TAMPEREEN TEKNILLINEN YLIOPISTO
TAMPERE UNIVERSITY OF TECHNOLOGY

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Eco-friendliness in the Brand Experience of High-Tech Products

Julkaisu 1363 • Publication 1363

Tampere 2016

Tampereen teknillinen yliopisto. Julkaisu 1363
Tampere University of Technology. Publication 1363

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Eco-Friendliness in the Brand Experience of High-Tech Products

Thesis for the degree of Doctor of Science in Technology to be presented with due permission for public examination and criticism in Festia Building, Auditorium Pieni Sali 1, at Tampere University of Technology, on the 10th of February 2016, at 12 noon.

Tampereen teknillinen yliopisto - Tampere University of Technology
Tampere 2016

ISBN 978-952-15-3670-0 (printed)
ISBN 978-952-15-3690-8 (PDF)
ISSN 1459-2045

ABSTRACT

The focus in this research is to develop a brand measurement scale for measuring how consumers experience eco-friendliness when reflecting on global high-tech brands. The aim is to examine can the eco-friendliness dimension in the brand experience of a high-tech brand be measured with a brand experience measurement scale by extending the research of Brakus et al. (2009). This research topic was selected because also high-tech companies are facing the need to analyze how consumers view the eco-friendliness of their brands in order to create greener products that could also benefit the financial performance of the company (Siegel, 2009). Eco-friendliness can be seen as an important factor for consumers when they are purchasing e.g. fast-moving consumer goods (McDonald *et al.*, 2009) and automobiles (Kim, 2011). However, it is not still considered to be so relevant when buying consumer electronics or high-tech products and this is an area that has not been researched as extensively (McDonald *et al.*, 2009). This dissertation focuses on this research gap and investigates how eco-friendliness can be measured in the brand experience of high-tech products.

The approach in this dissertation is empirical and the research has been conducted as a replication and extension of the existing brand experience measurement scale (BBX scale) developed earlier by Brakus et al. (2009). The BBX scale was developed further and extended with a fifth dimension for eco-friendliness to get a better understanding of the concept of eco-friendliness in the brand experience. In the design of the study, the eco-friendliness dimension was created on the basis of the attested dimensions in the BBX model, including affective, behavioral, intellectual and sensory dimensions. The theoretical background of this dissertation is based in management of high-tech innovations and especially consumer behavior and brand management research in this domain. The research includes empirical data collected in a web survey in Finland that was analyzed by using the original BBX model and two different models portraying extensions of the BBX model that also included items on eco-friendliness.

The contribution of this study is that theoretically brand experience was proved to have also an eco-friendliness dimension in addition to the affective, behavioral, intellectual and sensory dimensions included in the original BBX scale. This study succeeded in modelling the general brand experience of mobile phones based on the original BBX model and it was also confirmed that eco-friendliness is an additional, uniquely identifiable fifth dimension in the brand experience of high-tech brands. The implication of this finding is that high-tech companies should also take into account eco-friendliness that has become increasingly important in the management of corporate value and brands in the global competition (Mohr *et al.*, 2010, Keller, 2013) in order to respond to the needs of green consumers (Chatterjee *et al.*, 2010, Aaker, 2011, Kotler, 2011, Ottman, 2011, Accenture and UN_Global_Compact, 2014).

TIIVISTELMÄ

Tämän tutkielman tavoitteena on selvittää, voidaanko korkean teknologian tuotteiden brändikokemusten ympäristöystävällisyyttä mitata brändikokemusmitta-asteikolla. Tässä tutkimuksessa kehitettiin edelleen brändin mitta-asteikkoa, jonka Brakus et al. (2009) ovat luoneet, jotta voitaisiin mitata, kuinka ympäristöystävällisinä kuluttajat pitävät globaaleja korkean teknologian tuotteiden brändejä. Tämä tutkimusaihe valittiin, koska korkean teknologian yritykset pyrkivät enenevässä määrin selvittämään, miten ympäristöystävällisinä kuluttajat pitävät niiden brändejä, jotta yritykset voivat kehittää vihreämpiä tuotteita, jotka voisivat myös hyödyttää yrityksen taloudellista suorituskykyä (Siegel, 2009). Kuluttajat pitävät ympäristöystävällisyyttä tärkeänä tekijänä, kun he ostavat esimerkiksi kertakulutushyödykkeitä (McDonald *et al.*, 2009) ja autoja (Kim, 2011). Tästä huolimatta kuluttajat eivät vielä pidä ympäristöystävällisyyttä yhtä oleellisena seikkana, kun he ostavat kulutuselektroniikkaa tai muita korkean teknologian tuotteita, eikä aihealuetta ei ole vielä tutkittu riittävän laajasti (McDonald *et al.*, 2009). Tämä väitöskirja pyrkii täyttämään tämän tutkimusaukon tarkastelemalla, miten ympäristöystävällisyyttä voidaan mitata osana korkean teknologian tuotteiden brändikokemusta.

Tämä väitöskirja lähestyy tutkimusaihetta empiirisesti tarkastelemalla matkapuhelimia korkean teknologian tuotekategoriasta. Tutkimus on laajennettu toistotutkimus ja pohjautuu Brakuksen kehittämään brändikokemuksen mitta-asteikon (BBX-asteikko) hyödyntämiseen. BBX-asteikko sisältää seuraavat mittausdimensiot: affektiivinen, behavioraalinen, intellektuaalinen ja aistimuksellinen dimensio. Tässä väitöstutkimuksessa BBX-asteikkoa ja -mallia kehitettiin edelleen ja laajennettiin viidennellä mittausdimensiolla, johon sisällytettiin ympäristöystävällisyys, jotta voitaisiin selvittää tarkemmin, kuinka ympäristöystävällisyys voidaan käsitteellisesti määritellä osana brändikokemusta. Tutkimussuunnitelmaa laadittaessa ympäristöystävällisyys-dimensio määriteltiin BBX-mallissa olevien ja jo testattujen dimensioiden avulla. Väitöskirja pohjautuu teoreettiseen kirjallisuuteen, joka käsittelee korkean teknologian innovaatioiden johtamista, kuluttajakäyttäytymistä ja brändien hallintaa. Tässä tutkimuksessa on käytetty empiiristä dataa, joka kerättiin internet-kyselyn avulla Suomessa ja jota analysoitiin käyttämällä alkuperäistä BBX-mallia sekä kahta muuta tässä työssä jatkokehitettyä mallia, jotka sisältävät myös ympäristöystävällisyys-dimension.

Tässä tutkimuksessa todistettiin, että teoreettisesti brändikokemus sisältää myös ympäristöystävällisyys-dimension alkuperäisessä BBX-asteikossa olevien affektiivisen, behavioraalisen, intellektuaalisen ja aistimuksellisen dimensioiden lisäksi. Lisäksi tässä tutkimuksessa onnistuttiin mallintamaan matkapuhelimien yleinen brändikokemus niin kuin se oli määritelty alkuperäisessä BBX-mallissa ja lisäksi varmennettin, että ympäristöystävällisyys todellakin on ylimääräinen ja ainutlaatuinen määriteltävissä oleva viides dimensio korkean teknologian tuotteiden brändikokemuksessa. Tämän

tutkimustuloksen perusteella voidaan päätellä, että korkean teknologian yritysten pitäisi ottaa huomioon myös ympäristöystävällisyyden kasvava merkitys yrityksen arvon ja brändin hallinnassa globaaleilla kilpakentillä (Mohr *et al.*, 2010, Keller, 2013), jotta ne voivat vastata vihreiden kuluttajien vaatimuksiin (Chatterjee *et al.*, 2010, Aaker, 2011, Kotler, 2011, Ottman, 2011, Accenture and UN_Global_Compact, 2014).

ACKNOWLEDGEMENTS

It would not have been possible for me to commence nor finalize this dissertation without the assistance and support from several professors, colleagues in my past and current jobs, my friends and my family. I would like to express my deepest appreciation and thanks to all of the people who have supported me in this work. The main advisors and supporters have been listed below, but there have also been countless very supportive and encouraging discussions with my family members, friends and colleagues that have kept me going and that cannot all be listed here.

First, I would like to express my sincerest appreciation and gratitude to my supervisor Prof. Saku Mäkinen for giving guidance to me in this research project and keeping me on track with constructive feedback all along. I cannot imagine that there could have been a better supervisor for my doctoral thesis.

Besides my supervisor, I would like to convey special thanks to the two pre-examiners, Prof. Joško Brakus from the Leeds University Business School and Prof. Ari-Pekka Hameri from the University of Lausanne. Their review comments helped me to understand some issues and aspects I need to reconsider and take into account in my future research.

Also, I would like to express my genuine gratitude to Prof. Miia Martinsuo for reviewing the final draft version of my thesis and providing me very relevant and useful feedback before I sent my work to the pre-examiners.

My sponsor at Nokia and later at Microsoft, Dr. Petteri Alinikula, merits special thanks for mentoring and supporting me in this research project on the company side. The data collection and participation to two conferences were possible due to his approval.

In addition, I am especially grateful for all of the support I got from the former Sustainability team at Nokia that was then led by Markus Terho, who also advocated my research and gave valuable feedback during the project. I also had many very inspiring and informative discussions on sustainability and my research topic at the Nokia office with Arja Mehtälä, Timo Kolehmainen, Mia Ranta-Aho, Terhi Seuna-McMillan, Laura Varpasuo, Sanna Karhumäki and Helena Castren, who all worked in the Sustainability team at that time.

I am also deeply grateful to my former colleagues at Nokia and Microsoft, Karin Wikström, Miikka Andersson, Antti Koski and Terhi Seuna-McMillan, who participated in the pilot survey and helped me to improve the questionnaire before sending it out to a wider audience. I am also much obliged to my last manager at Nokia and Microsoft, Hannu Kankaanpää, for allowing me to have some flexibility in my working hours, so that I could work on this research project and participate in two conferences.

Finally, I would like to express my warmest thanks to my family for supporting me, especially to Juha and my mother, who both took turns to take care of our household on a short notice whenever I had to travel for my work. And, last but not least, I need to thank my lovely children, Erika and Johannes. The way they have taken care of their own chores at home has allowed me to concentrate on my studies and research. This dissertation is dedicated to Erika and Johannes, who are my pride and joy.

Tampere, 15 November, 2015

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ABBREVIATIONS AND NOTATIONS

AMOS	Statistical software package for structural equation modeling that belongs to the IBM SPSS software collection
BBX	The Brand Experience Measurement Model
BTS	Brand Trust Scale
CBBE	Consumer Based Brand Equity
CBI	Consumer-Brand Identification
CES	Consumption Emotion Descriptors
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CSR	Corporate Social Responsibility
ECCB	Ecologically Conscious Consumer Behavior
EFA	Exploratory Factor Analysis
ESR	Environmental and Social Responsibility
EXQ	Customer Experience Quality
GRI	Global Reporting Initiative
IPT	Information Processing Theory
NEB	Negative Emotions toward Brands
NEP	New Environmental Paradigm
NGO	Non-Governmental Organization
PCA	Principle Component Analysis
RMSEA	Root Mean Square Error of Approximation
SCT	Social Cognitive Theory

SEM	Structural Equation Modelling
SPSS	Software package of IBM originally from the name Statistical Package for the Social Sciences
TBL	Triple Bottom Line
TLI	Tucker-Lewis Index
VBN	The Value Belief Norm theory of environmentalism

1 INTRODUCTION

Managers in the high-tech industry do not currently have the means to track how their consumers experience their brand with regard to eco-friendliness, and they do not even know if it is one of the criteria or dimensions of the brand that the consumers would think of when they encounter or come in contact with their brand. Measuring the effect of Environmental and Social Responsibility[1] (ESR) activities and the eco-friendliness of consumer brand experiences are calling for new ways of measuring to create comparable results. There are some initial attempts to do it, but the key issues of ESR frameworks, measurement, and empirical methods have not yet been resolved as research has been fragmented or focusing only on organizations and not studying individuals or groups of actors (Orlitzky *et al.*, 2011). So far, consumers' perception of a company's sustainability and eco-friendliness has not been measured on the brand experience level. The further development of brand experience measurement models is needed to move the brand management field toward a more pro-environmental direction. Eco-friendliness in the context of fast-moving goods (McDonald *et al.*, 2009), and automobiles (Kim, 2011) has been used as a selling point and it has also been studied more than in the case of consumer electronics or high-tech products (McDonald *et al.*, 2009) especially from the brand management and marketing angle. This dissertation focuses on this research gap and studies the way eco-friendliness can be measured in the brand experience of high-tech products.

1.1 Background

In the consumer markets, among the top trends there still are eco-friendliness, green consumerism and social responsibility (Chatterjee *et al.*, 2010, Aaker, 2011, Kotler, 2011, Ottman, 2011, Accenture and UN_Global_Compact, 2014) that are especially visible and most established in the fast-moving consumer goods sector (McDonald *et al.*, 2009), as well as in the automobile industry (Kim, 2011) and for house appliances the energy efficiency is critical (McDonald *et al.*, 2009). However, the aspect of eco-

[1] In the context of this study, instead of using the term Corporate Social Responsibility (CSR) the term Environmental and Social Responsibility (ESR) is used, as it very distinctly makes reference to pro-environmental initiatives in addition to societal initiatives. When referring to the term CSR it is often understood to also include many pro-environmental activities executed by the corporation, but it is not so self-evident.

friendliness has not yet been adopted visibly in the small consumer electronics, at least it has not been used as a selling point in the consumer product offerings and there are no green alternatives available on the market (McDonald *et al.*, 2009), even though nearly all of the industries have ESR activities that they also report as a part of their annual reports. For companies it is important to have a good reputation and one way to ensure this is to make sure that the company is complying with ESR requirements (Diamantopoulos *et al.*, 2003, Grimmer and Bingham, 2013), however, there is some discussion does this truly benefit the company also financially (McWilliams and Siegel, 2000, Eisingerich *et al.*, 2011). But in the future it may be one of the key selling points for some consumer groups that have been identified as green consumer segments (Ottman, 2011).

There is very little research in the way eco-friendliness could be included in brand measurement scales of consumer perceptions. Madrigal and Bousch (2008) have studied social responsibility as a dimension of brand personality, and have concluded that it is a unique brand personality dimension that can be conceptualized in terms of the brand's obligation to society. Sweetin et al. (2013) have researched consumers' willingness-to-punish corporate brands for corporate social irresponsibility.

The purpose of this dissertation is to investigate how the eco-friendliness dimension in the brand experience can be measured as part of the full brand experience. In this thesis, it is suggested that an existing brand experience scale could be extended in order to measure the eco-friendliness dimension and the extended brand experience measurement scale provides a tool with a new dimension for capturing consumers' views on the eco-friendliness of the brand experiences of high-tech products. The brand experience measurement needs an integrated theory or model that includes variables measuring consumers' perceptions of the eco-friendliness of brands. There are various separate theories on consumer behavior and pro-environmental behavior, as well as various angles to measuring brand perceptions, and the theories on pro-environmental behavior and consumer behavior support that at least some portion of consumers have values and dispositions that indicate that they would consider environmental aspects in a purchasing situation (Stern, 2000, Kotler, 2011, Ottman, 2011). In this study, the target has been to extend the brand experience conceptualization of Brakus et al. (2009) that incorporates a model for measuring brand experience with items on eco-friendliness to test how it reflects the eco-friendliness dimension in the brand experience. The brand experience scale has earlier also been extended in another research where the relational experience dimension was added (Skard *et al.*, 2011). Another aim of this study is to offer more evidence on the environmental and sustainable business practice considerations that need to be taken into account in the BBX scale.

There are number of reasons for studying the way eco-friendliness can be measured also in association with high-tech products in the context of brands. Firstly, current brand measures do not include a dimension for eco-friendliness in the brand experience.

Secondly, it should be taken into consideration that there are still very strong environmental and green trends in the consumer markets that indicate that there is still a growing market for eco-friendly products (Beinhocker *et al.*, 2009) even though it may have slowed down (Flatters and Willmott, 2009). And finally, eco-friendliness has not yet been seriously taken into consideration when targeting high-tech products and brands and when designing marketing messages to the consumers, even though, the automobile industry has already got a successful head start in this area (Kim, 2011).

This study is a replication research which is encouraged as it is necessary to test theories and constructs with multiple sets of data to establish generalizations (Madden *et al.*, 1995, Evanschitzky and Armstrong, 2013, Uncles and Kwok, 2013). More replication research has been demanded already for several decades (Reid *et al.*, 1981, Madden *et al.*, 1995, Armstrong, 2003, Mezias and Regnier, 2007, Evanschitzky and Armstrong, 2013, Hubbard and Lindsay, 2013b, Uncles and Kwok, 2013). There is also an extension to this study, which is also relevant as it helps to identify more empirical generalizations and even strategic principles (Hubbard and Lindsay, 2002, Armstrong, 2003).

Other researches have formulated unique concepts and measurements that have not been replicated and verified, for example, on the strength of consumers' emotional attachments to brands (Thomson *et al.*, 2005), on consumers' perceptions of the value of a durable good brand (Sweeney and Soutar, 2001), on hedonic and utilitarian dimensions of consumers' attitudes (Voss *et al.*, 2003), on brand attachment that describe the brand-self connections of the consumer (Park *et al.*, 2010). The approach in this study is different, and instead the aim has been to replicate and extend a scale that has been already tested and validated (Brakus *et al.*, 2009).

Consumers can have brand associations (Aaker, 1992, Keller, 1993, Aaker, 1996, French and Smith, 2013, Keller, 2013) and these can impact their brand experiences (Brakus *et al.*, 2009) as well as purchase decisions (Bettman *et al.*, 1998, Foxall and James, 2003, Foxall and Schrezenmaier, 2003, Foxall *et al.*, 2004) and both of these can contribute to brand loyalty (Brakus *et al.*, 2009, Romaniuk and Nenycz-Thiel, 2013). However, the dimensions in the measures that are used to capture the brand experiences of consumers do not at the moment capture the eco-friendliness aspect. Mostly, studies on developing consumer-level measurement scales for brands concentrate on such dimensions that measure concepts such as brand personality, brand image, brand attitude, brand attachment, brand love, brand authenticity, brand loyalty, brand trust, brand equity, brand involvement, and it is very rarely that any dimensions for eco-friendliness are included in the scales.

In order to be able to respond to the growing consumer needs for eco-friendliness also in other product categories than fast-moving goods, automobiles and home appliances (McDonald *et al.*, 2009, Kim, 2011), the companies that manufacture consumer

electronics and high-tech products need to get a better understanding how their brands are being experienced by consumers at the moment. And for this they need a simple measure that is easy to administer and can be used periodically to track the experiences of consumers.

Several researches have already looked into the eco-friendliness in other aspects of the brand and marketing, for example, green brand equity (Chen, 2010) and green marketing (Ottman, 2011). The studies have also concentrated more on such product categories as fast-moving goods (McDonald *et al.*, 2009), and automobile industry (Kim, 2011), and the high-tech industry has not been researched as much (McDonald *et al.*, 2009), however, it is used as an example sometimes in course books (Mohr *et al.*, 2010, Keller, 2013). Often in the case of high-tech products, it is considered that the eco-friendliness is not a selling point (McDonald *et al.*, 2009) and thus, even though a company would have environmental initiatives they would not be used in the marketing material targeted to the consumers in a credible and understandable way (Moisander, 2007).

In the consumers' decision making process when they consider what products and services they wish to purchase they look at different attributes of the offerings, which can be the product or service quality (Rao and Monroe, 1989, Aaker and Jacobson, 2001, Lemke *et al.*, 2011, Strizhakova *et al.*, 2011), price (Rao and Monroe, 1989, Ainslie and Rossi, 1998, Foxall *et al.*, 2004), reputation of the company (Anghel *et al.*, 2011, Orlitzky *et al.*, 2011), and all of these can be linked with certain brands as brand associations (French and Smith, 2013, Koll and von Wallpach, 2014). The studies that have researched the way consumers use brands in their decision making process give some indication that these have different kinds of meanings and relevance at different stages of the purchasing process (Bettman *et al.*, 1998, Foxall and James, 2003, Foxall and Schrezenmaier, 2003, Foxall *et al.*, 2004).

The construct of brand experience has been discussed and theorized (Pine and Gilmore, 1998, Chattopadhyay and Laborie, 2005), however it has not been properly measured before the BBX scale. The dimensions in the BBX scale include the affective, sensory, behavioral, and intellectual dimensions. In the initial phases of the development of the scale, it also included a dimension for social aspects and a similar dimension has also been proposed to be added by Skard et al. (2011) with the name of relational experience. The fifth dimension in the BBX scale is considered to be the eco-friendliness dimension in this dissertation. Overall, in the brand management research, there is very little operationalization of the brand constructs including an aspect for eco-friendliness or social issues (Diamantopoulos *et al.*, 2003), even though there are several indications from other industrial sectors, that there are such aspects to brand satisfaction and brand loyalty that can be associated with eco-friendliness and green values (Chen *et al.*, 2006, Chen, 2010).

