            0         0         0         0        10
   VAR 19            0         0         0         0        11
```

```
        LAMBDA-X

                 Gr1       Gr2      Gr12
              --------  --------  --------
   VAR 1           12         0         0
   VAR 2            0        13         0
   VAR 3            0         0        14
```

```
        BETA

                 Rel     Scape      Emot      Cogn     Loyal
              --------  --------  --------  --------  --------
     Rel            0         0         0         0         0
   Scape            0         0         0         0         0
    Emot           15        16         0         0         0
    Cogn           17        18         0         0         0
   Loyal            0         0        19        20         0
```

```
        GAMMA

                 Gr1       Gr2      Gr12
              --------  --------  --------
     Rel           21        22        23
   Scape           24        25        26
    Emot            0         0         0
    Cogn            0         0         0
   Loyal            0         0         0
```

```
        PHI

                 Gr1       Gr2      Gr12
              --------  --------  --------
     Gr1            0
     Gr2           27         0
    Gr12           28        29         0
```

```
        PSI

                 Rel     Scape      Emot      Cogn     Loyal
              --------  --------  --------  --------  --------
                  30        31        32        33        34
```

```
        THETA-EPS

               VAR 11    VAR 12    VAR 13    VAR 14    VAR 15    VAR 16
              --------  --------  --------  --------  --------  --------
                  35        36        37        38        39        40
```

```
        THETA-EPS

               VAR 4     VAR 5     VAR 7     VAR 6     VAR 8     VAR 9
              --------  --------  --------  --------  --------  --------
                  41        42        43        44        45        46
```

```
        THETA-EPS

               VAR 10    VAR 17    VAR 18    VAR 19
              --------  --------  --------  --------
                  47        48        49        50
```

```
DA NO=124 NI=19 MA=CM

Number of Iterations = 28

LISREL Estimates (Maximum Likelihood)

        LAMBDA-Y

              Rel      Scape      Emot      Cogn      Loyal
           --------  --------  --------  --------  --------
   VAR 11    1.486      - -       - -       - -       - -

   VAR 12    1.641      - -       - -       - -       - -
           (0.101)
            16.195

   VAR 13    1.276      - -       - -       - -       - -
           (0.106)
            12.035

   VAR 14     - -      1.643      - -       - -       - -

   VAR 15     - -      1.666      - -       - -       - -
                     (0.117)
                      14.184

   VAR 16     - -      1.679      - -       - -       - -
                     (0.113)
                      14.822

    VAR 4     - -       - -      0.555      - -       - -

    VAR 5     - -       - -      1.030      - -       - -
                               (0.288)
                                3.581

    VAR 7     - -       - -      1.192      - -       - -
                               (0.338)
                                3.528

    VAR 6     - -       - -       - -      1.154      - -

    VAR 8     - -       - -       - -      1.035      - -
                                        (0.091)
                                         11.397

    VAR 9     - -       - -       - -      1.257      - -
                                        (0.104)
                                         12.097

   VAR 10     - -       - -       - -      1.270      - -
                                        (0.101)
                                         12.632

   VAR 17     - -       - -       - -       - -      1.036

   VAR 18     - -       - -       - -       - -      1.292
                                                  (0.106)
                                                   12.131

   VAR 19     - -       - -       - -       - -      1.238
                                                  (0.104)
                                                   11.936


        LAMBDA-X

              Gr1       Gr2      Gr12
           --------  --------  --------
    VAR 1    0.439      - -       - -
           (0.028)
            15.748

    VAR 2     - -      0.430      - -
```

```
                         (0.027)
                         15.748

VAR 3          - -          - -          0.430
                                        (0.027)
                                        15.748


        BETA

                 Rel       Scape      Emot       Cogn       Loyal
               --------   --------   --------   --------   --------
    Rel          - -        - -        - -        - -        - -

  Scape          - -        - -        - -        - -        - -

   Emot        0.117      0.234        - -        - -        - -
              (0.105)    (0.119)
                1.115      1.965

   Cogn        0.115      0.099        - -        - -        - -
              (0.094)    (0.096)
                1.220      1.024

  Loyal          - -        - -      0.368      0.515        - -
                                    (0.129)    (0.091)
                                      2.851      5.688


        GAMMA

                 Gr1        Gr2        Gr12
               --------   --------   --------
    Rel        0.159      0.040      0.267
              (0.109)    (0.107)    (0.109)
                1.465      0.368      2.436

  Scape        0.153     -0.022      0.218
              (0.111)    (0.110)    (0.111)
                1.379     -0.200      1.963