This dissertation contributes to marketing and brand management research particularly, by introducing an eco-friendly dimension in the BBX scale. Also this study concentrates on high-tech brands, an industrial sector, that has not been actively included in the discussions when considering green and eco-friendly aspects in brand management and brand building. In this study, the empirical part includes analysis of data on mobile phone brands, and there are comparisons made to the automobile industry that is further in the development of green products; both of the product categories can be considered to be familiar and everyday products to the vast majority of consumers (Alba and Hutchinson, 1987). However, now the mobile phone is turning into a product of the fast-cycle technical industries (Mohr *et al.*, 2010) which also means that it can be replaced more often than a car, so also references to the trends and green product development in the fast-moving goods industry are relevant and partly applicable to this study.

Based on the findings of the web survey conducted in this study, an extended version of the replicated brand experience measurement scale is proposed as a more comprehensive measurement tool for capturing consumers brand experiences, so that in addition to the four dimensions in the BBX scale (affective, behavioral, intellectual and sensory), there would be an eco-friendliness dimension. Although it was confirmed in this study, that the original BBX model can also be replicated with high-tech product brands such as mobile phone brands, the model including the extension for the eco-friendliness dimension yielded the best model fit results.

1.2 Purpose and Objectives of this Research

The focus in this research is to study whether consumers take into account eco-friendly aspects when reflecting on a high-tech brand, and more specifically, is the eco-friendliness dimension already included in an existing brand experience measurement scale and in the brand experience of high-tech brands. Brakus et al. (2009) have created a BBX scale to measure the extent to which four different dimensions, the intellectual, the affective, the sensory, and the behavioral, are associated with different global brands. However, they have not included any environmental aspects in the brand scale.

The main purpose of this study is to: 1) examine the construct of eco-friendliness in the brand experience, both the definitions and domain of the construct, and then argue and test that eco-friendliness is conceptually distinct from the other dimensions in the brand experience construct (Brakus *et al.*, 2009); 2) develop and test an extended BBX scale including the eco-friendliness dimension, as well as demonstrate with empirical data that the eco-friendliness dimension is distinct from the other brand experience dimensions; 3) demonstrate that the extended BBX scale can be used to assess how consumers experience different brands also on the eco-friendliness dimension.

The need for conducting research in this area stems from the fact that high-tech companies are facing the need to perform deeper analysis of how consumers view the eco-friendliness of their brands, in order to create green product and marketing strategies that also benefit the financial performance of the company (Siegel, 2009). It has also been noted in literature, that research in green consumers' purchase decisions in the case of technology products has been very limited (Young *et al.*, 2010). The relevance of this research to companies comes from the fact that brands can also be considered to be assets for an organization, and the value of brands can even surmount the value of physical assets and resources and thus creating brand equity for the company (Keller, 2013), and similarly as other assets brands can degenerate if their constant maintenance is overlooked and if no investments are done to sustain their differential advantage compared to competitors' brands (Baker and Hart, 2007). The most significant benefit for a company investing in branding is the positive return financially and the value on the stock markets, as strong brands bring value to the shareholders by earning them higher returns than other brands in the overall market (Mohr *et al.*, 2010). Brand equity is actualized when consumers are so familiar with a brand that they have favorable, strong and unique brand associations with that specific brand (Aaker, 1992, Keller, 1993, Aaker, 1996, Keller, 2013). One of the reasons why brand equity exists is that brands add utility and value to the consumer's decision and consumption experience, and trust is the key value that a brand has for consumers (Delgado-Ballester *et al.*, 2003).

Postmodern consumers may be demonstrating against big corporate values (Flatters and Willmott, 2009, Nicholls, 2010) but at the same time there are some established global brands that have become very valuable and are appreciated by consumers (Aaker and Joachimsthaler, 1999, Keller, 2013). It is still through brands that people experience and express themselves in the social world (Holt, 2002). Market and brand management research tackles the problem how a brand's success and consumers' brand perceptions should be measured, but the actual measurement of the environmental consciousness of consumers in association with brands has not been theoretically grounded (Diamantopoulos *et al.*, 2003). General environmental attitudes have been studied more than environmental attitudes in the context of brand experiences, and hypotheses on green consumers have been developed with the attempt of linking measures of environmental consciousness with socio-demographic variables, but it is no longer sufficient in the profiling of green consumers (Diamantopoulos *et al.*, 2003, Haanpaa, 2007). There is a need to find other ways of measuring consumers' views on eco-friendliness and their possible response to the ESR related activities and communication of companies. This research offers eco-friendliness measures that are designed in line with and added to the attested BBX scale.

The interaction of the brand and the consumer's experience may also be bi-directional: a consumer experience influences greatly the consumer's overall perception of the brand, and when studying brand equity and customer equity, there is some indication that they

may influence each other (Verhoef *et al*., 2009). To build and manage brand equity the companies need to understand what the brand knowledge structures of consumers look like today and what is the aspiration for the future (Keller, 2013). Marketers would like to get a mental map of what is going in the minds of consumers, including thoughts, feelings, beliefs and attitudes of a brand, to be able to position the brand, however the measurement is currently not easy (Keller, 2013).

Another reason why this study was done is that it is important to have conducted differentiated replication research with multiple sets of data in order to establish empirical generalizations (Uncles and Kwok, 2013), and also in many research papers replications are encouraged (Madden *et al.*, 1995, Evanschitzky and Armstrong, 2013). The process of developing theories is time-consuming (Christensen and Carlile, 2009) and requires many studies, including replication studies that have an impact on the building of the theory (Mezias and Regnier, 2007, Hubbard and Lindsay, 2013b). Replication-with-extension research is called for, as it enables the identification of empirical generalizations which can even lead to strategic principles, instead of research focusing on finding original and new concepts that lead to isolated studies (Hubbard and Lindsay, 2002, Armstrong, 2003). More replication research has been demanded already for several decades (e.g. Reid *et al.*, 1981, Madden *et al.*, 1995, Armstrong, 2003, Mezias and Regnier, 2007, Evanschitzky and Armstrong, 2013, Hubbard and Lindsay, 2013b, Uncles and Kwok, 2013).

However, even though replications are needed to develop theories, they are not appreciated by researchers in the fields of business research and social sciences (Madden *et al.*, 1995, Easley *et al.*, 2000, Hubbard and Lindsay, 2013b), while in natural sciences replication research is considered to be a necessary part of the research process (Hubbard and Armstrong, 1994). Replication research done so far in consumer behavior, marketing and advertising are mainly on measurements, advertising and in the retail context: e.g. measurement of brand relevance across categories (Fischer *et al.*, 2010), measurement of service quality (Brady *et al.*, 2002), measurement of the impact of consumer cosmopolitanism on consumption behavior, i.e. the CYMYC scale (Riefler and Diamantopoulos, 2009), information-content in TV advertisements (Stern and Resnik, 1991), advertising effectiveness (Baack *et al.*, 2008), memory interference in advertising (Kumar and Krishnan, 2004), relationships of sales personnel with buyers (Boles *et al.*, 2000), and also in a few other studies in the retail context (Brooks *et al.*, 2008). There are also new studies emerging on the methodologies of doing replication research on the reproducibility as well as sampling and inferences in the case of consumer research (Nielsen and Seay, 2014, Peterson and Merunka, 2014).

The importance of research findings can be rated by the following criteria: replication, validity and usefulness (Armstrong, 2003). Hubbard and Lindsay (2013a) refer to the concept of significant sameness, which means that a research replicates an earlier result with success, however, also the result of not attaining a similar result is a valuable

finding that is necessary for the development of useful theories (Hubbard and Lindsay, 2013b). Doing replication research is a means for finding generalizations as external validity and construct validity need to be verified by replication (Armstrong, 2003, Hubbard and Lindsay, 2013b). In the case of conceptual replications, a conceptual framework from a previous study is used but the procedures and independent variables may be different from the original study (Raman, 1994). Replication research is not always considered to be necessary for testing theories, but it is considered to be necessary still for confirming same effect sizes by repeating an experiment or finding a result that supports the conclusion reached already by someone else (Rossiter, 2003).

This study is a replication that has been extended to test the applicability and usefulness of the BBX scale in the case of high-tech brands. This study being a replication of an earlier research is valuable as such also, as it is not sufficient that a topic like the measurement of brand experiences is researched in a single study with hardly any replication with other samples, and it can be stated that examining the possible sameness of a concept with an extended replication research allows to do more reliable generalizations (Easley *et al.*, 2000, Evanschitzky and Armstrong, 2013). Also, in literature, the need for more research in the constructs of environmental consciousness has been stated (Diamantopoulos *et al.*, 2003).

1.3 Positioning and Focus of the Research

The research and development of a brand experience measurement scale including eco-friendly items is an interdisciplinary research topic covering the following areas within consumer research and marketing research: consumer behavior, brand management, sustainability and ESR activities in companies as well as green marketing. The focus is on how the development of a brand experience measurement scale needs to also take into account the ESR activities performed by the companies on the markets, how the consumers perceive those activities and how this is reflected in the way the consumers appraise the brands, and finally how the ESR activities are experienced by the consumers on the brand level in a possible eco-friendliness dimension. Even though this research is in the area of consumer research, the brand-related findings can be used in many areas, such as brand management, strategic management, marketing research, and business development.

The theoretical background of this dissertation is based in consumer behavior research and brand management research and the way consumer perceptions can be measured by companies in the high-tech markets. As the focus in this research is on the high-tech industry, there are also references to studies in the field of marketing of high-tech products and innovations. The contribution of this research paper is focused on the way high-tech companies can conduct their brand experience measurement and how to construct a scale including items that measure how eco-friendly different brands are experienced to be by consumers. So far, the eco-friendliness of brand experiences has

not been included in the brand experience measurement scales. Environmental aspects and green brands have been studied as separate research areas, but the eco-friendliness as a dimension of the brand experience of a high-tech brand has not been studied before.

It is crucial for companies to get information on how consumers react to their ESR and sustainability strategies and activities. At the moment, companies do not have straightforward and tested ways to measure and monitor consumers' reactions to the eco-friendliness of a brand experience. Before the research of Brakus et al. (2009), a conceptualization and scale for measuring brand experiences had not yet been developed. The findings of this research support the use of the BBX scale in companies that are developing their environmental strategies to follow up how consumers perceive the ESR development activities of companies and experience them on the brand level. The focus in this study is on private-sphere environmental behavior that has a small direct impact on the environment on the individual level and a significant impact when a larger group collectively acts in the same manner.

1.4 Measuring Eco-Friendliness in the Brand Experience

When the demand and supply of eco-friendly products increases on the markets, it is important to understand what consumers expect of the products and how they perceive them with respect to their personal sustainable consumption habits. There are already some tools to capture the customers' and consumers' mindsets related to brand experiences, however, there are no robust tools and scales to create comparable results for tracking the consumers' experiences of the eco-friendliness of brands. Madrigal and Boush (2008) have studied social responsibility as a dimension of brand personality, and they consider social responsibility to be a unique dimension of brand personality that can be conceptualized by the brand's obligation to society. Also, Menon and Menon (1997) have suggested that corporate reputation and a positive brand image can be the result of consumers' brand associations, also including eco-friendliness, and they refer to contemporary statistics that were already then indicating the growing consumer awareness of environmental issues and willingness to reward companies that are environmentally responsible. Sweetin et al. (2013) have studied consumers' willingness-to-punish corporate brands for corporate social irresponsibility, and according to their findings it is more probable that consumers dealing with socially irresponsible corporate brands will punish than reward the brand when compared to consumers who are dealing with brands that are not irresponsible.

In their research Brakus et al. (2009) have conceptualized the brand experience with four explicitly defined dimensions: the sensory, affective, intellectual, and behavioral dimensions. The four-dimensional BBX is the only brand experience measurement scale that has a theoretical basis and has been empirically tested (Skard *et al.*, 2011). The BBX scale measures sensations, feelings, cognitions, and behavioral responses to brand-related stimuli. For example, the following aspects can be considered to be brand

stimuli: communications, design and identity of the brand, packaging, and sales environments (Brakus *et al.*, 2009). The BBX scale is practical and helps to evaluate how the brand experiences relate to other consumer responses, and it shows multi-dimensionally the components of the total consumer experience, however, the brand experience scale does not include an eco-friendly dimension.

The brand experience measurement model of this research is based on the original BBX scale, and it has been extended with a set of items on how an environmental aspect could be included in the brand experience measurement scale. This study includes the design and testing of two extended models including environmental items for each of the original four dimensions of the BBX scale. The conceptualization of the brand experience and the BBX scale has been tested with three different constructs in this study, two of which include items on eco-friendliness. In this study, the reference to the work of Brakus et al. (2009) is strong due to the fact that the ground work and testing of the their BBX scale has been done rigorously, and the items that they have selected in their final version of the BBX scale have gone through careful scrutiny.

1.5 Conceptual Model and Research Questions

The conceptual model and research questions of this dissertation have been formed on the basis of general research on consumer and customer experiences (Bettman and Park, 1980, Zukin and Maguire, 2004, Zarantonello and Schmitt, 2010), sustainable consumption and green consumer research (McDonald *et al.*, 2009, Young *et al.*, 2010, Ottman, 2011) and the research done by Brakus et al. (2009) on measuring brand experience and how it affects loyalty. In the model used in this research, the original BBX scale has been used as a basis of the measuring brand experience, but it has also been extended with a set of items measuring how consumers perceive environmental aspects in the brand experience.

The initial references to brand experience are from Pine and Gilmore (1998) who have introduced the concept of experience economy that treats experiences as the offerings being sold to consumers, also Schmitt (1999) refers to brand experience in his article on experiential marketing where brand experience is described as a combination of sensory, affective and cognitive associations. Chattopadhyay and Laborie (2005) created a tool for marketers to identify critical consumer contact points with brands so that they can deliver a brand experience to consumers in these consumer encounters.

In the actual conceptualization of the consumer experiences earlier research has mainly concentrated on the utilitarian product attributes and product experiences (Hoch, 2002, Lemke *et al.*, 2011), instead of brand experiences, and the promoters of experience management tend to advocate more emotions and sensations (Skard *et al.*, 2011). Even though consumers are displayed product attributes that are utilitarian when they shop and consume brands, they are also in contact with other brand-related stimuli that can be

subjective and the responses are internal to the stimuli, e.g. certain sensations, feelings and perceptions as well as behavioral responses (Fournier, 1998). The brand experiences can have varying strength and intensity, as well as valence, i.e. they can be positive or negative (Skard *et al.*, 2011). Also brand experiences can be short in duration or last longer periods, and when they are longer they are stored in the memory of the consumer and can thus have an impact on the consumer satisfaction and loyalty (Brakus *et al.*, 2009).

The original items in the BBX scale are divided into four different dimensions, and for this study for each of the dimensions also an environmental item was designed and tested. The dimensions in the BBX scale are: sensory, affective, intellectual, behavioral. Brakus et al. (2009) set out to identify the dimensions of brand experience that are similar to the big five dimensions identified by Aaker (1997) for brand personality, by looking at consumer and marketing research which concentrates on the way experiences happen and how they impact the consumer behavior e.g. in the form of judgments and attitudes when they search, shop, consume products, or get service.

Experiences occur in different kinds of situations and environments, either when consumers select, purchase or consume products, or they can also arise indirectly when consumers are in contact with advertisements, communications (Brakus *et al.*, 2009) content on the internet, etc. (Peterson *et al.*, 1997). There are also product experiences that are direct when the product is available physically (Hoch, 2002), or indirect when the product is introduced virtually in an advertisement. Shopping and service experiences are created in the physical environment in stores when a consumer is in contact with the workforce and practices of the company representing the brand. Experiences also arise when products are consumed and used on multiple dimensions by consumers (Holt, 1995), and they include feelings (Richins, 1997), imaginary settings and fun activities (Pine and Gilmore, 1998).

When determining the actual items for the BBX scale, Brakus et al. (2009) did a broader search, and did not resort to existing scales in psychology, but instead selected items that focus on the degree to which the consumers have sensory, affective, intellectual, behavioral or social experiences with a brand, and not the actual content of the experience. In their further studies, the scale was refined by exploratory and confirmatory factor analyses they determined the dimensionality of the scale. As both the affective and social items loaded on the same factor, the social dimension was considered to have strong emotional aspects, and for the final version of the BBX scale the number of items was reduced to 12 and the number of dimensions to four thus omitting the social dimension totally from the scale. As there is no reference to the social or environmental aspects left, this study returned back the social context with a more tangible reference to the environmental issues and concerns that have been a growing trend in the consumer markets. The dimension of eco-friendliness was

constructed on the basis of the four dimensions that were attested to be in the BBX scale.

The research questions have been formulated so that they test the hypotheses in this research with a positivist approach, and thus the responses are either affirmative or negative. However, there is also qualitative analysis on the degree to which the models actually fit the data, which is included in the discussion section of this thesis. This thesis investigates the following research questions:

1) Can the original four-factor BBX model be replicated with a data set on high-tech brands collected from Finland?
2) Is the eco-friendliness dimension embedded in the four-factor BBX model?
3) Is the eco-friendliness dimension a separate fifth dimension requiring that the original four-factor model is extended into a five-factor model?

1.6 Research Design

This research belongs to the domain of quantitative research and it concentrates on testing, replicating and developing further a model created in an earlier research. The research methods follow a positivist approach according to which the methodology is experimental. The research questions are stated in propositional form and they are empirically tested in order to verify them (Guba and Lincoln, 1994).

The data collection method in this research is a web survey, and the quantitative analysis methods include Structural Equation Modelling (SEM) with Principle Component Analysis (PCA) and Confirmatory Factor Analysis (CFA). The research method replicates the research methods used by Brakus et al. (2009) in their research on the measurement of brand experience. A replication research designates the importance of the first study and by a successful replication of the first research value is added to the research result and it can also be considered to be a measure of the quality of the output of both of the researches (Evanschitzky and Armstrong, 2013). The form of replication in this research is partly a rather close replication of a model construct created earlier by Brakus et al. (2009) and partly a differentiated replication as there is some deliberate variation in the conceptual and substantive domain of research (Uncles and Kwok, 2013), however, the data set is totally different than in the earlier research of Brakus et al.

1.7 Structure of this Dissertation

In chapter 2, where the theoretical framework is presented, the sections proceed according to the focus of this paper based on the positioning of this research, starting with consumer markets, eco-friendliness as a trend on the high-tech consumer markets, and then concentrating on consumers and their decision making processes. Then we will

have a closer look at brands and brand measurement methods, starting by the meaning of brands to consumers, and what kind of brand constructs already have measurement scales developed for them. We will also be looking at how brands are taken into account in the decision making process of consumers, and what kind of a role does eco-friendliness have as a criterion for selecting brands. And to conclude this section, there is a synthesis on how eco-friendliness can be taken into account when measuring brand experiences.

In the third chapter, the conceptual modelling and research questions are formulated in more detail, also the research design, methods of analysis and measurement model are presented. Chapter 4 presents the results of this study. In chapter 5, the model fit as well as the reliability and validity of the findings are covered. And finally chapter 6 focuses on the theoretical contribution and the limitations of this research, and presents some suggestions for future research.

2 THEORETICAL FRAMEWORK

This research focuses on the development of a BBX scale including an eco-friendliness dimension. In order to fully understand what is the scope of the research there is a need to look at the phenomena that are being measured and researched in the realm of consumer behavior, brand management, sustainability and ESR activities in companies as well as brand related measurement on the consumer level generally. An interdisciplinary approach is required due to the fact that the target behavior of individual consumers needs to be identified from a consumer market and environmental perspective and also the companies' environmental activities need to be understood in terms of their impact. It is necessary to gather insights from various fields of research, including behavioral and social sciences, as the causal variables interacting in the consumer behavior processes are studied in several disciplines.

This chapter concentrates on describing some of the main findings in research literature covering consumer markets, trends in the markets, consumer behavior in purchasing situations, consumer and brand experiences, brand measurements and measuring eco-friendliness in the brand experience. The conceptualization of the eco-friendliness aspect in the brand experience and the BBX scale has been tested in two different ways in this study.

2.1 Consumer Markets and Consumers

2.1.1 Consumer Markets

The competitiveness of the globalized consumer markets has forced companies to target their products outside of the national markets as well and thus companies are required to comprehend and acknowledge the needs and values of the consumers (Ter Hofstede *et al.*, 1999). Due to globalization consumer behavior can consist of commonalities that are not dependent on the nationality of the people which has helped global brands to spread across many nations, and this is the situation especially in the case of high-tech products such as consumer electronics, cars, and home appliances (Ter Hofstede *et al.*, 1999). Globalization of business and internationalization of companies has resulted in tighter competition on the domestic and global markets due to the increasing availability of global brands and consumers being able to choose from a wide range of purchase options (Netemeyer *et al.*, 2004) also via the internet (Widing and Talarzyk, 1993, Klein, 1998). Marketers are therefore concerned that useful, reliable and valid measures

are developed for evaluating consumers' attitudes and preferences for products (Netemeyer *et al.*, 2004).