   Emot          - -        - -        - -

   Cogn          - -        - -        - -

  Loyal          - -        - -        - -


        Covariance Matrix of ETA and KSI

                 Rel       Scape      Emot       Cogn       Loyal       Gr1
               --------   --------   --------   --------   --------   --------
    Rel        1.000
  Scape        0.055      1.000
   Emot        0.130      0.241      1.000
   Cogn        0.121      0.105      0.039      1.000
  Loyal        0.110      0.143      0.388      0.529      1.000
    Gr1        0.057      0.088      0.027      0.015      0.018      1.000
    Gr2       -0.099     -0.143     -0.045     -0.025     -0.030     -0.333
   Gr12        0.201      0.174      0.064      0.040      0.044     -0.333

        Covariance Matrix of ETA and KSI

                 Gr2        Gr12
               --------   --------
    Gr2        1.000
   Gr12       -0.319      1.000


        PHI

                 Gr1        Gr2        Gr12
               --------   --------   --------
    Gr1        1.000

    Gr2       -0.333      1.000
              (0.080)
               -4.174
```

```
Gr12     -0.333    -0.319     1.000
         (0.080)   (0.081)
         -4.174    -3.957
```

```
        PSI
        Note: This matrix is diagonal.

              Rel      Scape      Emot      Cogn     Loyal
           --------   --------  --------  --------  --------
             0.941      0.945     0.928     0.976     0.585
            (0.153)    (0.153)   (0.490)   (0.170)   (0.119)
             6.156      6.189     1.895     5.741     4.904
```

```
        Squared Multiple Correlations for Structural Equations

              Rel      Scape      Emot      Cogn     Loyal
           --------   --------  --------  --------  --------
             0.059      0.055     0.072     0.024     0.415
```

NOTE: R² for Structural Equatios are Hayduk's (2006) Blocked-Error R²

```
        Reduced Form

              Gr1       Gr2      Gr12
           --------  --------  --------
   Rel       0.159     0.040     0.267
            (0.109)   (0.108)   (0.110)
             1.459     0.367     2.427

   Scape     0.153    -0.022     0.218
            (0.112)   (0.110)   (0.112)
             1.373    -0.199     1.955

   Emot      0.055    -0.001     0.082
            (0.039)   (0.029)   (0.050)
             1.400    -0.018     1.663

   Cogn      0.033     0.002     0.052
            (0.026)   (0.017)   (0.036)
             1.263     0.140     1.446

   Loyal     0.037     0.001     0.057
            (0.024)   (0.019)   (0.029)
             1.570     0.055     1.954
```

```
        Squared Multiple Correlations for Reduced Form

              Rel      Scape      Emot      Cogn     Loyal
           --------   --------  --------  --------  --------
             0.059      0.055     0.007     0.003     0.003
```

```
        THETA-EPS

             VAR 11    VAR 12    VAR 13    VAR 14    VAR 15    VAR 16
           --------  --------  --------  --------  --------  --------
             0.611     0.094     0.897     0.713     0.712     0.529
            (0.113)   (0.101)   (0.129)   (0.133)   (0.135)   (0.122)
             5.408     0.933     6.944     5.356     5.273     4.347
```

```
        THETA-EPS

             VAR 4     VAR 5     VAR 7     VAR 6     VAR 8     VAR 9
           --------  --------  --------  --------  --------  --------
             1.913     0.882     0.713     0.514     0.481     0.545
            (0.255)   (0.211)   (0.254)   (0.085)   (0.076)   (0.093)
             7.511     4.186     2.811     6.069     6.330     5.847
```

```
        THETA-EPS

             VAR 10    VAR 17    VAR 18    VAR 19
           --------  --------  --------  --------
```

```
      0.441     0.575     0.292     0.334
     (0.083)   (0.086)   (0.076)   (0.075)
      5.310     6.649     3.840     4.475
```

Squared Multiple Correlations for Y - Variables

```
        VAR 11    VAR 12    VAR 13    VAR 14    VAR 15    VAR 16
        --------  --------  --------  --------  --------  --------
         0.783     0.966     0.645     0.791     0.796     0.842
```

Squared Multiple Correlations for Y - Variables

```
        VAR 4     VAR 5     VAR 7     VAR 6     VAR 8     VAR 9
        --------  --------  --------  --------  --------  --------
         0.139     0.546     0.666     0.721     0.690     0.743
```

Squared Multiple Correlations for Y - Variables

```
        VAR 10    VAR 17    VAR 18    VAR 19
        --------  --------  --------  --------
         0.786     0.651     0.851     0.821
```

W_A_R_N_I_N_G: THETA-DELTA is not positive definite

Squared Multiple Correlations for X - Variables

```
        VAR 1     VAR 2     VAR 3
        --------  --------  --------
         1.000     1.000     1.000
```

Log-likelihood Values

```
                              Estimated Model      Saturated Model
                              ---------------      ---------------
Number of free parameters(t)        50                   190
-2ln(L)                          1964.850             1660.875
AIC (Akaike, 1974)*              2064.850             2040.875
BIC (Schwarz, 1978)*             2205.864             2576.729
```

*LISREL uses AIC= 2t - 2ln(L) and BIC = tln(N)- 2ln(L)

Goodness-of-Fit Statistics