A market segment is a set of consumers and product users with analogous needs that differ from the needs of another user group on the market (Hawkins and Mothersbaugh, 2010, Johnson *et al.*, 2011). Market segmentation analysis needs to be implemented regularly for current products on the market, as the demand for consumer goods fluctuates based on consumer needs (Hawkins and Mothersbaugh, 2010, Johnson *et al.*, 2011). The consumer markets are continuously changing due to the changing needs of consumers that are influenced by 1) external influences coming from e.g. the culture, demographics, social groups, 2) internal influences such as individual motives, emotions, and lifestyles of consumers, 3) situational influences and 4) the decision making process that varies per consumer depending on what criteria they have and how loyal they are to brands (Hawkins and Mothersbaugh, 2010).

A product from the buyer and consumer perspective is a mixture of capabilities, consisting of the utilities of the goods, services and ideas, that will bring satisfaction to the consumer, so that the benefits are favorable compared to the costs of the product (Enis and Roering, 1980, Levitt, 1980, Murphy and Enis, 1986). Product markets are knowledge structures that are socially constructed, and they are shared and used as places for interaction by consumers and producers, which means that the markets are not led by producers nor consumers but instead they evolve based on the feedback between the two parties (Rosa *et al.*, 1999). When new product markets emerge they are unstable and fragmentary as product standards and uses of products are still being developed, and as the markets mature they become more consistent as consumers and producers start to understand each other and the product categories stabilize on the markets (Rosa *et al.*, 1999, Mohr *et al.*, 2010). A product is more than its objective physical features, it is a combination of all different attributes contributing to its existence on the markets, including for example, channel distribution, promotion, pricing, and perceived competitors' products (Winzar, 1992).

It is difficult to categorize products very distinctly as consumers behave in different ways and the same individual may change their behavior during different times (Winzar, 1992). Product categories can be considered to be fuzzy sets when discussing and measuring how consumers perceive products and their attributes (Winzar, 1992), no one classification method can fully account for the differences, for example, in consumer acquisition behavior (Lastovicka, 1979).

One very traditional way to classify products in marketing is to divide them according to how the consumer goods are perceived, bought and consumed, and consumers' buying habits, into such categories as shopping, convenience, and specialty goods, as was done by Copeland already in 1923. This classification that is also referred to as the commodity school of thought (Winzar, 1992) is still valid according to many studies,

and it is the starting point for many studies referring to the classification of goods (Murphy and Enis, 1986). According to this classification, the main considerations for planning sales and advertising is to decide whether the consumers purchase the goods in a normal shopping situation, or at a convenience location, or is there some special brand preference in the situation (Copeland, 1923).

The product classes in Copeland's classification differ in the following way: 1) convenience goods are bought often, immediately and with small effort and they require least effort and risk (such as, for example, pens and chocolate), 2) shopping goods require a selection and purchase process where the consumer compares attributes, product quality, price and style (including smaller high-tech products such as TVs and PCs), 3) specialty goods require a special effort in the purchasing and selection process (for example, cars) (Murphy and Enis, 1986). For specialty goods the brand is considered to be distinctly in the mind of the consumer according to Copeland (1923), which makes his study one of the first to make reference to the construct of brand loyalty (Fournier and Yao, 1997) even though he does not name it so in his research, instead the "*recognition of a known brand*" is referred to. An additional product class added to Copeland's classification by Holbrook and Howard (1977) is preference products that require more effort and have more risk associated with them than convenience goods, but they still require little effort to purchase, and these are often branded products that the consumers prefer compared to a similar product with a different brand name (Enis and Roering, 1980, Murphy and Enis, 1986). Some products and brands are only bought for entertainment purposes, or in special contexts, so a convenience good may become actually a preference good in some circumstances (Winzar, 1992).

Copeland's classification of products has been criticized as being an outdated product classification theory because it has been insensitive to the changing markets and it does not take into account that modern consumers in their decision making process and purchasing behavior are increasingly more interested in the style, personal identity and status of the products and brands (Mason, 2005). However, the product classification theory of Copeland is still advocated by both the American Marketing Association and the UK Chartered Institute of Marketing (Mason, 2005). Another critical view on the commodity classification of products is that it focuses on the objects of the transactions and does not take into account the vast differences in products, markets and consumers, nor does it take into account that consumer responses are context-specific (Winzar, 1992).

A more recent product classification theory was introduced by Nelson (1970, 1974) who classified goods according to the way consumers find information on the goods in the purchasing situation, and products were divided into search and experience goods. A search good is a product that the consumer has the possibility to get information on all of the main product features before the actual purchase, while an experience good is

something that the consumer either cannot get all the information on the main features of the product without having the possibility to experience it, so the evaluation is done after the purchase, or then the information on the main features is harder and more expensive to acquire than experiencing the product personally (Nelson, 1974, Klein, 1998). To this classification Darby and Karni (1973) have also added a third class called credence goods which cannot be evaluated in normal use, instead the evaluation is expensive, and it can also be associated with the repair of a good, and it may be expensive to evaluate the credence good even after the purchase. The classification of products into search, experience and credence products is considered to be a good way to analyze also consumers' buying behavior (Nelson, 1970, Ford *et al.*, 1990, Klein, 1998, Korgaonkar *et al.*, 2006). This classification of goods can also be used when modelling consumer information search so that information economics and the goods classification are combined (Klein, 1998).

The experience or credence features of a product or brand are usually not acknowledged with confidence before the purchase, however, consumers may have a 'virtual experience' of a product or brand (Klein, 1998). Conceptually this would mean that a marketer could turn an experience good into a search good as the consumers get information on the experience good virtually over the internet before actually purchasing the product (Klein, 1998). The classification of goods in to search and experience goods is very relevant in the context of this thesis, as the brand experience is very much also a virtual experience (Klein, 1998) in addition to being something that a consumer may have experienced in reality as well.

According to Klein (1998) in the age of the internet, experience goods have become search goods in three ways: 1) the search of information on goods is less expensive and easier in the age of the internet than before, and there can even be user or brand communities with discussion groups sharing experiences on the products; 2) the way product information is presented on the internet may change the features that consumers consider to be the most critical ones in the decision making process; 3) consumers may have the possibility to e.g. download trial software from a site, or have the possibility to simulate an experience online. High-tech products can be considered to be at the same time experience and search goods as they are not purchased as often and more information is needed and searched before the actual purchase.

A third way to classify products is to do it based on the amount of involvement, value and personal relevance a consumer gives to a product, brand or an advertisement (Mitchell, 1979, Greenwald and Leavitt, 1984, Rothschild, 1984). The consumers' involvement is provoked by designing relevant advertisements that motivate or affect personally the consumers (Zaichkowsky, 1985). In the case of low involvement products, the purchasing requires the consumer to take very little risks, as is the case when a consumer purchases cleaning products, coffee, or bubble bath, on the other hand in the case of high involvement products there are more risks involved in the

purchasing, such as in the case of, for example, consumer electronics and automobiles (Zaichkowsky, 1985, Young *et al.*, 2010).

One way the high-tech industry can be distinguished from the rest of the industry sectors is that it has high levels of R&D expenditure and among the employees there is great number of scientists and engineers (Chakrabarti, 1991). The high-tech industries are divided into sub-categories according to the market and use of the products: equipment, consumer durable, non-durable, and intermediate products (Chakrabarti, 1991). High-tech products are usually the latest advanced technological solutions that have been designed and developed with latest innovative products or manufacturing processes, which also means that the definition of high-tech solutions can change over time (Mohr *et al.*, 2010). Today high-tech solutions designed for consumers include, for example, IT, computer hardware, software, telecommunications, internet infrastructure, consumer electronics devices, but in addition, there are also solutions from, for example, the biotechnology, medical equipment, nanotechnology, energy and green building technology industries that are targeted to business customers (Mohr *et al.*, 2010). Fast-cycle technical industries are often based on a technology that includes a speedily depreciating resource, e.g. Sony was challenged in the video game industry by Microsoft's Xbox and the Nintendo Wii, however, for none of these products the positions are necessarily long-term (Mohr et al., 2010). Similar evolution is also taking place in the computer hardware and software industries (Mohr et al., 2010).

Research on product classes concentrate on the relevance of the product compared to the needs and values of consumers, while research on purchase decisions focuses on the relevance of decisions and whether the consumer is motivated to do thoughtful purchase decisions (Zaichkowsky, 1985, Zaichkowsky, 1986). While both of these research streams are different, for both of these research streams high involvement is equivalent to personal relevance (Greenwald and Leavitt, 1984, Zaichkowsky, 1985).

2.1.2 Eco-friendliness – Growing Trend also in High-Tech Consumer Markets

2.1.2.1 Green Consumer Trends

Among the listed consumer trends that could influence consumer goods industry in the 2010's, green consumerism and eco-friendliness still have a high position (Chatterjee *et al.*, 2010, Aaker, 2011, Kotler, 2011, Ottman, 2011, Accenture and UN_Global_Compact, 2014). In a recent survey in 2014 by UN Global Compact and Accenture, in North America 21% of the respondents reported they consider sustainability when selecting products and services, the corresponding figure for Europe being 27%, for Asia one-third, while environmental awareness was highest in Africa and Latin America with 39%. (Accenture and UN_Global_Compact, 2014). Another related trend is the ethical concern of consumers, as among ethical consumers in the

U.K. fair trade has been one of the most important issues of ethical concern in consumer behavior when compared with environmental issues (Shaw and Clarke, 1999, De Pelsmacker *et al.*, 2005b). Ethical consumers are not only concerned about general environmental issues but also about the issues of the Third World (Shaw and Clarke, 1999).

Green consumer trends have also to some extent affected brand choices among the consumers, and as a result, for example, automobile companies and stores selling packaged goods have modified their operations and offerings accordingly (Aaker, 2011). Based on literature on green consumption, it can be stated that green consumption appeals more to females, the well-educated, people with children under the age of 18, and people identifying to the life style of an environmentalist (Elliott, 2013). When researching the psychological correlates of pro-environmental behavior, environmental psychology has concentrated on the demographic and social-psychological characteristics of consumers, however, Markowitz et al. (2012) have investigated the relations between personality traits and pro-environmental actions. Instead of socio-demographic traits, they found that high levels of aesthetic appreciation, creativity, and inquisitiveness are associated with altruism and these features motivate to perform in a pro-environmental way (Markowitz *et al.*, 2012).

Currently, there is a prevalent trend in society and among consumers according to which businesses are expected to act both in socially and environmentally responsible ways to help alleviate some pressing global problems and the majority of companies have set up their own ESR agendas (Orlitzky *et al.*, 2011), however, there is also a view that their responsibility is to drive green activities only if they complement the overall business strategy of the company and benefit the company profit-wise (Siegel, 2009). Market opportunities that are not served or are underserved need to be responded to by companies, for example, the green consumer trend has already enabled markets for such products as Prius automobile, bamboo fiber clothing, and off-grid green electricity generation (Clemons, 2008). Companies also give each other market signals indicating new motives and goals, and they are indirect means of communication on the markets and providing information to competitors on their moves that can help other companies in their strategy formulation (Porter, 1980), and today many high-tech companies are including more ESR activities in their strategies (Mohr *et al.*, 2010, Keller, 2013). All media, including social media, are increasingly alert and ready to report any news on energy and material waste, harmful chemicals and damage to the environment, which is why companies need to be responsible in their business, manufacturing, and distribution (Kotler, 2011). There are several industry-level watchdog groups that monitor and follow closely companies' marketing messages and how these messages are in line and consistent with the companies' actual ESR activities in order to verify that there is no greenwashing being done (Mohr *et al.*, 2010).

This has forced companies to reconsider and expand their business strategies and develop new ways of measuring success and having in addition to economic criteria, environmental and social criteria, c.f. the three P's: profits, planet, and people thinking (Kleindorfer *et al.*, 2005), an approach that has also been referred to as the triple bottom line (TBL) (Mohr *et al.*, 2010). The TBL approach was introduced in the 1990's as a new tool for measuring business performance and according to it the company should take into account in its performance measurements also how its performance is reflected in the local community and with a wider set of stakeholders than its direct transactional stakeholders (employees, suppliers and customers) (Norman and MacDonald, 2004, Hubbard, 2009). This has made the TBL a complex tool as it is not simple to quantify a company's social and environmental performance as they are unique to each industry and even company (Hubbard, 2009), and the tool's usefulness in practice has also been questioned as it can only help to report very vaguely the commitments of a company to social and environmental concerns (Norman and MacDonald, 2004). During the last decade, also green score cards, sustainability rankings and corporate social responsibility metrics have been taken into use by many companies for tracking their results, and also investors are now looking at sustainability performance as one indicator of business value (Kiron *et al.*, 2012). However, the metrics are missing a link to how the consumers perceive the ESR activities and improvements in association with the brands and consumers' brand experiences. In ideal cases, managers building green marketing campaigns would customize and target them based on the profiles of consumers who are most likely to purchase the product or services, which could improve both the effectiveness and the efficiency of the marketing efforts (Sun and Morwitz, 2010).

The findings of Chen (2010) in a research on green brand equity demonstrate that green brand image, green satisfaction, and green trust are positively related to green brand equity, which also suggests that investing in activities boosting the green brand image, green satisfaction, and green trust would also improve the green brand equity of a company. When companies target to improve their green brand equity it is recommended that they develop their green brand image, green satisfaction, and green trust in their environmental strategies (Chen, 2010). Kang and Hur (2012) have studied green constructs and their relationships in the case of electronics products in South Korea. They found that green brand satisfaction affects positively green trust, green affect, and green loyalty. Also the results indicate that green trust and green affect influence very positively on green brand loyalty and in turn green brand loyalty has a strong positive influence on green brand equity. Kang and Hur (2012) conclude that perceived green trust is created by eco-friendly attributes. The green affect associated with positive emotional consumption is important when building green loyalty and green brand equity (Kang and Hur, 2012). Kang and Hur (2012) propose as a result of their findings that green brand equity is affected positively if the companies invest in building the green brand–customer or brand-consumer relationship consisting of the

green satisfaction, green trust, green affect and green loyalty. Ng et al. (2014) have studied whether the successful promotion of a green brand image and value depend on the existing perceptions that consumers have on the brand quality and credibility. Their finding is that the perceived quality and credibility of a brand has significant influence on the way a green image is created, as well as the green perceived value and green brand equity in the case of electrical and electronic goods (Ng *et al.*, 2014).

2.1.2.2 Corporate and Company-level ESR Strategies

Environmental responsibility is becoming more important for all businesses (Mohr *et al.*, 2010). Especially high-tech businesses are now starting to lead in this area as they have a need to produce new innovative technologies that could help to solve current global problems, and they can more easily directly link business strategies to the ESR targets (Mohr *et al.*, 2010). This approach can thus also provide high-tech companies a better opportunity to differentiate with ESR actions than companies in other areas. The way high-tech companies are implementing ESR strategies include, for example, business strategies serving customers in base-of-the-pyramid markets and strategies ensuring access to technology for all levels in the society (Mohr *et al.*, 2010). It is strategically worthwhile for high-tech companies to have an ESR strategy, and have marketing in the companies adjusted to emerging trends affecting business, strategies and the profitability of the companies (Chen, 2010, Mohr *et al.*, 2010).

Pro-environmental reputation in itself is already considered to be a valuable resource (Russo and Fouts, 1997) that also helps to build brand equity (Chen, 2010). The environmental reputation needs to be built on top of a good reputation in quality (Russo and Fouts, 1997). Chen (2010) broadened the scope of brand equity research by adding the environmental aspect and introduced four new green constructs for depicting how consumers perceive products based on a survey done on information and electronics products in Taiwan. These constructs are: green brand equity and its drivers, green brand image, green satisfaction, and green trust. 'Green brand equity' has been defined by Chen (2010) as *"a set of brand assets and liabilities about green commitments and environmental concerns linked to a brand, its name and symbol that add to or subtract from the value provided by a product or service*."

The principle reason why corporations invest in driving and creating ESR strategies and initiatives is that green references and achievements are nowadays a prerequisite for maintaining and developing business and keeping a loyal customer base for the corporation's products and services (Diamantopoulos *et al.*, 2003, Grimmer and Bingham, 2013). It was commonly believed in research literature as well as in companies in the 1990's that better environmental performance will increase profits, as a good reputation for being environmentally responsible will improve sales with environmentally conscious customers and consumers (Russo and Fouts, 1997). Also the publishing of shopping guides for green consumers, rating programs and sites on the

internet started to increasingly influence the environmentally conscious consumers and their purchasing habits, as consumers started to get more information for making selections between products and companies (Russo and Fouts, 1997). If the brand's communication on the environmental performance of the company is clearly communicated, it is believed that consumers will start to truly see added value in the purchasing of green products (Grimmer and Bingham, 2013). The reason why companies would drive for sustainable competitive advantage can be listed shortly as strategic goals for engaging in ESR: increase market share, increase productivity, enhance human capital/worker quality, develop more favorable industry conditions and reduce actual as well as potential competition, increase share price (Siegel, 2009).

In the current global markets, as the appreciation of ESR strategies and activities has become increasingly important, the fact that a company can demonstrate that it has a green business will help the company to create and manage a positive brand image as an ESR company (Ottman, 2011). When a company starts to implement ESR activities is also needs to inform about them to the markets and especially the consumers, however, there is much to improve in the transparency of the environmental activities of companies, as consumers cannot easily find reliable corporate information on green and environmentally safe products and services (Ottman, 2011).

Many technology companies have already included in their agendas CSR strategies including ESR development activities, but they are not benefitting the companies financially at the moment (McWilliams and Siegel, 2000, McWilliams and Siegel, 2001, Siegel, 2009) as consumers are distrustful of these messages they get via media and the scarce CSR reports from the companies (Moisander, 2007). The role of eco-innovation is growing also in the high-tech industry (Mohr *et al.*, 2010) and consumers' expectations for eco-innovations in this area have increased, however, the eco-innovations in the high-tech industry are not yet all fully brought to the attention of consumers, only some automobile manufacturers (Kim, 2011, Keller, 2013) and high-tech companies (Mohr *et al.*, 2010, Keller, 2013) have already taken some steps in bringing forth greener marketing messages. There could be a competitive advantage in re-thinking the eco-friendly marketing messages, for example, the marketing campaigns of eco-innovations could be structured entirely differently than for other new products or services. No longer is it enough to be implementing environmentally responsible decisions within the company without informing about them to the consumers, as brand value results from the way consumers perceive the brands.

The main driver for companies to have an ESR strategy are the changes in society's values; consumers, customers, employees, suppliers, governments, NGOs and other stakeholders are demanding companies to place additional investments in ESR, however, the connection between ESR and the financial performance of a company is still unclear (McWilliams and Siegel, 2000). ESR initiatives are always investment decisions for a company, and companies cannot use green management logic only due

to pressure from the society (Siegel, 2009). Chen et al. (2006) found that the performance of green product and process innovation were positively correlated to the competitive advantage of a company. Also Grimmer and Bingham (2013) discovered in their study that there is a strong relationship between the perceived environmental performance of a company and consumers' purchase intentions. If the brand's public communication on the environmental performance of the company is clearly and credibly formulated, consumers will start to truly see added value in the purchasing of green products (Grimmer and Bingham, 2013). However, the study of McWilliams and Siegel (2000) suggests there is no financial impact from ESR related activities, but this may be a result of having created a measure for ESR activities based on a unique rating index created by one company.

A company should not even target significant returns for its ESR activities in a short period of time, it should be enough that the investments pay back according to a long-term plan and that the ESR activities can be perceived to be worthwhile in the business context and especially by the consumers. The assumption among consumers is that those companies who actively maintain ESR related activities are more reliable and also that the products they market are of higher quality, and there is also evidence that many consumers give credit to the ESR values and attributes in the products and services (McWilliams and Siegel, 2000). McWilliams and Siegel (2001) consider that there is an ideal level of CSR activities that can be determined by cost-benefit calculations. At this ideal level of CSR, profits will be maximized and the demand for CSR activities from multiple stakeholders is satisfied, and managers should form decisions on CSR related activities in the same way as they treat all investment decisions (McWilliams and Siegel, 2001).

Even though ESR activities no longer necessarily provide the companies any competitive advantage, and consumers have even become continuously more distrustful of what ESR actually stands for (Orlitzky *et al.*, 2011), when a company has ESR strategies and is implementing ESR activities, it helps the company to build a reputation of being reliable and honest, and consumers usually associate high quality products with a reliable and honest company (McWilliams and Siegel, 2001). ESR related activities may strengthen the firm's reputation and help increase consumers' brand loyalty (Siegel, 2009). Even though corporations have a profit-maximizing attitude to green management, there is still the possibility for them to plan and implement strategic initiatives that can at the same time achieve corporate-level and environmental objectives (Siegel, 2009).

2.1.2.3 High-Tech Companies in the Greening Consumer Markets

Consumers can be especially sensitive to the eco-friendliness of technology, even the concept of 'green technology' is questionable as high-tech products are full of electronics, wiring, and complex components which are not eco-friendly (Mohr *et al.*,

2010). Especially B2B customers in corporations are interested in the energy efficiency of the products they are considering to buy, as reducing operating expenses, including energy use, is one of the main targets, for example, when aiming at sustainable IT operations (Mohr *et al.*, 2010). This is one of the reasons why high-tech companies have been driving the energy efficiency of products for nearly 10 years already, for example, IBM launched their Smarter Planet campaign in November 2008 (Keller, 2013). The ESR activities driven by the company should also be applied on a strategic level to build positive brand associations in some main target markets and even allow the company to differentiate in that way from competitors (Mohr *et al.*, 2010) especially in the high-tech markets where it is not yet used as a selling point. It could even help to increase customer and consumer loyalty with reference to some product features even though not being directly associated with them (Chen, 2010, Mohr *et al.*, 2010).

As the high-tech environment is a constantly changing market, the companies need to be well aware of what is happening internally and externally in the environment and market. As the innovations are being generated with speed so are the trends in the brand environment changing rapidly which should also be reflected better in the brand strategies of companies (Keller, 2013). Technology companies need to build credibility in both their internal R&D departments as well as among their customers (Keller, 2013). Research in Motion (Blackberry), Motorola, and Nokia were formerly dominating the mobile phone markets, and now they have lost considerable market share to Apple's iPhone, because trends tend to change quickly in the mobile phone markets and the majority of consumers are now purchasing such brands as Apple's iPhone, Samsung, (IDC 2014). Also the less dominant brands are now trying to win market share in the mobile phone markets and they need to invest in earning the attention of consumers to their brand (Liberali *et al.*, 2013).

In the rapidly changing high-tech markets, a strong brand name is more vital than in the fast-moving consumer goods industry (Mohr *et al.*, 2010). So especially high-tech companies need to have well planned and heavily funded marketing campaigns to create a strong brand name and increase brand awareness among consumers and customers (Mohr *et al.*, 2010). When corporate images are linked with innovativeness and trustworthiness they have a more positive effect on the product evaluations of consumers especially in situations where the perceived risk associated with the purchase is high; in other words, branding can be considered to be especially crucial for high-tech products and innovations, and even more so for highly advanced new technological innovations (Mohr *et al.*, 2010). In the high-tech markets, not only does the product need to be good, also some additional, secondary signals or meanings are also required to build consumers' brand attitudes which can result more durable competitive advantages (Aaker and Jacobson, 2001, Keller, 2013). The creation of brands in the high-tech markets that change quickly and are uncertain requires thorough attention to the right kinds of strategies and tools used, and one of the strategies for building high-

tech brands mentioned by Mohr et al. (2010) is to include ESR into the strategy of the company.

Automobile companies have started to use sustainability strategies in creating stability for their business as they are facing such challenges as CO_2 emissions and consumer diversity, and they are using their strategies to get the support from society while also profiting from them, which is why sustainability will also continue to be a primary focus in the future designs of automobiles (Kim, 2011). Toyota's leadership in the hybrid technology has helped the company to clearly stand out from its competitors, and it has reached a top sales record for 19 consecutive months with its hybrid car, the Prius (Kim, 2011). Certain car brands like Toyota and Ford, and high-tech brands like Nokia and Sony have earlier also profiled as sustainable and green brands. In 2014, according to Interbrand's Best Global Green Brands report, the new #1 sustainable brand was Ford, and Toyota had fallen to #2 with Honda #3, Nissan #4, Panasonic #5, Nokia #6 and Sony #7 (Beltzer, 2014). Interbrand's Green Brands report examines the gap that exists between a brand's environmental performance and consumers' perceptions of that performance. Of the mobile phone brands in the focus of this study, the Nokia brand is at #6, Samsung #11, and Apple #21 in the report of Interbrand 2014 (Beltzer, 2014). There are also other brand rankings available, but what makes the ranking of Interbrand relevant is that it takes into account various rankings globally as it bases its ranking of the top 100 Brands on all rankings that are published around the world. The ranking of Interbrand has, however, been criticized by Bielenstein (2014) as it leaves out many relevant brands that have a good performance in the sustainability area. The methodology for reaching the ranking has also not been fully explained in Interbrand's report even though it is claimed that it is based on the sustainability performance and consumers' views of the brands (Bielenstein, 2014).

The research of Hartmann and Apaolaza-Ibanez (2012) suggests that advertising campaigns for green energy should not only use environmental concern and the utilitarian benefits of green energy, but in addition use psychological brand benefits in the campaigns. Their theoretical framework distinguishes three psychological benefit categories that would attract consumers to green energy brands and motivate them to do purchase choices in favor of those brands: 1) feelings of warm glow coming from the satisfaction of being able to support the common good of the environment, 2) self-expressive benefits from being able to consume visibly in an environmentally friendly way, and 3) nature experiences induced by images of using a natural brand (Hartmann and Apaolaza-Ibanez, 2012). It can be said that when one purchases green electricity on the individual level the utilitarian benefits are minimal, but when there is a collective movement toward the use of renewable energy there will also be such collective benefits as reducing global warming and energy dependency, and this is how the green energy brands can also offer psychological benefits to consumers (Hartmann and Apaolaza-Ibanez, 2012).

2.1.3 Consumers and Consumer Decision Making

2.1.3.1 Consumers

The term ‘consumer’ is generally used in marketing literature to refer to the end user or consumer of a good or service, but it is also used to refer to the purchaser or person making the purchase decision; the term ‘customer’, however, is generally only used to refer to the actual or potential purchaser of a good or service (American_Marketing_Association, 2015). In this thesis, only the term ‘consumer’ will be used as it is the consumers who are actually making the purchase decisions and use the product themselves or provide the product or service to another individual (e.g. a family member) for use. Literature does not always differentiate these terms, for example, Mohr et al. (2010) do not differentiate between the terms, and they consider consumption mostly only from the company’s perspective.

Consumer researchers have earlier concentrated on finding general consumer characteristics based on demographics and socio-economic status, however, as they have proved to be inadequate for predicting consumer behavior, the focus has moved to psycho-graphics and life style variables, and also including the experiential view (Holbrook and Hirschman, 1982). This line of research into experience consumption has also brought into attention different subcultures, and, for example, such experiential personality constructs as sensation seeking (Zuckerman *et al.*, 1978, Zuckerman and Kuhlman, 2000) where the focus is on consumers’ desire to find more complex entertainment and experiences, and creativity-, variety-, novelty-, and arousal-seeking related variables (Raju, 1980, Holbrook and Hirschman, 1982). The study of consumption as an experience requires rigorous methodology that is not be tied solely to overt behavioral measures, but also takes into account the cognitive aspects of the consumers (Holbrook and Hirschman, 1982).

Socio-demographic segmentation of consumers can be used when planning advertising campaigns, but there is also another kind of segmentation approach that is non-demographic which is required in the product planning and creation phase (Yankelovich and Meer, 2006). Yankelovich (1964) presented the concept of non-demographic consumer segmentation that could be used to classify consumers in other ways, as demographic marketing studies were no longer helping to predict and create feasible marketing strategies, instead it was considered that buying patterns would help to predict consumers’ future purchasing behavior more reliably. However, five decades later, the non-demographic segmentation of consumers has proven to be as ineffective a technique that only serves in planning advertisements (Yankelovich and Meer, 2006). The new approach for doing a broader non-demographic segmentation presented by Yankelovich and Meer (2006) includes elements of something they refer to as a ‘*smart segmentation strategy*’ including a tool for analyzing consumers’ behavior and the

‘*gravity of their decision spectrum’*, which indicates how important consumers consider a certain product or product category to be.

Based on the BBX scale, Zarantonello and Schmitt (2010) have created a typology of consumers and their experiential preferences, and how these preferences affect the consumers’ brand attitudes and purchase intentions. According to their classification that is based on the psychological attitudes of consumers and their experiences, there are five types of consumers: the hedonistic, the action-oriented, the holistic, the inner-directed and the utilitarian consumers. The relationship between brand attitudes and purchase intentions is the strongest among holistic consumers, while this relationship is the weakest for utilitarian consumers (Zarantonello and Schmitt, 2010). The holistic consumers are interested in all the aspects of experiences, while the utilitarian consumers are not so much interested in the experience as such; the hedonistic consumers appreciated sensorial and emotional experiences, and the action-oriented concentrate on the actions and behavioral aspects of the experiences, and the inner directed consumers concentrate on their internal processes for sensations, emotions and thoughts (Zarantonello and Schmitt, 2010). One could also categorize, for example, consumers that prefer sensory and affective experiences more than action-oriented experiences, and these could be even divided into so-called ‘low-experiential’ vs. ‘high-experiential’ consumers (Zarantonello and Schmitt, 2010). When it comes to high-tech consumers, it may be hard for new high-tech start-ups to define who their consumers are, and in the case of a new innovation there may be multiple industries and markets where it can be used and it is risky to select a primary customer or consumer (Mohr *et al.*, 2010).

One can consider there to be a brand value chain where the source of brand equity is generated in the consumers’ minds (Keller, 2013). To measure these sources of brand equity the brand manager has to thoroughly understand how consumers behave in purchasing situations, how they use products and services, and what consumers know, think, and feel about brands and how they experience different brands (Keller, 2013). Many corporations act as if solely producing good quality products and giving the company a good image for dependability is enough to gain consumers’ trust, but the findings of Delgado-Ballester et al. (2003) indicate that the quality of interpersonal relationships, such as trust, in the relationship between a brand and consumers indicates that the brand has characteristics that are additional to the mere product. The tendency of consumers is to search experiences that attract their emotions and dreams and in these situations brand-related stories can aid in creating the desired experiences, and when there are unique and appealing associations made it can also help to improve the consumer brand equity and add the consumers’ willingness to pay for the branded products (Lundqvist *et al.*, 2013).

2.1.3.2 Consumer Decision Making Process

If the economic theory of the consumer is used to describe or forecast consumer choices or consumer behavior, there will be systematic errors as consumers tend to act inconsistently with economic theory; economists have earlier paid less attention to the difference between normative models of consumer choice and on the other hand descriptive or positive models of consumer choice (Thaler, 1980). Kahneman and Tversky's prospect theory is based on research on judgement and decision making under uncertainty is an alternative descriptive model of economic behavior (Kahneman and Tversky, 1979). The formulation of the prospect theory is based on a survey research that was designed to indicate discrepancies between behavior and what was expected by the utility theory (Kahneman and Tversky, 1979). Especially the following consumer behavior cannot be predicted with the economic theory: search behavior, choosing not to do a selection, regret, and self-control of the consumer (Thaler, 1980).

Since the mid 1950's researchers have started to offer other theories of consumer purchase behavior in addition to the rational choice theory, one of these is the information processing approach which understands that consumers have limited capacity to process information, due to consumers' limited working memory and information processing capabilities (Bettman *et al.*, 1998). Bounded rationality and limited processing capacity are commonly understood to influence in all complex and new situations where people need to make a decision (Bettman *et al.*, 1998). Also consumers do not necessarily have well-defined preferences, and so they create preferences in different situations when they need to make a choice (Simon, 1990, Tversky and Kahneman, 1991, Bettman *et al.*, 1998). Consumers have clear preferences when the options are familiar and they have experiences of the choice, and in these situations the rational choice theory could be referred to, but even in these cases there may be context-related factors that can mix up the decision-making process and earlier preferences tend to be resorted to if they are easily accessible from the memory (Wright, 1975, Feldman and Lynch, 1988, Bettman *et al.*, 1998).

In consumer behavior research, there are numerous of complicated theories trying to describe and predict consumer behavior (Engel *et al.*, 1978, Bettman *et al.*, 1998). According to these theories, consumers make an effort to actively search and use information in order to make choices, which suggests that the consumer is rational and has a problem-solving approach and therefore stores and evaluates information and all inputs to be able to make a sensible decision (Zaichkowsky, 1985). There is some evidence from research done earlier that consumer behavior is mostly based on comprehensive analysis of the options, however, also it has been found that some consumers do not necessarily always search for information even before the purchase of major durable products, such as cars and bigger appliances (Olshavsky and Granbois, 1979). However, this research was done over three decades ago, and now with access to the internet people have information more readily available which has made the search

process easier than earlier, and some studies have indicated that the online environment has an impact on the way consumers search for information and perceive their relationships with products (Peterson *et al.*, 1997, Peterson and Merino, 2003). Consumers that are experts in a certain area will tend to search on the internet for information more frequently than ordinary consumers, because they are interested in more detailed product attributes or have special questions in mind related to specific usage situations, and so-called non-experts will tend to look for the opinions of other users before a purchase (Peterson and Merino, 2003). The availability of information and resorting to this information when making purchase decisions has an impact on consumers' purchasing behavior, even to the extent that it should also be taken into account on the corporate strategy level (Clemons, 2008). Usually consumers need to make numerous routine decisions daily, and in these everyday situations consumers do not necessarily make a conscious effort to seek and process information, which can be seen in theories so that there are distinctly two kinds of consumer behavior: the low involvement and high involvement consumer behavior (Zaichkowsky, 1985).

Social cognitive psychology accounts for choice by arguing that the consumer buys this or that brand because she prefers it, likes it, wants it or needs it, has a positive attitude toward it, or intends to purchase it (Foxall, 2007). There are three behaviorist theories that have been used to explain economic behavior of consumers and consumer choice: 1) radical behaviorism that avoids intentionality in its explanations; 2) teleological behaviorism that interprets complex behavior based on the consequences of the behavior; and 3) pico-economics that tries to explain why patterns are broken sometimes, for example, when the products are expensive and less frequently bought there may be a conflict between spending and saving (Foxall, 2007).

According to Punj and Stewart (1983), the consumer decision making process has been researched with three different approaches. The first approach tries to identify the elements of the tasks in the consumer choices that have an impact on the consumer decisions, and some researches in this area include, for example, the information presentation format (Bettman and Kakkar, 1977), the effect of the product class on the information acquisition strategies (Capon and Burke, 1980), and brand choice strategy dependency on the task complexity (Lussier and Olshavsky, 1979). The second approach aims to identify the individual differences that have an impact on the decision outcomes of consumers, for example, an individual's information processing ability and level of information complexity can have an effect on the processing accuracy (Henry, 1980), the effect of the individual consumer on the information acquisition strategies (Capon and Burke, 1980). And finally, the third approach concentrates on decomposing the consumer choice process into elementary components on the behavioral level, and see how the components are part of a constructive process, for example, consumers with a medium level of knowledge and experience process available information to a greater extent than knowledgeable consumers who have a tendency to process on a brand level (Bettman and Park, 1980), and due to limited processing capacity consumers do not

necessarily have well-defined preferences, instead they construct preferences based on the tasks required with different strategies (Bettman *et al.*, 1998).

The three approaches listed above have usually been used separately, however, Punj and Stewart (1983) have integrated them into one conceptual framework to create a so-called interaction framework of consumer decision making that takes into account all of the three approaches: tasks, individual differences as well as the interactions between tasks and differences. The use of an interaction framework has been also done earlier (Lewin, 1939, Ekehammar, 1974). The interactive approach to consumer decision making considers that 1) consumer behavior is a continuous process and there is multidirectional feedback between the consumer and the purchasing situation, 2) the consumer is a premeditating active individual in the process, 3) the cognitive considerations of the individual consumer have an effect on the behavior, even though emotions may also have an impact, and 4) the context of the purchasing situation also influences the consumer psychologically (Punj and Stewart, 1983). According to the interactionist approach the behavior of an individual consumer is influenced by the task and the individual himself, and the impact of experiences in the context are always interpreted by the individual (Punj and Stewart, 1983).

The kinds of knowledge structures consumers have affect the kind of information they process when making a decision on a choice; also the phase of the decision making process in which the consumer is affects the types of information that are referenced by the consumer at that stage (Bettman and Park, 1980). Some major features of consumer decision making are: 1) the selection depends on the goals of the consumer and how much the goals reduce the cognitive effort required and negative emotional experiences, and on the other hand increase the accuracy of the decision and the justification of the decision; 2) the selection depends on the complexity of the decision, and the superior options with reference to the most critical attribute are preferred when the task is complex; 3) the selection depends on the context, so that not only the attributes of one option are relevant but in addition the attributes of the other options are also impacting the selection; 4) the selection is dependent on the way the decision maker is requested to do the selection, and even though the methods of requesting for a selection are similar they may result in different decision outcomes; and 5) the selection is dependent on how the options are presented and displayed, and whether the outcome of the selection is framed as a gain or a loss, and a possible loss can impact a decision more than a corresponding gain (Bettman et al., 1998).

In the purchasing context there are many factors influencing the decision making process of the consumer: demographic, social, political, economic and psychological factors in addition to the domestic and daily practices on the individual level (Young *et al.*, 2010). When looking at the buyers of consumer goods, it is clear that individuals living as singles have different kinds of needs and purchasing habits than parents with children, also the demographic background of the buyer can influence how sensitive the

buyer is to the price, the eco-friendliness and other desired attributes of a product; such demographic features as family size, income, religion, gender, nationality, occupation, age, annual income, and level of education can have an effect on the kind of products and services the buyer is interested in (Hawkins and Mothersbaugh, 2010). Also such factors as lifestyle and self-image can affect the decision making process and purchasing behavior (Yankelovich and Meer, 2006) especially in the case of eco-friendly products (Ölander and Thogersen, 1995, Moisander, 2007, Phipps *et al.*, 2013).

The purchasing process starts when the consumer recognizes a need to solve a problem or an opportunity either by an internal or an external factor, for example, in the case of high-tech products an external factor may be an advertisement of a new technological solution, or the influence of another consumer's purchasing behavior (Mohr *et al.*, 2010). Consumers tend to repeat their purchase and consumption behavior and habits in familiar places, and when the consumer is not consciously making any decisions, the habitual behaviors are activated, and even if consumers may have other intentions the habitual behaviors take place when they have formed into strong habits (Ji and Wood, 2007). In the purchasing situations that require the least involvement the decisions are so-called nominal decisions where once the problem is identified, the long-term memory can bring to the consumer's mind the most preferred brand and once that brand is purchased there is only very minimal evaluation of the brand after the purchase (Hawkins and Mothersbaugh, 2010). Then as the consumer needs to be involved in a more extended decision making, there is also a need for more information that needs to be searched, and the consumer needs to figure out what are the options more thoroughly, and also the evaluation of the brand selected is more critical and extensive (Hawkins and Mothersbaugh, 2010), and this second approach would be most probably applied when selecting high-tech products. When trying to understand the way consumers make choices and evaluate the alternatives before selection, one needs to remember that in many cases, consumers do not make their choices rationally necessarily, they rather take into account the context and situation where the decision needs to be made (Hawkins and Mothersbaugh, 2010).

The consumer decision making process is not only about making brand choices, instead there are several processes that are associated with the various goals that consumers may try to achieve (Lawson, 1997, Bettman *et al.*, 1998). Lawson (1997) proposes a hierarchical goal structure with four different levels of goals, depending on what they are related to: abstract values, action programs, concrete product acquisitions, and finally brand acquisition goals. In the case of more abstract goals, consumers create various options that could also include different product categories even more so than of different brands of the same product category, and in the decision making process consumers consider which product helps to achieve their goal, instead of considering aspects of the product itself and doing attribute-based comparisons among the alternatives (Lawson, 1997). Living according to a green lifestyle is also a more

abstract goal that people with a high-level of altruism try to achieve (Markowitz *et al.*, 2012, Akehurst *et al.*, 2012, Phipps *et al.*, 2013).

Brown et al. (2011) consider that it is essential to have a theoretical framework that takes into account both the objective and measurable information as well as subjective brand-oriented information to fully understand how brands operate and succeed in buying contexts. There are two different views to the purchase decision making process with regard to brands, from the objective perspective sensitivity to a brand should decrease as the purchase risk of product increases; however, from a more subjective perspective, it is probable that sensitivity to brands increases when the purchase risk increases (Brown *et al.*, 2011). The Information Process Theory (IPT) does not consider all decision-making processes to be objective or even rational, i.e., that information related to the area of decision is first collected and then one relies on analyzed information when making the decision (Dean and Sharfman, 1993). However, according to the IPT, personal judgment, experience and other subjective items may need to be taken into account as buyers are also impacted by these, and sometimes cumulative information processing can surpass the capacity of the individual to handle the information in the decision making situation (Ronchetto *et al.*, 1989, Moorman, 1995). Consumers may sometimes be missing clear and concise product information, also on the eco-friendliness of a product, to be able to use it as a criterion in the purchasing situation (Moisander, 2007).