```
Degrees of Freedom for (C1)-(C2)                   140
Maximum Likelihood Ratio Chi-Square (C1)           303.974 (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NT)             243.470 (P = 0.0000)

Estimated Non-centrality Parameter (NCP)           163.974
90 Percent Confidence Interval for NCP             (117.480 ; 218.213)

Minimum Fit Function Value                         2.451
Population Discrepancy Function Value (F0)          1.322
90 Percent Confidence Interval for F0              (0.947 ; 1.760)
Root Mean Square Error of Approximation (RMSEA)    0.0972
90 Percent Confidence Interval for RMSEA           (0.0823 ; 0.112)
P-Value for Test of Close Fit (RMSEA < 0.05)       0.000

Expected Cross-Validation Index (ECVI)             3.258
90 Percent Confidence Interval for ECVI            (2.883 ; 3.695)
ECVI for Saturated Model                           3.065
ECVI for Independence Model                        14.346

Chi-Square for Independence Model (171 df)      1740.931

Normed Fit Index (NFI)                             0.825
Non-Normed Fit Index (NNFI)                        0.872
Parsimony Normed Fit Index (PNFI)                  0.676
Comparative Fit Index (CFI)                        0.896
Incremental Fit Index (IFI)                        0.898
Relative Fit Index (RFI)                           0.787

Critical N (CN)                                    74.580


Root Mean Square Residual (RMR)                    0.451
```

```
Standardized RMR                                0.164
Goodness of Fit Index (GFI)                     0.829
Adjusted Goodness of Fit Index (AGFI)           0.768
Parsimony Goodness of Fit Index (PGFI)          0.611
```

Measurement Model Output:

```
   Covariance Matrix

            VAR 11     VAR 12     VAR 13     VAR 14     VAR 15     VAR 16
           --------   --------   --------   --------   --------   --------
   VAR 11    2.818
   VAR 12    2.438      2.786
   VAR 13    1.894      2.095      2.526
   VAR 14    1.895      1.957      2.007      3.414
   VAR 15    1.986      2.095      1.953      2.732      3.486
   VAR 16    2.220      2.120      1.969      2.771      2.792      3.349
   VAR 4     0.463      0.595      0.435      0.345      0.474      0.422
   VAR 5     0.638      0.509      0.471      0.338      0.499      0.504
   VAR 7     0.672      0.460      0.341      0.594      0.709      0.739
   VAR 6     0.409      0.419      0.304      0.372      0.221      0.263
   VAR 8     0.337      0.273      0.314      0.356      0.300      0.227
   VAR 9     0.402      0.434      0.415      0.603      0.628      0.500
   VAR 10    0.246      0.308      0.469      0.347      0.321      0.249
   VAR 17    0.203      0.196      0.313      0.338      0.437      0.255
   VAR 18    0.386      0.327      0.273      0.470      0.382      0.395
   VAR 19    0.392      0.312      0.332      0.487      0.520      0.378
   VAR 1    -0.002      0.044      0.054      0.036      0.084      0.066
   VAR 2    -0.035     -0.069     -0.107     -0.097     -0.128     -0.082
   VAR 3     0.136      0.143      0.089      0.122      0.156      0.105

        Covariance Matrix

            VAR 4      VAR 5      VAR 7      VAR 6      VAR 8      VAR 9
           --------   --------   --------   --------   --------   --------
   VAR 4     2.233
   VAR 5     0.663      1.980
   VAR 7     0.604      1.277      2.185
   VAR 6     0.815      0.011      0.375      1.865
   VAR 8     0.732      0.090      0.417      1.210      1.569
   VAR 9     0.895      0.042      0.460      1.510      1.316      2.147
   VAR 10    0.709      0.099      0.357      1.473      1.359      1.585
   VAR 17    0.650      0.356      0.469      0.626      0.676      0.835
   VAR 18    0.687      0.550      0.913      0.728      0.681      0.886
   VAR 19    0.657      0.425      0.798      0.866      0.704      1.043
   VAR 1     0.115      0.065      0.083     -0.013      0.010      0.097
   VAR 2    -0.054     -0.073     -0.075     -0.048     -0.022     -0.093
   VAR 3     0.043     -0.016     -0.018      0.066      0.043      0.062

         Covariance Matrix

            VAR 10     VAR 17     VAR 18     VAR 19     VAR 1      VAR 2
           --------   --------   --------   --------   --------   --------
   VAR 10    2.078
   VAR 17    1.042      1.719
   VAR 18    1.006      1.437      2.070
   VAR 19    1.051      1.352      1.703      1.966
   VAR 1     0.005      0.027      0.071      0.056      0.193
   VAR 2    -0.066     -0.076     -0.063     -0.072     -0.063      0.185
   VAR 3     0.105      0.087     -0.014      0.009     -0.063     -0.059

          Covariance Matrix

            VAR 3
           --------
   VAR 3     0.185
```

Total Variance = 38.754 Generalized Variance = 0.00368

Largest Eigenvalue = 15.707 Smallest Eigenvalue = 0.056

Condition Number = 16.820

```
DA NO=124 NI=19 MA=CM
```

Parameter Specifications

LAMBDA-X

	Rel	Scape	Emot	Cogn	Loyal	Gr1
VAR 11	1	0	0	0	0	0
VAR 12	2	0	0	0	0	0
VAR 13	3	0	0	0	0	0
VAR 14	0	4	0	0	0	0
VAR 15	0	5	0	0	0	0
VAR 16	0	6	0	0	0	0
VAR 4	0	0	7	0	0	0
VAR 5	0	0	8	0	0	0
VAR 7	0	0	9	0	0	0
VAR 6	0	0	0	10	0	0
VAR 8	0	0	0	11	0	0
VAR 9	0	0	0	12	0	0
VAR 10	0	0	0	13	0	0
VAR 17	0	0	0	0	14	0
VAR 18	0	0	0	0	15	0
VAR 19	0	0	0	0	16	0
VAR 1	0	0	0	0	0	17
VAR 2	0	0	0	0	0	0
VAR 3	0	0	0	0	0	0

LAMBDA-X

	Gr2	Gr12
VAR 11	0	0
VAR 12	0	0
VAR 13	0	0
VAR 14	0	0
VAR 15	0	0
VAR 16	0	0
VAR 4	0	0
VAR 5	0	0
VAR 7	0	0
VAR 6	0	0
VAR 8	0	0
VAR 9	0	0
VAR 10	0	0
VAR 17	0	0
VAR 18	0	0
VAR 19	0	0
VAR 1	0	0
VAR 2	18	0
VAR 3	0	19

PHI

	Rel	Scape	Emot	Cogn	Loyal	Gr1
Rel	0					
Scape	20	0				
Emot	21	22	0			
Cogn	23	24	25	0		
Loyal	26	27	28	29	0	
Gr1	30	31	32	33	34	35
Gr2	36	37	38	39	40	41
Gr12	43	44	45	46	47	48

PHI

	Gr2	Gr12
Gr2	42	
Gr12	49	50

THETA-DELTA

	VAR 11	VAR 12	VAR 13	VAR 14	VAR 15	VAR 16

```
          --------   --------   --------   --------   --------   --------
              51         52         53         54         55         56


          THETA-DELTA

             VAR 4      VAR 5      VAR 7      VAR 6      VAR 8      VAR 9
          --------   --------   --------   --------   --------   --------
              57         58         59         60         61         62


          THETA-DELTA

            VAR 10     VAR 17     VAR 18     VAR 19      VAR 1      VAR 2
          --------   --------   --------   --------   --------   --------
              63         64         65         66          0          0


          THETA-DELTA

             VAR 3
          --------
               0
```

W_A_R_N_I_N_G: THETA-DELTA is not positive definite

DA NO=124 NI=19 MA=CM

Number of Iterations = 50

LISREL Estimates (Maximum Likelihood)

          LAMBDA-X

```
                 Rel      Scape       Emot       Cogn      Loyal        Gr1
             --------   --------   --------   --------   --------   --------
  VAR 11        1.522       - -        - -        - -        - -        - -
  VAR 12        1.589       - -        - -        - -        - -        - -
  VAR 13        1.309       - -        - -        - -        - -        - -
  VAR 14         - -       1.629       - -        - -        - -        - -
  VAR 15         - -       1.659       - -        - -        - -        - -
  VAR 16         - -       1.697       - -        - -        - -        - -
   VAR 4         - -        - -       0.598       - -        - -        - -
   VAR 5         - -        - -       1.026       - -        - -        - -
   VAR 7         - -        - -       1.219       - -        - -        - -
   VAR 6         - -        - -        - -       1.161       - -        - -
   VAR 8         - -        - -        - -       1.043       - -        - -
   VAR 9         - -        - -        - -       1.264       - -        - -
  VAR 10         - -        - -        - -       1.282       - -        - -
  VAR 17         - -        - -        - -        - -       1.068       - -
  VAR 18         - -        - -        - -        - -       1.333       - -
  VAR 19         - -        - -        - -        - -       1.278       - -
   VAR 1         - -        - -        - -        - -        - -       0.932
   VAR 2         - -        - -        - -        - -        - -        - -
   VAR 3         - -        - -        - -        - -        - -        - -
```

          LAMBDA-X