Consumption of goods is a very basic activity and a fundamental aspect in consumer behavior, and the process of consumption activities such as the search, choice and handling of goods is very similar by nature (Rajala and Hantula, 2000). Latest research indicates, especially in the case of fast-moving goods in a supermarket context, that the consumer decision making process and the foraging behavior of wild animals resemble each other (Rajala and Hantula, 2000). However, the theory of foraging behavior needs to also specify the currencies that consumers are maximizing (Rajala and Hantula, 2000), which is not necessarily only the price but could also include functional and symbolic features of brands that consumers maximize, including both utilitarian benefits as well as social and personal benefits that have symbolic significance (Foxall and James, 2003). With respect to the foraging behavior, it is important for companies to take into account in the design of the brand, products, as well as packaging that they contain very distinct features that help the consumers to easily find the brands they desire and are looking for on the internet as well as on the shelves of a retail stores, so that they do not make any errors in their choices by accident (Titus and Everett, 1996). With the technological advances in computing and networking by the help of the Internet, shopping experiences are brought back to the very basics and foraging models of choice can be readily observed via online services (Rajala and Hantula, 2000). When looking at the retail experiences of consumers in a physical store, the majority of the time is used to search for some specific product in complex environments, and these

situations are very similar online, this behavior is referred to as consumer in-store way-finding or search behavior (Titus and Everett, 1996).

The purchase of high-tech products that are high involvement products is very different by nature compared to the purchase of low involvement products that involve little risk (Young *et al.*, 2010). High involvement also refers to situations where the consumers have strong views and beliefs about the brand or product attributes, while in the case of low involvement products consumers do not have strong views and beliefs about the brand or product attributes (Zaichkowsky, 1985). For the low involvement situations, it has been stated that: 1) there is generally no active seeking of information on brands, 2) there is very little comparing of attributes on the product level, 3) different brands are perceived to be similar, 4) and there is no brand that would be preferred over others; the purchasing situation and behavior is just the opposite for high involvement products such as high-tech products (Lastovicka, 1979, Mitchell, 1979, Zaichkowsky, 1985).

Brands are favored by consumers as they assist in simplifying the decision making process in the purchase situation, as a brand summarizes complex product or service attributes and benefits so that when they have once been experienced and learned by the consumers, they can easily differentiate brands that have similar competitive offerings, and consumers can strengthen their loyalty towards a favorite brand (Baker and Hart, 2007). Due to the crowded and confusing markets, a large portion of consumers opt for the familiar and safe brand that they know and trust (Mohr *et al.*, 2010, Keller, 2013).

2.2 Brands and Measuring Brands

2.2.1 The Meaning of Brands to Consumers

The term ‘brand’ has changed meaning during its existence and it can be understood from both the company’s and consumer’s perspective (Stern, 2006). A brand is a name, term, sign, symbol or a design, or possibly a combination of these, that identifies products and services of a certain producer or seller by which it is differentiated from its competitors (Keller, 1993) and on the one hand it is treated as the result of a company’s financial result and brand equity (Ailawadi *et al.*, 2003, Stern, 2006), but brands also signal product characteristics and quality to consumers (Rao and Monroe, 1989, Aaker, 1996, Strizhakova *et al.*, 2011, Keller, 2013). The brand name is a form of identification for the company, also a badge of origin, even a promise of certain performance quality, a signal of the authenticity as well as an indicator of the essential properties and features of the product; brands help companies to provide clearer offerings and information to consumers on their products and services, also relating to quality and how they are unique and differ from other similar offerings (Strizhakova *et al.*, 2011, Keller, 2013).

A brand can also be understood to be a combination of consumer's perceptions (Fournier, 1998, Stern, 2006). Brands portray symbolic meanings that assist the consumers to reach their identity targets and build their personal projects, and the level of brand identification a consumer has with a brand is one of the important aspects in the brand markets as consumers are searching for ways to fulfill their identities (Keller, 1993, Aaker *et al.*, 1995, Stokburger-Sauer *et al.*, 2012). According to Keller (2013) various components that form a brand are called brand elements (e.g. brand name, logo, symbol, slogan, package, etc.) and the criteria for these are that they are: memorable, meaningful, likable, transferable, adaptable and protectable. When a brand element has a positive contribution to how the consumers consider it can also have a positive impact on the brand equity (Keller, 1993, Aaker, 1996, Keller, 2013).

In the case of branded products, there are studies that indicate that in developed and in developing countries consumers select products based on their quality, and brand quality is important because it decreases the risk of the purchase of a product (Zhou *et al.*, 2002, Steenkamp *et al.*, 2003, Erdem and Swait, 2004, Holt *et al.*, 2004, Strizhakova *et al.*, 2011). The more consumers consider branded products to have quality, the more important the branded products are considered to be, and consequently the use of global brands as quality signals increases and the more likely it is for the consumers to purchase global brands (Erdem and Swait, 2004, Tsai, 2005, Strizhakova *et al.*, 2011). Already Copeland (1923) stated that "*If it is a specialty line, the experience of the consumer with one article bearing the brand is likely to establish in the minds of consumers at least an attitude of preference for other articles bearing the same brand*" and "*The strength of the brand depends upon the degree of preference in the mind of the consumer*". After the stages of brand recognition and brand preference, (Copeland, 1923) introduces the stage of consumer insistence, which refers to a situation where a consumer will not accept substitutes for a preferred brand unless it is a case of emergency.

Contemporary research has found that brands can have an important function in the business markets as they not only signal product quality but also the level of relationship and experience that can be expected from the company by the consumer (Brown *et al.*, 2011). To the consumer, the brand portrays a promise or guarantee that the product will perform in specific ways and provide the consumers with a consistent performance experience in all touch points with the company, including, for example, distribution channels, customer service, pricing, warranties, etc. (Mohr *et al.*, 2010)

Even though times have been challenging for many companies in the times of the postmodern consumer culture (Firat and Venkatesh, 1995), brands have managed to gain power on the consumer markets as brands are still considered to be valuable as cultural resources that can be used to produce one's own self project according to one's own personal needs (Holt, 2002). However, to be considered as valuable resources for producing one's self project, the branded resources are required to be perceived as

authentic, as the postmodern consumer culture has a notion of authenticity which requires the brand to be detached and they should be perceived as having been invented and distributed without an economic agenda by companies that are only motivated by the inherent value of the brands (Holt, 2002). The brands that are successful and are favored by consumers have the following common attributes: the brands communicate quality, superior service, and differentiation which enables the company to penetrate the markets with more speed and gain competitive advantages as a first-mover (Baker and Hart, 2007) .

There are sources of brand information that the marketers cannot control and that consumers are exposed to, for example, communication by other commercial sources, word of mouth, and direct personal experiences of other users, as well as websites that write unfavorably about brands; also, consumers can personally associate a brand with people, places, or other elements in their own living environment and also consider these other associations as brand-related stimuli in situations where they are evaluating the brand (Keller, 2003, Romani *et al.*, 2012). Romani et al. (2012) have studied "*negative emotions towards brands*" (NEB), and they consider that those consumers' evaluations of brand-related stimuli which are not directly related to product or service properties and performance form the main sources of consumers' NEB. Consumers can feel dislike toward a brand if they associate it with a company that is believed to ignore, for example, basic human rights or its environmental responsibility, and in the case of negative emotional reactions, the brand-related stimuli may not even be directly associated with the actual products or services consumers are using (Romani *et al.*, 2012).

As consumers are understood to be critical and have got a more active role than being just receivers of branding messages, the focus and task of companies is to elaborate the management generated brand models with some consumer views in order to build a more dynamic corporate brand management framework (Ballantyne and Aitken, 2007, Rindell and Strandvik, 2010). The model for the framework proposed by Rindell and Strandvik (2010) is based on '*new consumer-focused views on corporate brand images*' which is an approach that takes into account that consumers' brand images are evolving continuously. The new concepts created by Rindell and Strandvik, '*image-in-use*' and '*image heritage*', help to conceptualize how brands evolve over time and can transform in the minds of consumers even on a daily basis due to different kinds of interactions with multiple sources. With reference to Pitt et al. (2006), Rindell and Strandvik propose that the traditional view of closed brands with controlled corporate brand images needs to be replaced by an open view of brands where corporate brands are open and evolve according to influences from various sources continuously.

The small and important differences between competing brands enable consumers to differentiate between products and services and these are the just noticeable differences that are often used as unique selling points that are memorable and meaningful to the

consumers (Aaker, 2011, Keller, 2013). Consumers need to be able to differentiate how the products and services satisfy their special needs that can be very specific and they base their choices on their perception of the possible solutions available as offerings (Baker and Hart, 2007). The one reason why it is possible to have many similar brands competing on the markets is that advertising has saturated each brand with a unique meaning that has value to its consumers, and the valued difference does not need to be a product feature it can be something symbolic or even emotional (Sharp, 2010).

Branded attributes have been proven to add credibility to a brand as well as consumer preferences towards the brands with premium prices, and consumers justify to themselves the higher prices based on the branded attributes even though consumers may not be sure how the attributes increase the superiority of the brand (Aaker, 2011). However, according to Sharp (2010) surveys across different product and service categories in different countries have revealed that the people purchasing a certain brand may perceive its differentiation weakly, but it does not prevent them from buying that particular brand; also the level of the perceived differentiation may resemble to that of the brand's competitors, and only approximately 10% of any brand's users think their brand is truly different (Sharp, 2010). This raises the question do the perceptions of brand differentiation actually influence consumer behavior or not, as buyers do not need to see a differentiation in order to buy a certain brand. This is the situation, for example, with the Apple brand. While Apple's perceived differentiation is higher than for some other computer and mobile phone brands, the majority of Apple users, as many as 77%, do not perceive the brand to be different or unique; the reason for this is that most computer users have so little technical knowledge that they do not understand anything about operating systems, and they just buy a certain operating system because it seems useful and is readily available (Sharp, 2010).

It could be that the perceived differentiation of a brand does not have a key role in the success of the brand, however, differentiation is something that most marketing and consumer behavior literature still emphasizes. As differentiation is not necessarily the reason why consumers buy a certain brand, it is suggested by Sharp (2010) based on recent literature and research, that it is brand awareness and salience or the status of a brand that pay a critical role in the purchasing situation for the consumer. Rindell and Strandvik (2010) have studied how corporate brand images can evolve in the daily lives of consumers, and they propose that corporate brand evolution would be the approach to incorporate the daily brand image constructions of consumers in the companies' branding strategies. To fully comprehend how their brands evolve, companies need to create new methods and approaches for following up the evolution of consumers' brand images over time (Rindell and Strandvik, 2010), however, there are still varying brand interpretations even within a company between the managers who are trying to improve the performance of a brand (de Chernatony, 2009).

When companies stop controlling consumer brand images and turn to a supporting mode, they need to find ways to find out what the consumers have in their minds, how they are perceiving the brands over time, and how much their perceptions may differ from the ones designed by the company (Pitt *et al.*, 2006, Rindell and Strandvik, 2010). This also helps the companies to manage their brands more dynamically by learning from the consumers continuously on an ongoing basis to understand the differences between the planned brand images and the realized brand experiences (Matthing *et al.*, 2004, Rindell and Strandvik, 2010). Earlier the Net Promoter Score (NPS) has been a popular measure that has been used to linking satisfaction, recommendation and business outcomes, and to understand the effectiveness of the company's business from the customer's perspective, but it is no longer considered to be sufficient and it has been challenged by researchers (Maklan and Klaus, 2011). When the need for real consumer understanding of the brand is recognized, so-called brand renovation becomes more consumer-focused (Rindell and Strandvik, 2010). Consumer-focused approaches to the analysis of corporate brands is treating them like open source brands, as defined by Pitt *et al.* (2006). Consumers interact with corporate communication both consciously and unconsciously, and in addition to reacting to company-related experiences, people also actively create images and meanings from multiple sources not only those provided by the company (Rindell and Strandvik, 2010).

2.2.2 Brand Measurements

This section offers an overview of the key brand constructs that have measurement scales constructed for them. The brand constructs that are measured in research can vary greatly depending on the view point and target of the research. This thesis focuses on the main constructs that help to understand better the brand-related research dealing with the kinds of relationships consumers form with brands, some of the measures can also be considered to be psychological constructs that are associated with a brand.

Below is a listing of existing literature and research on what aspects in the consumer interactions and relationships with brands can be measured. The brand constructs for which there exists some kind of a measurement scale or model are described based on literature. The section is closed by more details on how brand experiences of consumers can be measured, what is a brand experience measurement scale and what kinds of similar constructs and measurement scales exist.

Table 1. List of covered brand measurement scales

Brand Construct	Presented by	Measurement Scale
Consumer-Based Brand Equity (CBBE)	Aaker 1996	CBBE measure based on the four dimensions of brand equity – The Brand Equity Ten
	Park and Srinivasan 1994	Survey-based measurement method for CBBE
	Dyson 1996	Survey for estimating financial value of CBBE for brand images and associations
	Yoo and Donthu 2001	Consumer Value Model - CBBE scale based on Aaker's and Keller's conceptualizations of brand equity with 4 dimensions
	Netemeyer et al. 2004	Measure for core features of CBBE: Perceived quality, perceived value for cost, uniqueness, willingness to pay premium price for brand
	Hsieh 2004	Survey-based measurement for CBBE in a cross-national context, with national brand equity and global brand equity concepts
	de Chernatony et al. 2004	Consumer-based brand measure for corporate financial services brands that is similar to CBBE measure
	Keller 2013	Direct and indirect measurement of brand equity
	French and Smith 2013	Consumer-based measure for brand association strength that is considered to be an important element of CBBE
Brand Personality	Aaker 1997	Brand Personality Measurement scale with 5 dimensions
	Ambroise et al. 2000	Replication of Aaker's scale
	Geuens et al. 2009	New version of Aaker's scale
	Freling et al. 2011	Scale for Brand Personality Appeal with 3 dimensions
	Malar et al. 2012	Comparison of intended brand personality with realized brand personality
	Sung et al. 2015	Extension of Aaker's scale for measuring luxury brand personality
Brand Image / Brand Belief	Bird et al. 1970	Relative brand image response patterns
	Barnard and Ehrenberg 1990	Study on 3 brand attribute belief measurement methods

Brand Construct	Presented by	Measurement Scale
	Driesener and Romaniuk 2006	Replication of Barnard and Ehrenberg's work on belief measurement methods
	Romaniuk et a. 2012	Replication of Bird's work on brand image response patterns
	Schnittka et al. 2012	Brand Concept Maps to measure brand images via structure of brand association networks
Brand Attitude	Barwise et al. 1985	Study on attributes describing brand attitude variables
	Burton 1998	Scale for attitudes towards private label brands
	Sweeney and Soutar 2001	Scale to evaluate perceptions of the value of a durable good brand (PERVAL) with 4 dimensions
	Voss et al. 2003	Scale for hedonic and utilitarian dimensions of consumer attitudes (HED/UT)
Brand Attachment	Thomson et al. 2005	Scale for strength of consumers' emotional attachments to brands
	Park et al. 2010	Brand Attachment scale for measureing brand-self connections and brand prominence
Brand Love	Pawle and Cooper 2006	Measuring emotions on the basis of the Lovemarks theory
	Rossiter 2012	Measure that distinguishes brand love from brand liking
Brand Authenticity	Napoli et al. 2014	Consumer-based brand authenticity scale with 3 dimensions
	Morhart et al. 2015	Consumer's perceived brand authenticity scale with 4 dimensions
Brand Loyalty	Whithaker 1978	Study on brand loyalty and a measure for changes in purchasing pressure
	Duwors 1990	Measure based on event history analysis of nondurable products
	Fournier 1997	Measure for brand relationship quality based on strength of brand loyalty and dimensions of brand personality
	Odin et al. 2001	Brand loyalty measurement procedure based on methodology of Churchill (1979)
Brand Trust	Delgado-Ballester et al. 2003	Brand Trust Scale

Brand Construct	Presented by	Measurement Scale
Brand Involvement	Zaichkowsky 1985	Personal Involvement Inventory
Brand Experience	Chattopadhyay and Laborie 2005	Brand Experience Share (BES) tool
	Brakus et al. 2009	Brand Experience Scale (BBX)

2.2.2.1 Measuring Consumer-Based Brand Equity (CBBE)

In marketing research, the most brand measures are somehow tracking brand equity or Consumer Based Brand Equity (CBBE), and often these terms are used interchangeably (Netemeyer *et al.*, 2004). There is no universal measure for brand equity, the market sector and life-stage of the brand have to be taken into consideration when selecting an appropriate brand equity measure. The definition of CBBE given by Keller (1993) consists of the various aspects of brand knowledge that creates for the consumers a differential effect in their behavior towards a brand. The definition for CBBE created by Christodoulides and de Chernatony (2009) contains elements from both consumer psychology and information economics, and it states that CBBE is a set of perceptions, attitudes, knowledge, and behaviors of the consumers that increases utility and enables a brand to create greater volumes or gain greater margins with a specific brand name. The benefits of a CBBE scale is that it offers a way to test brand equity theories, and to verify whether brand equity brings value to consumers and enables them with confidence to make the purchase decision and are they satisfied with the choice (Yoo and Donthu, 2001).

The measurement of CBBE can be either direct or indirect: direct measurement focuses on the outcomes and estimates on the benefits created by the sources of brand equity in the brand value chain to see how a marketing activity has resulted and influenced the community (Keller, 2013). Indirect measurement concentrates on measuring potential sources of brand equity such as brand awareness and brand image that can influence the way consumers respond to a brand as well as the strength, favorability and uniqueness of the brand associations, and kinds of brand relationships the consumers form with the brand (Keller, 2013). Keller (2013) calls for marketers to design and implement brand equity measurement systems to collect information on responses to brands. Multiple techniques and measures are needed according to Keller (2013) to collect information from various sources and outcomes of brand equity. When measuring the actual sources of brand equity among consumers and customers, the brand managers need to take into account many different factors affecting brand awareness and brand images that can result in different kinds of consumer responses that constitute brand equity. In some

situations, consumers have a very integrated view of a brand that cannot be easily broken down to different elements, but then on the other hand individual perceptions of consumers can often be also analyzed separately (Keller, 2013).

Marketing research focuses on studying how CBBE influences consumers' purchasing behavior, however, there is hardly any knowledge on how CBBE can be associated with the actual buying behavior of consumers. Consumers vary greatly with regard to behavioral loyalty (Romaniuk and Nenycz-Thiel, 2013). Brand associations are an essential part of CBBE, and increased behavioral brand loyalty results in higher CBBE (Romaniuk and Nenycz-Thiel, 2013). The relationship between consumers' previous behavioral loyalty and present tendency to create brand associations show a positive relationship, so that in situations where there is a higher buying frequency and a higher share of category requirements there is also more likely to be more brand associations (Romaniuk and Nenycz-Thiel, 2013).

Aaker (1996) has proposed a Brand Equity Ten measurement scale that is structured based on the following four dimensions of brand equity: loyalty, perceived quality, brand associations and brand awareness. When creating a measure for brand equity, it should portray the value of the brand and sustainable advantage, it should also reflect the constructs that affect the markets, and the measure should be sensitive to any changes in the markets and applicable across different brands, product categories and consumer markets (Aaker, 1996). The Brand Equity Ten is targeted to help in the evaluation and tracking of brand equity over products and markets and it has direct questions on, for example, consumer related satisfaction, loyalty, and brand personality.

Park and Srinivasan (1994) have developed and survey-based measurement method for brand equity at the individual consumer level in different product categories as well as for the evaluation of the brand extension equity in a related product category. In this approach the brand equity is divided into attribute and non-attribute based components. With this method one can calculate the market share premium and price premium that can be attributed to the brand equity. The survey procedure is used to get the overall brand preference of all participating individuals based on attribute levels that are measured (Park and Srinivasan, 1994).

Dyson et al. (1996) have created a survey to estimate the financial value for CBBE for brand images and associations. The Consumer Value Model created by the team was done on the basis of survey data collected from consumers in the U.K. and it was calibrated by comparing it to their actual purchasing behavior, after which the model was applied to data collected from the U.S. and Spain. The target was to explain what portion of the consumers' expenditure was for each brand. The Value model is used to estimate the value share of requirements per brand in the case of each respondent (also referred to as customer loyalty), which tells how the consumer will divide their spending in a certain category among the available brands (Dyson *et al.*, 1996).

Yoo and Donthu (2001) have focused on creating a scale to measure CBBE that is a multidimensional consumer-based brand equity scale and based on Aaker's and Keller's conceptualizations of brand equity. They have adopted a consumer-based behavioral view of brand equity which is the consumers' varying responses between a real brand and an unbranded product when both brands provide the same kind of marketing stimuli and product features (Yoo and Donthu, 2001). CBBE is divided by Yoo and Donthu (2001) into four dimensions: brand loyalty, brand awareness, perceived quality of brand, and brand associations, with reference to Aaker (1996) and Keller (1993). Yoo and Donthu (2001) suggest that there may be a causal order among the dimensions of brand equity so that brand awareness and associations anticipate perceived quality, and that perceived quality anticipates brand loyalty. What makes the measure of Yoo and Donthu (2001) consumer-based is the fact that it measures cognitive and behavioral brand equity on the individual consumer level.

The CBBE measure developed by Netemeyer et al. (2004) focuses on four core features of CBBE as labelled by the authors: perceived quality (PQ), perceived value for the cost (PVC), uniqueness and willingness to pay a price premium for a brand. According to their findings based on results from 16 different brands and over 1000 respondents, Netemeyer et al. (2004) propose that PQ, PVS and brand uniqueness are direct antecedents of the willingness to pay a price premium for a brand, which again is a direct antecedent of brand purchasing behavior of consumers. In the first phase of the scale development, 17 CBBE items were included: four describing the PVC, five for the PQ, three for the uniqueness, and five for the willingness to pay premium price (Netemeyer *et al.*, 2004). Later the researchers noticed that there was a very high correlation between the PQ and the PVC which is an indication of a lack of discrimination between the constructs, and in their second study the measure was further developed into a three factor model where the PQ and the PVC were combined to an eight item factor with four PVC and four PQ items, and the uniqueness factor with four items and the price premium factor with four items.

Hsieh (2004) has developed a survey-based method to measure CBBE in a cross-national context, and suggests a concept of national brand equity (NBE) and measurement model that includes two components from the CBBE: measured and unmeasured brand equity. Measured brand equity shows the effectiveness of an individual consumer’s benefit associations in a global context, and the unmeasured brand equity shows the value that is associated with a brand but it is not measured by the commonly used associations. Hsieh (2004) applies the NBE model with 18 brands in 16 global automobile markets. As there are already a great number of global brands, Hsieh (2004) has also created a model for Global Brand Equity (GBE) in order to evaluate what is the brand’s value in comparison to its competitors globally. The GBE model is based on the NBE model, and it includes national weighting factors that are aggregated from the national level across the countries in scope of the calculation, and the results is a global brand equity index that can be used to benchmark to find the best

brand in the scope of the calculation as well as the relative value of the specific brand in the global market. All in all, the GBE includes the NBE model and the weighting factors, including the level at which the brand is recognized, the size of the market, and how the attachment of the consumers differs in relation to specific brands (Hsieh, 2004). Hsieh (2004) considers that GBE can be used for multiple brands in an international context.

De Chernatony et al. (2004) have developed consumer-based brand measure for corporate financial services brands that is similar to CBBE measure. It is based on the methodology described in the Churchill paradigm, and the components of this measure are brand loyalty, brand satisfaction and brand reputation (de Chernatony *et al.*, 2004).

French and Smith (2013) have developed a consumer-based measure for brand association strength that is considered to be an important element of CBBE. In their research, they find that in order to measure brand association strength, it is not enough to ensure that you have the right number of associations, but also the structure needs to be appropriate so that there is the right number of first-order, second-order and tertiary associations and these associations need to be linked to each other appropriately. This is what French and Smith (2013) call structural density and it considers the types of associations and the links between them which then gives a more realistic picture of the number and kinds of connections in a presentation format that is called a brand concept map (BCM). Then the structural density combined to the number of associations to form the measure of brand association strength (French and Smith, 2013). BCMs can be compared to each other to find the areas where there may be, for example, associations missing (French and Smith, 2013). BCMs have also been used to measure brand images (Schnittka *et al.*, 2012) (See under the section on Measuring Brand Images / Brand Beliefs).

2.2.2.2 Measuring Brand Personality

Aaker (1997) created the concept of brand personality with five dimensions: sincerity, excitement, competence, sophistication, and ruggedness. According to Aaker (1997), other researches have shown that brand personality increases among consumers the preference and usage of a specific brand, raises emotions towards the brand and also increases trust and loyalty towards the brand. Brand personality refers to human characteristics that consumers associate with a brand and it is used in a symbolic or self-expressive way, and when consumers are engaged with brands in way that is relevant for themselves, brand information and experiences can be consolidated by interpreting traits and personality characteristics of a brand (Aaker, 1997). The brand personality measurement scale is based on how consumers perceive brands, and it has the following five distinct dimensions: Sincerity, Excitement, Competence, Sophistication, and Ruggedness. This five-dimensional brand personality scale is the first one built across product categories and various brands which also allows the scale to be used to compare

personalities of brands across product categories. Brand personality has become an important brand element in marketing research as well as in brand management activities because it helps to understand brand effects and a company's performance. (Aaker, 1996, Malar *et al.*, 2012).

Ambroise et al. (2003) replicated Aaker's personality scale in a French context with 12 brands and found that the personality structure was reliable and valid, and also it proved to be stable across francophone cultures. Aaker's brand personality scale has, however, been challenged by Azoulay and Kaferer (2003) who claim that the scale merges several different dimensions of brand identity and they call for a new stricter definition of brand personality. Also Geuens et al. (2009) criticize the vague definition of brand personality, and the fact that the scale cannot be generalized on the level of one brand but it only enables between-brand comparisons, and the five factors cannot be replicated cross-culturally. Geuens et al. (2009) developed a new version of the original brand personality measurement scale which only consists of personality items and no other characteristics of the perceived users (e.g. gender, age) which also allowed to shorten and simplify the scale and make it easier to administer. According to Geuens et al. (2009) the refinement of the measurement scale was essential to increase the construct validity and reliability and also enable individual brand level comparison between the respondents.

Freling et al. (2011) have constructed a measure for brand personality appeal, which is a brand's ability to appeal consumers via brand personality, and they conceptualize it with three dimensions: favorability, originality and clarity. The aim of this measure is to find the degree of consumers' appeal to a brand's personality in order to enable managers understand better the relevance, potency and longevity of a brand and what kind of an impact the personality of a brand has on consumers' purchasing behavior (Freling *et al.*, 2011).

Malar et al. (2012) have studied how an intended brand personality, that a company's brand management would like consumers to consider as the brand's personality, is transformed into a realized brand personality, i.e., the actual perception of the brand's personality by the consumers. The uniqueness of the brand personality, the competitiveness of the brand, the reliability of brand related communication, consumers' intensity in the involvement with the product, and the prior brand attitude of consumers all have an effect on the extent to which the brand personality features designed by brand management are actually perceived by the consumers (Malar *et al.*, 2012). Malar et al. (2012) used both managers and consumers as data sources in their research to measure how successfully brand personality has been implemented. To measure brand personality performance, Malar et al. (2012) used the five-dimensional brand personality conceptualization developed by Aaker (1997) in the case of both consumers and managers to understand how both groups characterize the underlying brands. They focused on analyzing the preceding factors of the fit between the intended

and realized brand personality. Malar et al. (2012) were able to show that the similarity between the intended brand personality and realized brand personality can have a positive influence on the brand performance by increasing brand loyalty and also the market share of the brand, and the successful implementation of an intended brand personality has a positive influence on the performance of a company. Malar et al. (2012) consider an intended brand personality to be successfully implemented when the brand personality is perceived by consumers in the same way as the brand managers designed the personality.

In a very recent brand personality measure development research project based on the brand personality scale of Aaker (1997), Sung et al. (2015) refined and extended the scale to measure luxury brand personality. In their research, they found that the three dimensions for Excitement, Sincerity and Sophistication included in Aaker's scale are applicable also in the luxury brand context, however, they also tested other dimensions and the three additional dimensions that emerged from their research in the case of luxury brands were: Professionalism, Attractiveness and Materialism.

2.2.2.3 Measuring Brand Image

Brand image refers to a certain set of brand associations or perceptions that consumers have about brands and that they link to a certain brand in their minds; these perceptions are collectively referred to as the brand's image, which is also an important part of consumer-based brand equity (CBBE) (Keller 1993). Brand images can be used to check the positioning of the brand and evaluate how effective the advertising has been (Keller, 1993, Driesener and Romaniuk, 2006).

According to Bird et al. (1970) the usefulness of data on brand images is dependable on how much differences it can clarify in the purchasing or usage behavior of consumers per brand, and the actual use and purchasing should be one of the variables in the brand image studies, which means that users would not be compared to non-users of a brand. Their main finding was on the relative brand image response patterns within different customer and consumer usage groups. The data Bird et al. (1970) analyzed in their research was from a British Market Research Bureau on seven various product fields and the questionnaire was based on a standard Advertising Planning Index (API) questionnaire including five to ten brand image questions for each field. The formulation of the questions per field varied from usage times and current usage, also the respondents were asked to select attributes for the brands, from pairs of attributes that have opposite meanings. A notable point about the data collected in the research of Bird et al. (1970), is that the data collection process was not unified, instead there were numerically different results that have been obtained by different measurement techniques, under different conditions, on different kinds of brands and products, with different kinds of usage questions, and at different points of time, however, Bird et al. (1970) argue that it is unlikely that some other questioning techniques could lead to very

different kinds of relationships. The main finding from the research of Bird et al. (1970) is that the proportion of the current users of a certain brand who have a certain attitude toward the brand is systematically related to the proportions of former users of the brand and the consumers who have never tried the brand. According to Bird et al. (1970) the mathematical formula describing the relationship is dependent on the measurement techniques, however, there is a general pattern in the results that is most probably generalizable for those product fields where the normal buying behavior also has repeat purchasing as one relevant feature.

The work of Bird et al. (1970) was replicated by Romaniuk et al. (2012) with 45 data sets covering 19 different categories of packaged goods, including services, durables and retailers (e.g. food, personal and household products, and beverages), from seven developed countries. Data was collected with modern data collection methods, also by online. The findings of the research indicated a similar and systematic relationship between different usage categories and response levels for brand attributes. Also Romaniuk et al. (2012) report that the generalization applies still that brand association responses are heavily and systematically linked to the past brand usage of the consumers, both qualitatively and to the most part also quantitatively. The pattern discovered by Bird et al. (1970) describing the relationship between a consumers' use of a brand and their inclination to give brand image related responses is still relevant and can be considered to be an important finding according to Romaniuk et al. (2012), even though the marketing ecosystem has changed drastically in the past four decades since the initial finding by Bird et al. Romaniuk et al. (2012) adopted the same approach in their research and sought patterns that can be generalized across many sets of data, and they analyzed differentiated replications in a number of different categories (service, retail, and durable) and in the emerging markets (i.e., China, Russia and Brazil). The ratio of responses of former users and those users who have never tried the brands in comparison with the current users in the study of Romaniuk et al. (2012) was comparable to the original result of Bird et al. (1970). When comparing the different brand image measurement methods (ranking, rating, free-choice or pick technique (Barnard and Ehrenberg, 1990, Driesener and Romaniuk, 2006) the results appear to be very similar and there is correlation between brand usage and brand image associations. One of the new findings of Romaniuk et al. (2012) is that the free-choice/pick any method is faster to manage and it is more often used in the industry brand surveys.

A concept that is very close to brand image is 'brand belief', that has been tracked in marketing with reference to positioning and segmentation, evaluation of advertisements and when tracking brand images (Barnard and Ehrenberg, 1990). Three different techniques for collecting and analyzing consumers' beliefs about the attributes of brands for packaged goods have been compared, and assessed by Barnard and Ehrenberg (1990) in order to see it they relate to brand usage in the similar way. These methods are the free choice, scaling, ranking methods. Research prior to Barnard and Ehrenberg (1990) on brand attribute belief measurements has mostly concentrated on measures

tracking the variety in the degrees of associated attitudes which are impacted by choice usually (Menezes and Elbert, 1979, Kalwani and Silk, 1982). Some of these studies include, for example, analyses of absolute or comparative scales; scales that are either verbal, numerical, or spatial scales; the number of points on the scale; and the treatment of responses that are neutral, indicate no opinion, or when the respondents don't know the responses (Barnard and Ehrenberg, 1990).

Barnard and Ehrenberg (1990) collected data consisting of belief responses for 12 to 13 attributes on 8 to 9 brands in 5 different product categories (e.g. cereals, washing powders, canned soup, toothpaste). The recency and frequency of purchasing a certain brand was also measured by Barnard and Ehrenberg (1990), and they used eight predefined categories for recency or frequency of the purchase. They found that the measurement methods tended to very often have competing brands in the same relative positions for the attitudes, and the concept of attitudinal belief was confirmed by all of the three measurement methods, which means that the relationships between attributes and brand usage that have been found empirically are not only a result of any one method. Also Barnard and Ehrenberg (1990) state that the consistency of the different kinds of findings indicate that there is also convergent validity for their brand belief measures.

Driesener and Romaniuk (2006) replicated the research of Barnard and Ehrenberg (1990) with very similar results. Sorting and scaling are the two main categories into which the techniques of measuring brand images can be assigned according to Driesener and Romaniuk (2006). Scaling techniques can be used to analyze if there is an association between an attribute and a brand and what is the strength of the association, while sorting techniques only help to only determine whether an association exists, which is why sorting techniques are not resorted to often in researches as scaling brand image techniques are considered to be the best and only proper brand image measures (Driesener and Romaniuk, 2006). However, based on the few studies comparing these two techniques it can be stated that they both have as outcomes similar brand level results for brand and attribute associations which indicates that both techniques are just as effective for discovering the links between brands and attributes (Barnard and Ehrenberg, 1990, Driesener and Romaniuk, 2006).

The objective of the study of Driesener and Romaniuk (2006) was to also extend the comparison of the techniques for brand association measurements to other than fast moving consumer goods (FMCG) markets and look closer at individual level responses. Driesener and Romaniuk (2006) used three brand image measurement techniques: Likert-scale rating, ranking (scaling), and pick-any (sorting), and all the measurement techniques provided comparable results on the brand and individual level. Driesener and Romaniuk (2006) did an extension of the past research in a different type of market and country, and it proved to be a valuable validation of the findings in the earlier research by Barnard and Ehrenberg (1990). On the brand level, the brand hierarchies were shown

to be equivalent and the users of the brands gave more positive responses than the non-users, which is fully in line with the earlier findings (Driesener and Romaniuk, 2006). The more considerable part of the extension included the analysis on the individual level which proved that individuals used the all the techniques consistently, but when users were asked to do unique rankings of brands there were artificial differences visible on the lower level rankings, which indicates that respondents could more easily determine which brands had a certain attribute associated with it than stating which brand are less associated with some attribute (Driesener and Romaniuk, 2006). This issue could be dealt by letting the respondents select which brands they want to rank and not require them to rank all the brands in the survey, according to techniques provided comparable results on the brand and individual level. Driesener this would increase the validity of the rankings. The results of the research of Driesener and Romaniuk (2006) confirm the results of the earlier research and thus indicating that the three measuring techniques can be interchanged rather easily and reliably, however, there is a significant difference in the time required to manage the different approach: the free-choice (pick any) was approximately 50% faster to manage than the other two approaches, which was found in other two replications of the research. This is an indication, according to Driesener and Romaniuk (2006) that the pick any approach is the most efficient one of the three, and the time savings are so remarkable that it is more cost-effective also to consider to convert to this approach even if originally some of the other approaches is considered to be used.

Brand concept maps (BCM) can be used to measure brand images by using the structure of the underlying brand association networks which show the strength of the brand associations (John *et al.*, 2006). Schnittka et al. (2012) extended the original BCM approach of John et al. (2006) with information on the favorability of the brand associations and developed a metric called brand association network value (BANV), that shows the overall network favorability of a brand. The extended BCM model and the BANV metric make enable the comparison of the brand networks on individual and aggregate levels (Schnittka *et al.*, 2012). Brand concept maps have also been used to measure CBBE by French and Smith (2013). (See above under the section on Measuring CBBE.)

2.2.2.4 Measuring Brand Attitude

The value and relevance of brand attitude in the high-tech markets has also been researched and the finding is that in the computer and SW industries brand attitude can be an indicator of brand equity (Aaker and Jacobson, 2001). Consumer attitude measurement is used for doing brand positioning in the companies with regard to competing brands and products; and attitudes are considered to partially predict also consumer purchasing behavior (Barwise and Ehrenberg, 1987).

Barwise and Ehrenberg (1987) did not construct a scale to measure attitudes, instead respondents were asked to comment on a list of leading brands whether they have a certain attribute with 10-15 attribute options and how often they purchase that specific product. Based on their research, Barwise and Ehrenberg (1987) conclude that brand attitude variables can be evaluative or descriptive: evaluative variables distinguish user and non-users of a brand, and descriptive variables distinguish brands from each other, however, the reason why the consumers have bought a certain brand is not revealed in this approach.

Burton et al. (1998) developed a measure for tracking consumers' attitudes towards private label brands, i.e. store brands. Generally, consumers with favorable attitudes to private labels are also very cost conscious and want to pay the lowest price, which minimizes the other factors when they are evaluating brands (Burton *et al.*, 1998). The scale includes items related to price (price consciousness, value consciousness, and price-quality perception), general deal proneness, deal-specific proneness (e.g. coupons, sales, rebates, free gifts, and contests), in addition to brand loyalty, impulsiveness, risk averseness, smart-shopper self-perception, and reliance on internal reference price. The scale was tested with three different models, and the outcome was a private label attitude measure that showed that a private label attitude is positively related to value consciousness and deal proneness, and negatively related to brand loyalty and price-quality perceptions, also there were positive relationships between private label attitude and reliance on internal reference prices and smart-shopper self-perception, and a negative relationship between private label attitude and impulsiveness (Burton *et al.*, 1998).

Sweeney and Soutar (2001) created a 19 item measurement scale to evaluate consumers' perceptions of the value of a durable good brand (PERVAL). In the development of the scale, four distinct value dimensions surfaced: emotional, social, quality/performance and price/monetary value. The construct also included both utilitarian and hedonic elements, which takes into account that consumers are appealed to a product or brand both on an emotional and rational level. The scale was also tested both pre-purchase and post-purchase situations, and it was proven to be reliable and to have construct validity (Sweeney and Soutar, 2001).

Voss et al. (2003) developed a measurement scale that measures the hedonic and utilitarian dimensions of consumers' attitudes (HED/UT scale) to different product categories and different brands within categories. The HED/UT scale has ten items, five for the hedonic dimension and five for the utilitarian dimension of consumer attitudes (Voss *et al.*, 2003). The results indicated that the two constructs are two distinct dimensions of the brand attitude that can be measured by the HED/UT scale. The multidisciplinary approach in the research of Voss et al. (2003) is similar to development in marketing already driven by Hirschman and Holbrook (1982). In earlier research, product and brand attitudes have been analyzed from one dimension, later the

approach considering attitudes has developed to be more complex and multidimensional (Bagozzi and Burnkrant, 1979) has led researchers in marketing to create an experiential view of consumption that is more integrated with traditional functional approaches (Park *et al.*, 1986, Mano and Oliver, 1993).

The two-dimensional HED/UT scale of Voss et al. (2003) consists of adjective pairs that include hedonic and utilitarian dimensions of a product attitude, and for the Hedonic dimension they are: Not fun/ Fun, Dull/ Exciting, Not delightful/ Delightful, Not thrilling/ Thrilling, Enjoyable/ Unenjoyable and for the Utilitarian dimension: Effective/ Ineffective, Helpful/ Unhelpful, Functional/ Not functional, Necessary/ Unnecessary, Practical/ Impractical. Voss et al. (2003) replicated the research with several data samples in different geographies and with different stimuli to confirm the reliability and validity, and they were successful in measuring attitudes for different product categories and brands within those product categories, however, before more reliable generalizations can be made more research is still required in this area. One of the results of the research of Voss et al. (2003) was a parsimonious and manageable scale as the result of item reduction, and the item reduction process itself is of benefit for other developments of measurement scales.

2.2.2.5 Measuring Brand Attachment

Consumers may be in contact with numerous brands during their lives, however, they are considered to form tight emotional attachments only to a very few of these (Schouten and McAlexander, 1995). An attachment can be considered to be an emotional targeted bond between a person and a certain object, and it can differ in strength so that the stronger they are, the stronger are the feelings of connection, affection, love and passion (Thomson *et al.*, 2005). It is a basic human need to form strong emotional attachments, and brand attachment is a construct that is important in describing how strong the bonds are between brands and consumers, and what is their effect on behaviors that support brand profitability and consumer life time value (Thomson *et al.*, 2005).

Thomson et al. (2005) developed the first scale to measure the strength of consumers' emotional attachments to brands. This scale is based on emotional terms that describe the strength of consumers' attachments to a brand, and it can be mapped to measures for maintaining proximity, seeking security, experiencing distress from separation and finding a safe refuge in an object when under distress. Thomson et al. (2005) also prove the discriminant validity of the measure by showing that the measure is distinct from such brand attitude measures as favorability, satisfaction, and involvement, and they also found evidence that the scale can be used to predict commitment and loyalty to a brand as well as willingness to pay premium prices for certain brands that a consumer can be strongly attached to. The data collected by Thomson et al. (2005) indicates that

the concept of emotional attachment is a second order factor that consists of three first order factors: connection, affection, and passion.