```
                 Gr2       Gr12
             --------   --------
  VAR 11        - -        - -
  VAR 12        - -        - -
  VAR 13        - -        - -
  VAR 14        - -        - -
  VAR 15        - -        - -
  VAR 16        - -        - -
   VAR 4        - -        - -
   VAR 5        - -        - -
   VAR 7        - -        - -
   VAR 6        - -        - -
   VAR 8        - -        - -
   VAR 9        - -        - -
  VAR 10        - -        - -
  VAR 17        - -        - -
  VAR 18        - -        - -
  VAR 19        - -        - -
   VAR 1        - -        - -
   VAR 2       0.943       - -
```

```
     VAR 3      - -       0.946

       PHI

             Rel      Scape     Emot      Cogn     Loyal      Gr1
           --------  --------  --------  --------  --------  --------
     Rel    1.000
   Scape    0.806     1.000
    Emot    0.311     0.321     1.000
    Cogn    0.195     0.177     0.246     1.000
   Loyal    0.163     0.194     0.483     0.574     1.000
     Gr1    0.023     0.041     0.079     0.022     0.049     0.222
     Gr2   -0.045    -0.063    -0.070    -0.052    -0.058    -0.072
    Gr12    0.092     0.079    -0.011     0.063     0.011    -0.071

       PHI

             Gr2      Gr12
           --------  --------
     Gr2    0.208
    Gr12   -0.066     0.206

       THETA-DELTA

            VAR 11    VAR 12    VAR 13    VAR 14    VAR 15    VAR 16
           --------  --------  --------  --------  --------  --------
             0.501     0.260     0.812     0.760     0.733     0.471

       THETA-DELTA

            VAR 4     VAR 5     VAR 7     VAR 6     VAR 8     VAR 9
           --------  --------  --------  --------  --------  --------
             1.875     0.927     0.700     0.517     0.481     0.549

       THETA-DELTA

            VAR 10    VAR 17    VAR 18    VAR 19    VAR 1     VAR 2
           --------  --------  --------  --------  --------  --------
             0.436     0.577     0.292     0.333     - -       - -

       THETA-DELTA

            VAR 3
           --------
             - -
```

W_A_R_N_I_N_G: THETA-DELTA is not positive definite

Log-likelihood Values

```
                          Estimated Model        Saturated Model
                          ---------------        ---------------
Number of free parameters(t)      66                    190
-2ln(L)                        1858.407              1660.875
AIC (Akaike, 1974)*            1990.407              2040.875
BIC (Schwarz, 1978)*           2176.545              2576.729
```

*LISREL uses AIC= 2t - 2ln(L) and BIC = tln(N)- 2ln(L)

Goodness-of-Fit Statistics

```
Degrees of Freedom for (C1)-(C2)                124
Maximum Likelihood Ratio Chi-Square (C1)        197.532 (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NT)          0.0 (P = 1.0000)

Estimated Non-centrality Parameter (NCP)        73.532
90 Percent Confidence Interval for NCP          (39.144 ; 115.845)

Minimum Fit Function Value                      1.593
Population Discrepancy Function Value (F0)      0.593
90 Percent Confidence Interval for F0           (0.316 ; 0.934)
Root Mean Square Error of Approximation (RMSEA) 0.0692
90 Percent Confidence Interval for RMSEA        (0.0505 ; 0.0868)
P-Value for Test of Close Fit (RMSEA < 0.05)    0.0464

Expected Cross-Validation Index (ECVI)          2.658
```

```
90 Percent Confidence Interval for ECVI          (2.380 ; 2.999)
ECVI for Saturated Model                         3.065
ECVI for Independence Model                      14.346

Chi-Square for Independence Model (171 df)       1740.931

Normed Fit Index (NFI)                           0.887
Non-Normed Fit Index (NNFI)                      0.935
Parsimony Normed Fit Index (PNFI)                0.643
Comparative Fit Index (CFI)                      0.953
Incremental Fit Index (IFI)                      0.955
Relative Fit Index (RFI)                         0.844