Park et al. (2010) created a scale for measuring brand attachment by selecting items that describe the brand-self connections of the consumer, and with their scale they aimed to show that brand attachment and attitude strength are distinctly different constructs. The research into the strength of brand attitudes is one aspect that calls for the construct of brand attachment, however, it is important also to consider whether the brand attachment construct really differs from the construct of brand attitude strength and what is the additional value of the concept (Park *et al.*, 2010). According to Park et al. (2010), however, research has not been able to show whether the two concepts differ really conceptually or empirically earlier, and they have differentiated the constructs by arguing that they have distinct conceptual properties and have are formed differently. Park et al. (2010) validated the difference between the constructs empirically by developing a new scale with which they can link to the conceptual properties of brand attachment and assess how brand attachment is related to brand attitude strength. Also they show empirically that the concepts have distinctly different implications to behavior. According to the findings of Park et al. (2010) brand attachment is a better predictor of consumers' intent to behave in ways that notably use their resources (time, money, reputation) as well as their actual behavior than the brand attitude strength construct. The first version of the brand attachment scale developed by Park et al. (2010) had eight items, of which five items reflect how the brand and self is connected and three items represent brand prominence; the items were selected on the basis that they can most appropriately map the conceptual definition of the two constructs statistically. Later the scale was reduced to four items, two for both indicators, which makes the scale more parsimonious (Park *et al.*, 2010).

2.2.2.6 Measuring Brand Love

The concept of 'brand love' recognizes differences in the strengths of emotional responses of satisfied consumers to a brand, and it is a distinct from brand satisfaction and brand affect as it offers brand professionals an objective that can be strategically used to differentiate satisfied consumers (Carroll and Ahuvia, 2006). Satisfied consumers who love a brand are foreseen to be more committed to repurchasing the brand and more keen to spread positive word of mouth (Carroll and Ahuvia, 2006). Also Fournier (1998) has highlighted the importance of a love dimension in a consumer's long-term relationship with a brand and especially in the case of high consumer satisfaction, the satisfaction that demonstrates itself as love is probably the strongest and deepest kind of satisfaction.

The measuring of emotions in the context of brands is becoming more important, as emotional intelligence is also increasingly critical for advertising development. There is differentiation being done with regard to emotional benefits, in addition to the

differentiation of functional benefits, in the case of technical advances in product performance (Pawle and Cooper, 2006). Roberts (2004) states that so-called '*super-evolved brands'* have stronger emotional bonds with their consumers than other brands and this strong connection revitalizes brand loyalty and creates brand advocacy which can also have a transformative effect in the competitive environment.

The research of Pawle and Cooper (2006) tested the Lovemarks theory of Roberts (2004) and developed a diagnostic tool to test brands. The factors identified by Roberts in the theory were validated in this research: intimacy, mystery, sensuality, trust, reputation and performance that emerged from the analysis of Pawle and Cooper (2006) as the main factors impacting the love and respect for brands. The research also proved that the lovemarks to brands are associated with higher consumption and positive attitudes and values. Pawle and Cooper (2006) demonstrate the significance of emotions in the consumer-brand relationships and define how one can measure the emotions on the basis of the Lovemarks theory according to which nowadays brands should not only be respectable, but also strong and lovable so that consumers can form strong relationships with them. Pawle and Cooper (2006) combine qualitative and quantitative methods to measure emotion. They also show that the proportion of emotional aspects in brand decisions is considerably greater than the functional factors, and depending on the product category it can range from 63% to 85%. Pawle and Cooper (2006) suggest a working model how the emotional and rational processes work and interplay in the creation of brand relationships. They have used in their research as product categories magazines, breakfast cereals and cars, however, they consider that their findings are applicable and generalizable also in marketing and communication (Pawle and Cooper, 2006).

Rossiter (2012) has created a measure that helps to distinguish brand love from brand liking, and based on the findings of this research, approximately one fourth of a brand's consumers end up loving the brand. The difference between loving and liking a brand can be seen very clearly in the consumer behavior, as those consumers who love a brand buy, use or recommend a brand twice as often as those who just like a brand (Rossiter, 2012). Rossiter (2012) designed a new measure and items that have well construed response categories for five options: hate, dislike, neutral, like and love. One of the issues that Rossiter (2012) claims to have tackled is the content validity of the emotional scale, that has been very difficult to measure with continuous response scales.

2.2.2.7 Measuring Brand Authenticity

In the case of postmodern consumers, brands are important for creating an authentic self-image and to connect to location, time, culture and other people, and consumers refer to different kinds of cues to associate authenticity to branded objects, however, there have not been earlier any measures for the construct of brand authenticity (Napoli *et al.*, 2014). Consumers' search for authenticity is part of their identity project and it is

objective focused (Belk *et al.*, 1989, Napoli *et al.*, 2014). Brand authenticity is critical to brand status, brand equity and the reputation of the company (Beverland, 2005). The relevance of authenticity for brands and consumer behavior has been highlighted by many researches (Holt, 2002, Beverland, 2005, Rose and Wood, 2005, Leigh *et al.*, 2006), but still it seems that the references in marketing to brand authenticity are scarce, and there are only some isolated references to, for example, origin (Victorinox's '*made in Switzerland')*, production techniques (Lush's '*handmade*'), moral values (Microsoft's '*empower youth to change their world*') to demonstrate the brand's authenticity (Morhart *et al.*, 2015).

Napoli et al. (2014) developed a consumer-based brand authenticity (CBBA) scale that includes the consumer perspective; it includes 14 items for three different factors: quality commitment, sincerity and heritage. In one of their surveys, Napoli et al. (2014) included measures for two related concepts: the measure of brand trust, based, for example, on Delgado-Ballester et al. (2003) and brand credibility based, for example, on Kirmani (1997).

Morhart (2015) have developed an integrated framework describing the concept of brand authenticity and a scale measuring consumers' perceived brand authenticity (PBA), consisting of 15 items for four dimensions: credibility, integrity, symbolism, and continuity. Based on the data collected from Europe and Northern America, the scale was proven to be valid across different brands and cultures. Based on their findings, Morhart (2015) propose that PBA increases emotional brand attachment and it impacts the brand selection for those consumers who have need for high self-authenticity. Morhart (2015) conclude that there is some conceptual overlap in their measurement constructs, and there is not full discriminant validity between the dimensions of credibility. Morhart et al. (2015) were not able to fully demonstrate discriminant validity between the PBA dimension credibility and brand trustworthiness, and the brand personality dimension sincerity, which indicates that the concepts in the constructs overlap. The PBA scale as a whole is a new construct, however, it consists of dimensions that are based on already existing constructs, and the contribution of Morhart (2015) was the integration of these dimensions into a new PBA construct.

2.2.2.8 Measuring Brand Loyalty

One of the first to present the concept of brand loyalty was Copeland (1923), and there have later been numerous approaches to measuring brand loyalty, however, there is still discussion on the concept to find better approaches to understand, measure and promote brand loyalty (Fournier and Yao, 1997). When brands signal quality and the consumers are satisfied with them, they can become loyal to a brand (Keller, 2013), and loyalty can be considered to demonstrate itself in two ways: as a behavior or as an attitude (Odin *et al.*, 2001, Kim *et al.*, 2008). Brand loyalty can also be considered to be a sensible buyer's strategy that helps to balance risk taking and avoid wasting the individual

consumer's precious time, and being loyal to certain brands is something most consumers tend to do naturally (Sharp, 2010, Keller, 2013). Sharp (2010) refers to emotion-based brand loyalty and brings up as examples the Harley Davidson and Apple brands that both have passionate and very loyal consumer bases. In the case of these well-known brands, it seems that the consumers of these brands can actually be loyal to a number of brands; in the case of Harley Davidson, buyers purchase other bikes twice as often as they purchase Harleys, and in a similar fashion the repeat-purchasing for Apple is only 55% (Sharp, 2010).

Brand loyalty can also be examined from the perspective of the interpersonal relationship theory which reveals that not all brand relationships are similar and that they are dependent on the relevance that the consumer gives to the brand, and individuals may also give different meanings and interpretations to brands (Fournier and Yao, 1997). Fournier's (1998) concept of brand relationship has close ties with the concepts and constructs of brand loyalty and brand personality. A brand relationship is formed on basis of the strength of brand loyalty and different dimensions of brand personality from consumers' real life experiences (Fournier, 1998). For measuring created a brand relationship quality Fournier (1998) created a tool for conceptualizing and estimating brand relationship strength.

Brand loyalty has often been measured from observing directly consumer behavior, so that the purchasing behavior of a small number of consumers is monitored, and also data is collected by interviews or questionnaires for a certain set of competing brands (Whitaker, 1978). Repurchases and brand switches can then be calculated as well as estimates of brand loyalties, and the reliability of the estimates depend then on any changes in consumer behavior that has been impacted by the actual study, interviewers and questionnaires (Whitaker, 1978). Whitaker (1978) has analyzed aggregate data from past observed market brand shares that has been followed up over several years and also checked the measure of purchasing pressure. From this empirical data, Whitaker (1978) found that brand loyalty usually changes fairly slowly, instead purchasing pressure tends to change more often, even from purchase to purchase, and therefore brand loyalty has been measured with the assumption that brand loyalty is a constant over a certain period of time and purchasing pressure depends on time. However, it can be challenged whether brand loyalty is constant by analyzing the possible variations in brand loyalty over longer periods of time (Whitaker, 1978).

Duwors and Haines (1990) highlight the difference between the definitions of market share and brand loyalty: market share is a company's proportion of an industry's total actual volume and it is even possible that a brand has a low market share and it can still have high loyalty, so brand loyalty and market share should not be measured empirically in the same way. Brand loyalty is also transient and temporary as consumers swap brands after a certain period of repeated purchases of a certain brand (Duwors and Haines, 1990). Duwors and Haines (1990) propose that brand loyalty measuring would

be done on the basis of event history analysis for brands of nondurable products. The measure is estimated according to data collected by diaries and scanners.

Odin et al. (2001) conceptualized, tested and validated a brand loyalty measurement procedure based on the methodology of the Churchill (1979). Initially, they had 18 items selected for the scale, but they were reduced to 12 after Principal Component Analysis, and the scale was tested with students (Odin *et al.*, 2001). The items were related to repeat purchasing behavior in addition to the loyalty and multi-loyalty items.

2.2.2.9 Measuring Brand Trust

Brand trust and commitment need to be also linked together, as trust is relevant in relational exchanges and commitment is also associated with such valued relationships (Delgado-Ballester *et al.*, 2003). There are two components in successful and positive relationships: satisfaction with the brand and trust in the brand (Delgado-Ballester *et al.*, 2003). Especially in the case of online shopping experiences and to build consumer loyalty, the creation and measurement of brand trust is in a central role, and because of the anonymity of the internet, branding is even more critical (Delgado-Ballester *et al.*, 2003).

Delgado-Ballester et al. (2003) conceptualized brand trust as a feeling of security perceived by the consumer with reference to any interactions with a specific brand, and based on this conceptualization they developed the Brand Trust Scale (BTS). They propose that the BTS could be used as a tool to manage brand equity as it provides information on how supportive and consumer-oriented the brands are perceived to be by the consumers. The logic of brands is to relay trust to the market as direct contacts between consumers and companies are not possible, and the BTS makes it possible to understand the role of brand trust in the development of brand equity (Delgado-Ballester *et al.*, 2003).

2.2.2.10 Measuring Brand Involvement

The most common definition of involvement in the case of products, advertisements and purchase decisions is that it is a consumer's perceived relevance of the product based on one's inherent needs, values, and interests (Mitchell, 1979, Zaichkowsky, 1985). This definition was also used by Zaichkowsky (1985) when creating the involvement construct and scale, called the Personal Involvement Inventory (PII). To measure the involvement with products Zaichkowsky (1985) developed a bipolar adjective PII scale that includes a thirty-item scale measuring involvement over three domains: products, advertisements, and purchase decisions, and the study focused on the involvement with products. Zaichkowsky (1985) has considered involvement to be a person's perceived relevance of an object based on one's own personal needs, values, and interests. The scale is a semantic differential scale measuring involvement with products and it covers three different product categories and several statements of behavior representing the

level involvement. For all three product categories used in the study, there was a positive relationship between the scale scores and the subjects' responses to the statements of theoretical propositions related to involvement (Zaichkowsky, 1985). The measure of involvement is independent of the behavior that results from involvement and it is sensitive to the areas that affect a person's involvement level in three categories: 1) personal - inherent interests, values, or needs that motivate one toward the object, 2) physical - characteristics of the object that cause differentiation and increase interest, 3) situational - something that temporarily increases relevance or interest toward the object (Zaichkowsky, 1985).

2.2.2.11 Measuring Brand Experience

There is a need to measure the kind of experiences consumers have with brands as they may differ greatly from the company-based view of the brand performance on the markets, however, many companies still measure consumers' brand experience with criteria that are suitable for evaluating product and service marketing only (Maklan and Klaus, 2011). With the shift from fast moving consumer product brands to building customer relationships through service marketing, and lately to creating compelling consumer experiences, the measures for tracking consumer experiences should be updated (Maklan and Klaus, 2011). Experience refers to a broader context than product or service quality and thus the measure for it is more complex. Brand audits have also been promoted to study how consumers feel, think and act towards a brand and its products (Keller, 2013). A brand experience scale helps to track have the consumers' experience-related goals been achieved, however, only a few brand experience scales have been developed so far.

Chattopadhyay and Laborie (2005) created the Brand Experience Share (BES™) tool for calculating the level of marketing communication activity for different categories in order to check the share of impact that each contact is responsible for, which is also the perceived weight of all brand activities in comparison with the competitors on the market. The procedure for calculating the BES starts by identifying the contacts with the brand and the competing brands with the help of consumer focus groups, this is then followed by a quantitative analysis on how the consumers encounter the brands in the category.

The most extensive brand experience scale (BBX scale) has been developed by Brakus et al. (2009). They have done a conceptual analysis of brand experience and constructed a brand experience scale that measures sensations, feelings, cognitions, and behavioral responses to brand-related stimuli. They have conceptualized brand experience on four experience dimensions: sensory, affective, intellectual, and behavioral. These brand experiences can have varying strength, intensity, valence, and lengths and have an impact on consumer satisfaction and loyalty (Brakus *et al.*, 2009). Other brand constructs are clearly distinct from the brand experience construct as they are

evaluative, affective and associative such as: brand attitudes, brand involvement, brand attachment, customer delight, and brand personality.

The BBX scale items that have been selected in the final version of the BBX scale have gone through careful scrutiny (Brakus *et al.*, 2009). In order to find the appropriate brand experience dimensions, Brakus et al. did thorough literature review in philosophy, cognitive science and experiential marketing and management and came up with five experience dimensions that appeared from all of the literature: sensory, affective, intellectual, behavioral and social. When determining the actual items for the brand experience scale, Brakus et al. did a broader search and did not resort to existing scales in psychology, but instead selected items that focus on the degree to which the consumer have sensory, affective, intellectual, behavioral or social experiences with a brand, and not the actual content of the experience. Later the brand experience dimensions were reduced to four dimensions when the social dimension was omitted from the scale as it loaded on the same factor as the affective dimension. To ensure that this conceptualization of brand experience was also understood similarly by the consumers in their perceptions of brand experiences, Brakus et al. (2009) did a qualitative study with open questions for consumers.

The outcome of the various iterations for defining the items to be included in the BBX scale is a 12-item brand experience scale that measures in a reliable and stable way the four dimensions of brand experiences: sensory, affective, behavioral, and intellectual. The scale has been tested to verify that it is internally consistent and reliable, and even though it is related to some brand scales it is clearly distinct from them. The four brand experience dimensions included in the BBX scale are related to the big five dimensions of brand personality defined by Aaker (1997) in the a brand personality measurement scale, and the dimensions that constitute brand attachment (affection, connection, and passion).

In their study, Skard et al. (2011) have analyzed the dimensions in the BBX scale and they argue that a relational dimension should be included in the brand experience scale as a fifth dimension, especially in the case of service brands. Skard et al. have replicated the BBX scale in a service brand context for telecommunications brands. They used the four dimensions in the original BBX scale and in addition they extended the scale by a measure for relational experience by three items reflecting how a brand influences consumers' feeling of belonging to a community, a family or being left alone (Skard *et al.*, 2011). This relational dimension is closely related to the social dimension that Brakus et al omitted in the first phases of the development from the BBX scale.

The BBX scale measures mainly strength not valence even though certain items can be positively loaded. There are different views in literature whether experiences are all by definition positive always, or whether experiences can be either good, bad, or even indifferent (Skard *et al.*, 2011). Skard et al. (2011) consider there to be a poor

understanding of the concept of brand experience and how it can be measured due to the lack of empirical studies on how it effects, however, they regard the BBX scale to be the only one in marketing that has a basis in theory and has been empirically tested. The BBX scale is practical and helps to evaluate how the brand experiences relate to other consumer responses and also it allows to examine multi-dimensionally the components of total consumer experience. In the research of Skard et al. some experience dimensions proved to have negative associations with customer satisfaction and loyalty, which shows that experiences are not inherently positive concepts. Skard et al. also propose that brand experience measurement scales should also measure valence not only strength, by including positively and negatively worded items.

2.2.2.12 Brand Experience Related Measures

Many organizations are competing in the creation of customer experiences, and there are no widely agreed measures for them. Companies tend to be still stuck in the product and service level measurements, but customer experience cannot be understood in the terms of traditional definitions of products and services because in the experiencing the focus is on customers' value-in-use, that is the result of the combinations of products and services (Maklan and Klaus, 2011).

Experience accumulates to consumers as they have many different kinds of encounters with products and services across various channels. What needs to be taken into account in a customer experience measure is the synthesis of the multi-channel encounters that consumers have into an overall assessment of experience, and it is not just an individual service episode (Maklan and Klaus, 2011). An appropriate measure for customer experience according to Maklan and Klaus (2011) is based on an overall cognitive and emotional assessment of the value that a consumer actually gets, as it also captures the value-in-use of the offers which is more than the attributes of product and service delivery. The measure should also assess the emotional responses and functional delivery of the offer, and the measurement points should be at suitable spots before and after the service delivery so that the customers have time to assess the experience also across various channels (Maklan and Klaus, 2011).

Maklan and Klaus (2011) developed a measure for Customer Experience Quality (EXQ) including dimensions and attributes that explain the most important marketing outcomes: loyalty, word of mouth recommendation and satisfaction. The EXQ scale of Maklan and Klaus (2011) identifies attributes of the customer's experience that are most strongly associated with the marketing outcomes companies are targeting at. The scale has four primary dimensions with 19 corresponding items describing product experience, outcome focus, moments-of-truth, and peace-of-mind: *product experience* is the customers' perception of having choices and ability to compare offers; *outcome focus* refers to reducing customers' transaction costs, e.g. seeking out and qualifying new providers; *moments-of-truth* describe the importance of service recovery and

flexibility when the consumer faces unforeseen complications; p*eace-of-mind* includes emotional aspects of service and is based upon the perceived expertise of the service provider and their guidance provided throughout the process (Maklan and Klaus, 2011).

In the research of Lemke et al. (2011) experience quality incorporates, in addition to the evaluations of a company's products and services, also the encounters on the peer-to-peer and supplier levels. Lemke et al. (2011) stress the importance of understanding the consumer's perception of the experiences and realizing that the consumer's relation to a company is a process-like experience and also includes a network of suppliers, and many factors outside the company's direct control. EXQ is more than just service, it is also perceptual and very closely tied to a consumer's goals, and to achieve these goals the consumer does not consider perhaps some touch points with the company even to be relevant, and some categories of customer experience quality may not even have any consumer touch points with the company (Lemke *et al.*, 2011). Lemke et al. (2011) did not develop a measurement scale for the concept of customer experience quality.

It is important for the companies to understand consumers' experiences (Lemke *et al.*, 2011) and measure whether the consumers' goals have been achieved. One approach is to measure emotion in the consumer experience. Affective processes have been studied in consumer behavior and the focus has been on responses to advertising, also there has been research on emotions resulting from the consumption experience itself. There is a difference between emotions that are generated by advertising and those that arise during consumption, and many of the emotions generated by advertising are indirectly rather than directly experienced and consequently usually have a lower intensity (Richins, 1997). Advertising uses drama that can evoke the full range of feelings by consumers. In a consumption situation, the range of emotions is usually more restricted. Emotions can be created by the use of certain products or services, by one's favorite products, in different consumption situations. Advertising measures are used to evaluate interest, boredom, skepticism, and other cognitive responses, and these reactions are not so relevant to consumption situations (Richins, 1997).