Critical N (CN)                                  102.838


Root Mean Square Residual (RMR)                  0.132
Standardized RMR                                 0.0646
Goodness of Fit Index (GFI)                      0.865
Adjusted Goodness of Fit Index (AGFI)            0.793
Parsimony Goodness of Fit Index (PGFI)           0.564
```

Appendix L: Indirect Effects Test Output (LISREL)

Covariance Matrix

	Emo_1	Emo_2	Cog_1	Emo_3	Cog_2	Cog_3
Emo_1	2.233					
Emo_2	0.663	1.980				
Cog_1	0.815	0.011	1.865			
Emo_3	0.604	1.277	0.375	2.185		
Cog_2	0.732	0.090	1.210	0.417	1.569	
Cog_3	0.895	0.042	1.510	0.460	1.316	2.147
Cog_4	0.709	0.099	1.473	0.357	1.359	1.585
Rel_1	0.463	0.638	0.409	0.672	0.337	0.402
Rel_2	0.595	0.509	0.419	0.460	0.273	0.434
Rel_3	0.435	0.471	0.304	0.341	0.314	0.415
Sca_1	0.345	0.338	0.372	0.594	0.356	0.603
Sca_2	0.474	0.499	0.221	0.709	0.300	0.628
Sca_3	0.422	0.504	0.263	0.739	0.227	0.500
Loy_1	0.650	0.356	0.626	0.469	0.676	0.835
Loy_2	0.687	0.550	0.728	0.913	0.681	0.886
Loy_3	0.657	0.425	0.866	0.798	0.704	1.043
Case_2	0.115	0.065	-0.013	0.083	0.010	0.097
Case_3	-0.054	-0.073	-0.048	-0.075	-0.022	-0.093
Case_4	0.043	-0.016	0.066	-0.018	0.043	0.062

Covariance Matrix

	Cog_4	Rel_1	Rel_2	Rel_3	Sca_1	Sca_2
Cog_4	2.078					
Rel_1	0.246	2.818				
Rel_2	0.308	2.438	2.786			
Rel_3	0.469	1.894	2.095	2.526		
Sca_1	0.347	1.895	1.957	2.008	3.414	
Sca_2	0.321	1.986	2.095	1.953	2.732	3.486
Sca_3	0.249	2.220	2.120	1.969	2.771	2.792
Loy_1	1.042	0.203	0.196	0.313	0.338	0.437
Loy_2	1.006	0.386	0.327	0.273	0.470	0.382
Loy_3	1.051	0.392	0.312	0.332	0.487	0.520
Case_2	0.005	-0.002	0.044	0.054	0.036	0.084
Case_3	-0.066	-0.035	-0.069	-0.107	-0.097	-0.128
Case_4	0.105	0.136	0.143	0.089	0.122	0.156

Covariance Matrix

	Sca_3	Loy_1	Loy_2	Loy_3	Case_2	Case_3
Sca_3	3.349					
Loy_1	0.255	1.719				

```
      Loy_2      0.395      1.437      2.069
      Loy_3      0.378      1.352      1.703      1.966
     Case_2      0.066      0.027      0.071      0.056      0.193
     Case_3     -0.082     -0.076     -0.063     -0.072     -0.063      0.185
     Case_4      0.105      0.087     -0.014      0.009     -0.063     -0.059
```

         Covariance Matrix

```
             Case_4
            --------
    Case_4     0.185
```

Total Variance = 38.753 Generalized Variance = 0.00368

Largest Eigenvalue = 15.707 Smallest Eigenvalue = 0.056

Condition Number = 16.820

Rebuild Normal t

Number of Iterations = 42

LISREL Estimates (Maximum Likelihood)

         Measurement Equations

```
   Emo_1 = 0.560*Emot, Errorvar.= 1.905 , R≤ = 0.142
Standerr                       (0.255)
Z-values                        7.464
P-values                        0.000

   Emo_2 = 1.035*Emot, Errorvar.= 0.861 , R≤ = 0.555
Standerr  (0.289)               (0.213)
Z-values   3.587                 4.052
P-values   0.000                 0.000

   Cog_1 = 1.150*Cogn, Errorvar.= 0.513  , R≤ = 0.722
Standerr                       (0.0849)
Z-values                        6.042
P-values                        0.000

   Emo_3 = 1.174*Emot, Errorvar.= 0.748 , R≤ = 0.649
Standerr  (0.331)               (0.251)
Z-values   3.545                 2.974
P-values   0.000                 0.003

   Cog_2 = 1.031*Cogn, Errorvar.= 0.482  , R≤ = 0.690
Standerr  (0.0908)              (0.0763)
```

```
Z-values   11.355              6.309
P-values   0.000               0.000


   Cog_3 = 1.251*Cogn, Errorvar.= 0.548  , R≤ = 0.742
Standerr  (0.104)             (0.0938)
Z-values   12.040              5.842
P-values   0.000               0.000


   Cog_4 = 1.266*Cogn, Errorvar.= 0.439  , R≤ = 0.786
Standerr  (0.100)             (0.0831)
Z-values   12.601              5.281
P-values   0.000               0.000


   Rel_1 = 1.490*Rel, Errorvar.= 0.608 , R≤ = 0.784
Standerr                     (0.113)
Z-values                      5.386
P-values                      0.000


   Rel_2 = 1.644*Rel, Errorvar.= 0.0966, R≤ = 0.965
Standerr  (0.102)             (0.100)
Z-values   16.164              0.961
P-values   0.000               0.336


   Rel_3 = 1.280*Rel, Errorvar.= 0.896 , R≤ = 0.645
Standerr  (0.107)             (0.129)
Z-values   12.000              6.917
P-values   0.000               0.000


   Sca_1 = 1.640*Scape, Errorvar.= 0.711 , R≤ = 0.792
Standerr                     (0.134)
Z-values                      5.324
P-values                      0.000


   Sca_2 = 1.662*Scape, Errorvar.= 0.711 , R≤ = 0.796
Standerr  (0.118)             (0.135)
Z-values   14.141              5.248
P-values   0.000               0.000


   Sca_3 = 1.674*Scape, Errorvar.= 0.532 , R≤ = 0.841
Standerr  (0.113)             (0.122)
Z-values   14.764              4.349
P-values   0.000               0.000


   Loy_1 = 1.040*Loyal, Errorvar.= 0.576  , R≤ = 0.652
Standerr                     (0.0869)
Z-values                      6.630
P-values                      0.000


   Loy_2 = 1.297*Loyal, Errorvar.= 0.293  , R≤ = 0.852
Standerr  (0.107)             (0.0762)
Z-values   12.130              3.840
```

```
P-values   0.000                    0.000


   Loy_3 = 1.244*Loyal, Errorvar.= 0.333  , R≤ = 0.823
Standerr  (0.104)                  (0.0747)
Z-values  11.938                   4.455
P-values   0.000                    0.000



  Case_2 = 0.439*Gr1,, R≤ = 1.000
Standerr  (0.0280)
Z-values  15.684
P-values   0.000


  Case_3 = 0.430*Gr2,, R≤ = 1.000
Standerr  (0.0274)
Z-values  15.684
P-values   0.000


  Case_4 = 0.430*Gr12,, R≤ = 1.000
Standerr  (0.0274)
Z-values  15.684
P-values   0.000



        Structural Equations



   Loyal = 0.520*Cogn + 0.364*Emot + 0.0578*Scape - 0.0878*Rel + 0.00557*Gr1 - 0.0400*Gr2 -
0.0470*Gr12, Errorvar.= 0.572 ,
 Standerr  (0.0908)       (0.130)        (0.0845)        (0.0819)        (0.0936)        (0.0916)
(0.0956)               (0.117)
 Z-values  5.732         2.793          0.684          -1.073          0.0595          -0.437        -
0.491               4.888
 P-values  0.000         0.005          0.494          0.283          0.953          0.662          0.623
0.000


          R≤ = 0.428


  Cogn = 0.0940*Scape + 0.123*Rel, Errorvar.= 0.982 , R≤ = 0.0249
Standerr  (0.0966)        (0.0951)                (0.171)
Z-values  0.973          1.289                   5.744
P-values  0.331          0.197                   0.000


  Emot = 0.219*Scape + 0.140*Rel, Errorvar.= 0.933 , R≤ = 0.0706
Standerr  (0.118)         (0.108)                (0.488)
Z-values  1.855          1.295                   1.912
P-values  0.064          0.195                   0.056


  Scape = 0.154*Gr1 - 0.0219*Gr2 + 0.219*Gr12, Errorvar.= 0.950 , R≤ = 0.0547
Standerr  (0.111)       (0.110)       (0.112)               (0.153)
Z-values  1.378         -0.198        1.965                 6.193
```

```
P-values   0.168       0.843        0.049                    0.000


     Rel = 0.159*Gr1 + 0.0392*Gr2 + 0.266*Gr12, Errorvar.= 0.937 , R² = 0.0588
Standerr  (0.108)     (0.107)      (0.109)                  (0.152)
Z-values  1.464        0.366        2.435                    6.161
P-values  0.143        0.714        0.015                    0.000



NOTE: R² for Structural Equations are Hayduk's (2006) Blocked-Error R²

        Reduced Form Equations

  Loyal = 0.0384*Gr1 - 0.0430*Gr2 + 0.00103*Gr12, Errorvar.= 0.995, R² = 0.00444
Standerr  (0.0953)     (0.0941)     (0.0957)
Z-values  0.404        -0.457       0.0107
P-values  0.687        0.648        0.991

   Cogn = 0.0339*Gr1 + 0.00276*Gr2 + 0.0532*Gr12, Errorvar.= 1.005, R² = 0.00261
Standerr  (0.0267)     (0.0174)     (0.0365)
Z-values  1.268        0.159        1.461
P-values  0.205        0.874        0.144

   Emot = 0.0558*Gr1 + 0.000715*Gr2 + 0.0852*Gr12, Errorvar.= 0.997, R² = 0.00710
Standerr  (0.0390)     (0.0289)     (0.0499)
Z-values  1.432        0.0248       1.707
P-values  0.152        0.980        0.088

  Scape = 0.154*Gr1 - 0.0219*Gr2 + 0.219*Gr12, Errorvar.= 0.950, R² = 0.0547
Standerr  (0.112)      (0.111)      (0.112)
Z-values  1.372        -0.197       1.957
P-values  0.170        0.844        0.050

    Rel = 0.159*Gr1 + 0.0392*Gr2 + 0.266*Gr12, Errorvar.= 0.937, R² = 0.0588
Standerr  (0.109)      (0.107)      (0.110)
Z-values  1.458        0.365        2.425
P-values  0.145        0.715        0.015



        Correlation Matrix of Independent Variables

          Gr1        Gr2        Gr12
        --------   --------   --------
   Gr1    1.000

   Gr2   -0.333      1.000
         (0.080)
         -4.173

  Gr12   -0.333     -0.319      1.000
         (0.080)    (0.081)
         -4.173     -3.957
```

```
        Covariance Matrix of Latent Variables


          Loyal       Cogn       Emot      Scape        Rel        Gr1

        --------   --------   --------   --------   --------   --------

  Loyal    0.999
   Cogn    0.533      1.008
   Emot    0.385      0.040      1.004
  Scape    0.187      0.101      0.227      1.005
    Rel    0.032      0.127      0.151      0.055      0.995
    Gr1    0.052      0.015      0.027      0.088      0.057      1.000
    Gr2   -0.056     -0.026     -0.045     -0.143     -0.099     -0.333
   Gr12    0.002      0.041      0.066      0.175      0.201     -0.333


        Covariance Matrix of Latent Variables


          Gr2       Gr12

        --------   --------

    Gr2    1.000
   Gr12   -0.319      1.000



                   Log-likelihood Values


            Estimated Model        Saturated Model
            ---------------        ---------------

Number of free parameters(t)      55                    190
-2ln(L)                        1963.614               1660.837
AIC (Akaike, 1974)*            2073.614               2040.837
BIC (Schwarz, 1978)*           2228.729               2576.691


*LISREL uses AIC= 2t - 2ln(L) and BIC = tln(N)- 2ln(L)




                Goodness-of-Fit Statistics

Degrees of Freedom for (C1)-(C2)                135
Maximum Likelihood Ratio Chi-Square (C1)        302.777 (P = 0.0000)
Browne's (1984) ADF Chi-Square (C2_NT)          242.445 (P = 0.0000)


Estimated Non-centrality Parameter (NCP)        167.777
90 Percent Confidence Interval for NCP          (121.137 ; 222.148)


Minimum Fit Function Value                      2.442
Population Discrepancy Function Value (F0)       1.353
90 Percent Confidence Interval for F0           (0.977 ; 1.792)
Root Mean Square Error of Approximation (RMSEA) 0.100
90 Percent Confidence Interval for RMSEA        (0.0851 ; 0.115)
P-Value for Test of Close Fit (RMSEA < 0.05)    0.000


Expected Cross-Validation Index (ECVI)          3.329
```

```
90 Percent Confidence Interval for ECVI            (2.953 ; 3.767)
ECVI for Saturated Model                           3.065
ECVI for Independence Model                        14.347


Chi-Square for Independence Model (171 df)      1740.967


Normed Fit Index (NFI)                             0.826
Non-Normed Fit Index (NNFI)                        0.865
Parsimony Normed Fit Index (PNFI)                  0.652
Comparative Fit Index (CFI)                        0.893
Incremental Fit Index (IFI)                        0.896
Relative Fit Index (RFI)                           0.780


Critical N (CN)                                    72.555



Root Mean Square Residual (RMR)                    0.452
Standardized RMR                                   0.164
Goodness of Fit Index (GFI)                        0.829
Adjusted Goodness of Fit Index (AGFI)              0.760
Parsimony Goodness of Fit Index (PGFI)             0.589

        The Modification Indices Suggest to Add the
 Path to  from     Decrease in Chi-Square     New Estimate
Emo_1     Cogn            18.8                    0.57
Scape     Emot            18.6                    1.65
Scape     Rel             64.0                    0.77
Rel       Loyal           31.9                    2.24
Rel       Emot            34.7                    1.82
Rel       Scape           64.0                    0.76


The Modification Indices Suggest to Add an Error Covariance
 Between    and     Decrease in Chi-Square     New Estimate
Rel       Scape           64.0                    0.72
Sca_3     Rel_1            9.9                     0.22
Loy_1     Cog_4            8.8                     0.17
Case_2    Case_2          64.0                    5.70
Case_3    Case_2          64.0                   53.07
Case_3    Case_3          64.0                 -155.04
Case_4    Case_2          64.0                    1.80
Case_4    Case_3          64.0                   47.75
Case_4    Case_4          64.0                    2.28
```

Appendix M: Covariance Matrix

Construct	P.C. CustR	P.C. ServS	EMO	COG	LOY	ServS	CustR	ServS x CustR
P.C. CustR	**1,000**							
P.C. ServS	0,055	**1,000**						
EMO	0,130	0,241	**1,000**					
COG	0,121	0,105	0,039	**1,000**				
LOY	0,110	0,143	0,388	0,529	**1,000**			
ServS	0,057	0,088	0,027	0,015	0,018	**1,000**		
CustR	-0,099	-0,143	-0,045	-0,025	-0,030	-0,333	**1,000**	
ServS x CustR	0,201	0,174	0,174	0,040	0,044	-0,333	-0,319	**1,000**

(P.C. = for perceived change in)