Emotions are found to be an important factor in consumer response (Carroll and Ahuvia, 2006, Pawle and Cooper, 2006, Poels and Dewitte, 2006). Richins (1997) considers that earlier scales measuring emotions ignore some emotions that are important in people's lives, also none of the measures evaluate feelings of love, and the measures can focus on concepts that are not so familiar to consumers or are confusing. Richins (1997) has studied consumption-related emotions in consumer behavior, and assessed the usefulness of a set of Consumption Emotion Descriptors (CES). The CES includes a set of descriptors representing emotions that consumers most often experience in consumption situations (Richins, 1997). CES is a tool for assessing consumption-related emotions and it was developed to evaluate specific kinds of emotions experienced in consumption situations and it is able to distinguish the varieties of emotion associated with the different product classes (Richins, 1997). Emotions are

specific to a certain context, and the emotions that arise in interpersonal relationships differ in intensity and quality from emotions experienced when buying a product (Richins, 1997). Richins (1997) had the following objectives when developing a measurement approach: the measure has to cover the emotions most frequently experienced in many consumption situations, the emotions should be measured with a certain level of reliability, in addition the measure needs to be brief enough to be used in surveys so it does not assess all possible consumption emotions. In the measurement scale, the term ”consumption” refers to a broad spectrum of situations starting from the anticipation of the consumption situation, going to product acquisition, as well as actual possession and use of a product after the purchase (Richins, 1997).

Richins (1997) has defined consumption situations by the type of product consumed. As emotions are strongest when a product or the consumption situation is meaningful and important to a consumer, the focus has been on consumption situations where consumers are dealing possessions considered to be important or special in some way. Richins (1997) has grouped the possessions into three major categories: sentimental objects (gifts), recreational products (e.g. stereo equipment, mountain bike), and vehicles. The consumption activities involving these categories of objects differ and also the emotional experiences associated with them differ. The use or thinking of sentimental objects results most often in feelings of love and nostalgia and strong negative feelings are very unlikely to be experienced. The use of recreational objects is most often pleasurable, and the use of vehicles raise strong positive feelings as well as strong negative feelings due to the role of automobiles in society (Richins, 1997).

Romani et al. (2012) have studied emotions that drive consumers away from brands, and how to measure negative emotions toward brands and their behavioral effects. Negative and disadvantageous information on brands may appear especially from non-marketer-controlled sources of brand information that consumers are exposed to: commercial or non-partisan sources, word of mouth, and direct personal experiences, as well as anti-brand websites. Romani et al. (2012) consider that consumers' reviews of brand-related stimuli that are not directly related to the product or service attributes and performance originating from both marketer-controlled and non-marketer-controlled sources of information form the major sources of consumers' negative emotional responses that Romani et al. (2012) refer to as Negative Emotions toward Brands (NEB). The NEB scale includes 18 items describing the most commonly experienced negative consumers’ emotions towards brands. According to the findings of their research, worry about a certain brand has a positive association with switching to another brand, also consumers tend to switch to another brand or start spreading negative word of mouth rather than address the negative aspect by complaining to the company (Romani *et al.*, 2012).

2.3 Synthesis of the Theories

2.3.1 Brands as Criterion for Selecting Products

As the markets and marketing environment are evolving and changing constantly and consumers are becoming more demanding and savvier, and with the growing number of competitors there is a need to understand how consumers make their brand choices and how they perceive brands (Keller, 2003). Brands can be considered to some extent to be substitutable versions within a product category (Foxall *et al.*, 2010). Also the so-called matching theory (Herrnstein, 1997) can be applied in the classification and selection of products from the consumers' view point; the theory refers to the tendency of consumers to distribute their options between two possible choices according to the proportion of reward offered by the options. When consumers have earlier experience of a brand they have the capability to imagine what kind of a response it will create, those who do not have any experience of a brand cannot foresee the feelings and experience it will create for them (Hawkins and Mothersbaugh, 2010).

In order to understand how a consumer thinks in purchasing situations, we need to have an understanding of the content and structure of the brand knowledge in consumers' minds and what comes to their minds when they think of a brand as a result of any interaction with a brand, e.g. a marketing campaign (Keller, 1993). In modern consumer culture, brands also have role in portraying ideologies and social life, and consumers respond to images and metaphors assisting to portray their identities (Strizhakova *et al.*, 2011). Consumers are also using brands to build their identities based on brand meanings associated with status, personality, and communities, global brands offer the most of identity meanings as consumers view global brands as important and powerful means of communicating identity (Strizhakova *et al.*, 2011).

When making a decision people tend to do shortcuts in the information analysis stage and rely more on brand related information and the reputation of a company in order to ease their cognitive efforts and reduce the perceived risk (Brown *et al.*, 2011). Also when it comes to consumers having to learn and compare product attributes, consumers are reluctant to take risks on the brand attribute level and do not generally buy unfamiliar brands (Erdem and Keane, 1996). This finding is based on a study where Erdem and Keane (1996) constructed a theoretical framework describing consumers' decision making process under uncertainty, and they based it on the Bayesian learning framework describing how the probability of a brand choice is dependent on earlier use experiences and the advertisements the consumer has been in contact with.

Bettman and Park (1980) have researched the effects of prior knowledge and experience as well as the phase of the choice on the decision making processes of consumers. According to their findings consumers with moderate knowledge and experience

processed more available information than did the highly experienced or inexperienced user groups, and the more knowledgeable consumers had the tendency to reach their decision on the basis of brands. Consumers use attribute based evaluations in early phases of their choices and brand based evaluations in later phases of their choices . When eliminating the options within a range of brands, consumers may do comparisons on the attribute level against standards in an early phase of the choice process (Bettman and Park, 1980). Keller and Lehmann (2006) have also contrasted the classical microeconomics perspective that brands influence consumer choice through their utility value with a notion that considers the impact of brands is more than the utility value and its impact on perceptions.

When looking at the decision making process based on brands even though some brands may be preferred by loyal buyers, generally most buyers tend to do multi-brand buying so that they select their choice from a smaller subset of brands that they have used earlier and that they trust; however, the choice process and patterns for selecting a brand have not been yet fully explained by research (Foxall and James, 2003, Foxall and Schrezenmaier, 2003). The preferences of consumers are impacted by whether they compare brands directly (e.g. when doing a choice task) or whether they evaluate brands one by one (e.g. ratings of purchase likelihood) (Nowlis and Simonson, 1997). In the case of attributes that are easily available and easy to compare, such as the price, are usually very meaningful in comparison with tasks (Nowlis and Simonson, 1997). The more elaborate attributes, such as the brand name, that are more laborious and difficult to compare even though they are more meaningful and descriptive, generally get more attention when the consumers form their preferences based on separate evaluations in individual cases (Nowlis and Simonson, 1997). And in the case of brands with high equity value, promotions related to money have more of an impact for utilitarian products than for hedonic products (Chandon *et al.*, 2000).

It has been found that direct experience of a product or a brand has a greater importance and impact than advertising in the consumer decision making process (Hoch and Ha, 1986). However, in some cases where consumers have prior experience of a product or brand, an advertisement may help a consumer to confirm the claims in the advertisement for their own part which makes the advertisement an enforcing agent (Deighton, 1984). There have also been studies on how the various media and sources of information, including retail, word of mouth, and advertisements impact consumers' information search patterns and how the information is used in the decision making process (Klein, 1998), of which the information presentation format has been widely studied (Bettman and Kakkar, 1977), and also it has been studied in the context of the internet environment (Widing and Talarzyk, 1993). The internet has such information presentation capabilities that clearly have affected the decision making processes of consumers (Widing and Talarzyk, 1993) so that not only the final stage of the process is impacted but also the entire information search approach of consumers has change

with regard to the type of information they seek, the scope of the sources as well as the time put into the search (Klein, 1998).

Product information can be distorted before the decision is made (Russo *et al.*, 1998). Based on an experiment run by Russo et al. (1998), when the consumers get similar information on two made-up brands for only one attribute first, and then later for another attribute, the evaluation of the second attribute is distorted so that it is in line with the evaluation that has already helped to decide on the leading brand that is favored by the consumer. This kind of distortion and preference of a leading brand happens when the consumer does not initially have a brand preference (Russo *et al.*, 1998)

2.3.2 Brand Experiences as Criteria for Selecting Products

Consumer psychology is often a starting point for understanding how consumers interact with products and brands, and how they process brand-related stimuli and information. Schmitt (2012) has mapped the key brand constructs into a consumer psychology model of brands where the focus is not on the outcomes of brands with regard to choice, purchase, or loyalty, but on the psychological aspects that result in these outcomes. Schmitt's model describes consumer perceptions and judgments by concentrating on the processes with which they relate to brands with the focus on brand-level characteristics and not looking at product categories. The model takes into account the fact that brand-related information is handled by various senses, (i.e. through multi-sensory stimulation), and that brands can be anthropomorphized (i.e. ascribed with human form or attributes) and have brand personalities. Schmitt's model also takes into account that consumers know and experience brands on many levels and with various characteristics and may even belong to brand communities. The model distinguishes five brand-related processes: experiencing, identifying, integrating, signaling and connecting with the brand, and more specifically, the experiencing process means the sensory, affective and participatory experiences that consumers seek and experience with a brand, or the brand effect (Schmitt, 2012). When consumers engage with brands in an object-centered way, they pick up unconsciously multi-sensory stimuli of brands with their five senses (sight, sound, smell, touch, and taste) as they are available in a store or in advertisements (Schmitt, 2012). Humans perceive things through multiple senses, and recently research has started to study how senses work together and how another sense can give a cue to another sense (Schmitt, 2012).

Holt (1995) refers to consuming as an experience when he talks about the methods that consumers use to understand and respond to a consumption situation. Also Holt (1995) has created a typology to describe various consumption practices which distinguishes four different dimensions of consuming: experience, integration, classification, and play-to yield. The dimension referred to as a consuming-as-experience focuses on the subjective and emotional responses of consumers to the products they are consuming. There is also a sociological view of consuming as an experience and it focuses on

looking at consumption practices and the emotional responses linked to them (Holt, 1995). Consumers have their own interpretive frameworks that they use to engage with the consumption object (Holt, 1995). Holt's typology describing the consumption practices shows ways in which consumption experiences, integration, playing, and classification are interrelated. Consuming is never just an experience or an end in itself, instead consumers' relationship and activities related to consumption objects are more complex. Interactions with consumption objects are considered by consumers to be live experiences that can enlighten, bore, entertain as well as be a means for connecting closely to valued objects and resources that can be used to engage with others in order to impress, to befriend, or simply to play with others (Holt, 1995).

According to Hoch (2002), product experiences can seduce consumers so that they believe that they get more from the products than they actually do, because firstly, the experience is very engaging and vivid and thus more memorable, and secondly the experience is not perceived to be formal education nor just serving the interests of advertisers. Brands are meaningful tools for creating and reproducing the self, and as a consequence brand consumption experiences can be very complex (Fournier, 1998). From the individual consumer's perspective the experiences with the brand are so important and relevant to the consumers that they create personal brand systems that aid in their living and make their lives more meaningful, in other words, consumers do not actually select brands, but they select lives according to (Fournier, 1998).

In branding, stories have an important role in helping consumers to better remember brands, it can even be said that brand-related storytelling creates for the consumers' frameworks with the help of which they can organize their experiences and make them meaningful (Lundqvist *et al.*, 2013). The effects of stories in branding on consumer responses have been studied by Lundqvist et al. (2013), and they have focused on how the stories impact the consumers' brand experience. The findings indicate that a company's storytelling can be a powerful way of influencing consumer experiences: those consumers who were told the company's brand story, perceived the brand more positively and were ready to pay more for the branded product; this shows that brand stories can be a tool to create and strengthen positive brand associations (Lundqvist *et al.*, 2013). When stories are told well the story can have an impact on the consumers' brand experience so that it touches all the senses with the related brand stimuli included in the brand's design, identity, packaging, advertising and point of sales environment on the affective, intellectual, sensory and behavioral levels (Brakus *et al.*, 2009, Lundqvist *et al.*, 2013).

Customer experience is conceptualized as the subjective response of a customer to a holistic encounter with a company both directly and indirectly, and there is a high-level of customer experience quality in the encounter when the customer experience is considered to have a certain level of excellence or superiority (Lemke *et al.*, 2011). In the brand offering the experiential parts are more challenging for a company to keep in

control than the physical and textual aspects; to have a fully open experience means that the consumers generate it themselves individually or in communities (Pitt *et al.*, 2006). This is how also the brand sources are evolving from closed sources to open sources as consumers participate in the customization, are involved in brand communities and participating in creating experiences, and the distinction between company created and consumer created brand identities, brand images and reputations start to be hard to differentiate (Pitt *et al.*, 2006). Brand experience is a broader concept than customer experience, one needs to take a holistic approach to understand brand experience that happens regardless of the company's activities and offerings (Skard *et al.*, 2011).

2.3.3 Eco-friendliness as a Criterion for Selecting Brands

Consumers make their decisions among brands nowadays, not only based on functional and emotional criteria, but also how the company is taking care of its social responsibilities (Kotler, 2011). Sustainable consumption is linked to the philosophy of environmentalism which is defined behaviorally as the tendency to act with a pro-environmental motive (Stern, 2000). Phipps et al. (2013) define sustainable consumption as consumption that at the same time optimizes the results of the procurement, use and disposal on the environmental, social and economic levels to satisfy the requirements of present and future generations, and it is a global consensus that sustainable consumption is beneficial, critical and required, even though these attitudes are not always demonstrated in consumer behavior (Hawkins and Mothersbaugh, 2010). Environmental concern and behavior has already been linked to general theories of values and when the concern goes beyond an individual's personal social circle and are altruistic, the values are stronger among those who are involved in pro-environmental activities (Stern, 2000).

It is still unclear to researchers in environmental psychology, when and how a pro-environmental attitude actually leads to environmental behavior and when the context in which the person is results in pro-environmental actions and purchase choices (Whitmarsh and O'Neill, 2010). Environmentally significant behavior is something that an actor does with the motive to act so that it benefits the environment (Stern, 2000). According to Whitmarsh and O'Neill (2010), the self-identity of a person is a significant determinant of carbon offsetting behavior and much more so than the variables that have been identified in the theory of planned behavior. Values are important life goals or standards acting as guiding principles in a person's life, and they differ from attitudes or beliefs because they are considered to be an organized system and determine attitudes and behaviors (Schultz and Zelezny, 1999).

Today being an ecologically responsible consumer and behaving accordingly is difficult and even a complex ethical issue due to the complexity and perplexity of ecological information (Moisander, 2007, McDonald *et al.*, 2009, Young *et al.*, 2010) as well as lack of eco-friendly products on the markets (De Pelsmacker *et al.*, 2005a). Also

consumers do not trust the green marketing messages of companies (Hawkins and Mothersbaugh, 2010) and they lack easily understandable information on the eco-friendliness of products and brands (De Pelsmacker *et al.*, 2005a, Moisander, 2007). The consumers can get frustrated by the conflicting and complex environmental information they can access nowadays (Moisander, 2007), even though there is information available on the internet and the consumer marketplace is more transparent that several decades ago (Clemons, 2008). It has also be shown that when consumers are searching and purchasing high involvement products they consider and value less the products' environmental aspects and performance than when they are selecting low involvement products that they buy more frequently (Sriram and Forman, 1993, Young *et al.*, 2010). Also there is very little environmental information on small electrical appliances (McDonald *et al.*, 2009). Being a green and responsible consumer is difficult as a private lifestyle project as green consumers are still commonly expected to be conscientious decision-makers who carefully monitor all their purchasing selections and are aware of all the product options and also systematically reuse, reduce and recycle (Moisander, 2007). In the case of high-tech products, the consumer purchase decision making process with regard to eco-friendliness has not been studied by many, (McDonald *et al.*, 2009, Young *et al.*, 2010) are one of the few.

Green consumers consider environmental aspects in purchasing situations on a weekly level, and on a daily level they consider the environment by switching of lights and recycling waste (Young *et al.*, 2010). It is increasingly important and even vital for companies to be consistent in the production and delivery of products, listening to the consumer and customer needs, and even placing consumers and customers ahead of profit. Even though social debate can reduce customer satisfaction, positive social initiatives of companies tend to affect positively to how consumers perceive, evaluate their brands as well as increase customer satisfaction, customer loyalty and customer advocacy (Kashmiri and Mahajan, 2014). Companies that get involved in philanthropic initiatives in society during economic downturn may get more positive attention from customers and consumers in the form of positive brand responses, and improved customer satisfaction ratings due to the fact that they are showing humanity in hard times when customers and society are in need of compassion (Kashmiri and Mahajan, 2014).

There can be considerable inconsistencies in information on ESR activities communicated when one compares the reports of the companies, and other reporting parties and stakeholders (Siegel, 2009). Also, there is much to improve in the transparency of the ESR activities of companies, as consumers cannot easily find reliable corporate information on green and environmentally safe products and services (Ottman, 2011). Public ESR communication needs to be credible in order to have an impact, as transparency and concentrating on the consumers' perceptions is critical (Ottman, 2011). The ambiguity and complexity of environmental information provides consumers an excuse for denying their personal responsibility when making ethically

demanding choices. Motivational complexity in ecologically demanding situations demotivates green consumers and allows them to justifying un-ecological decisions, in addition some companies have resorted to exaggerated environmental claims in their marketing campaigns which has also turned consumers to be skeptical about the true eco-friendliness of green products and they have adopted different kinds of views on what is a so-called ecologically oriented consumer behavior (Young et al., 2010, Moisander, 2007).

When analyzing green marketing, one needs to have a critical socio-cultural perspective to understand how marketing practices help to construct green products that are meaningful to the consumers (Fuentes, 2014). Some marketing practices help to create a green moral which is linked to the marketed products by turning them to desirable consumption objects that can be used by consumers when they build their green identities (Fuentes, 2014). The trend where commercial products are associated with morality can be also interpreted as an indication of a more ethical consumer culture, however it can also be a sign of the development of morality and social justice being commercialized (Zukin and Maguire, 2004, Fuentes, 2014).

It is not enough that a product or service is just eco-friendly, it must also have features and attributes that are competitive on the product and service level compared to competitors, as consumers do not want to compromise on any important product benefits, for example, durability or convenience (Diamantopoulos *et al.*, 2003). As a consequence, companies need to be careful in the way they position and market their products and services, so that not only the environmental aspect is emphasized but also the product characteristics need to appeal to the consumers and buyers, which is why companies tend to resort to psychological or socio-demographic variables to design the positioning of the products and services (Diamantopoulos *et al.*, 2003).

Teisl et al. (2008) have studied how consumers react to eco-information provided on cars, and their results stress that the labelling needs to be well-designed as they impact considerably the consumers' perceptions of the eco-friendliness of the products. In addition, they highlight the importance of the long-run provision of eco-information to consumers, especially when consumers may have incorrect perceptions on the eco-friendliness of the products. One of the issues in the case of ESR initiatives is that consumers may have a hard time to objectively decide if the operations of a company comply with their personal and public standards for ESR activities (Siegel, 2009). In addition, there is distrust towards the producers, which is the reason why eco-friendliness is not necessarily used as a criterion at the moment when selecting products and brands (Moisander, 2007), which the case for small electrical products (McDonald *et al.*, 2009).

One theoretical model of sustainable consumption builds on the social cognitive theory (SCT) and views sustainable consumption to be interactive and refers to personal,

environmental and behavioral factors of consumption and reciprocal determinism, according to which personal, environmental and behavioral factors create a feedback loop that influence each other (Phipps *et al.*, 2013). There are two other commonly referenced models that show how expectancy-value incorporates morality based values (e.g., altruism) to explain sustainable consumer behaviors focusing on environmental issues (Phipps *et al.*, 2013): the Values–Beliefs–Norms (VBN) model of Stern (2000), and the Motivation–Opportunity–Abilities (MAO) model of Ölander and Thogersen (1995).

The value-belief-norm (VBN) theory of environmentalism introduces some behavioral indicators of non-activist environmentalism by linking value theory, norm-activation theory, and the New Environmental Paradigm (NEP) perspective (Dunlap, 2008) with five variables leading to behavior (Stern, 2000). These include personal altruistic values especially an ecological worldview, beliefs about the general conditions in the biophysical environment, and personal norms for pro-environmental action. The results of the research of Stern (2000) and his research team support the VBN theory's assertion that the personal moral norms of an individual are the main basis for individuals' general dispositions to act in a pro-environmental way, and also that the role of the environmental dispositions can be very different depending on the behavior, the actor and the context. The main assumption of the VBN theory is that pro-social beliefs and personal moral norms can be used to predict pro-environmental behavior (Stern, 2000, Phipps *et al.*, 2013). Jansson et al. (2011) have studied how consumers adopt eco-innovations using the VBN theory. They looked at how alternative fuel vehicles which run on fossil oil-alternative fuels were adopted, and found that early adopters had a higher level of education and they lived more often in multi-person households than non-adopters. Also in the case of attitudinal factors, the adopters indicated more pro-environmental values, beliefs, and personal norms (Jansson *et al.*, 2011).

The Motivation Opportunity Abilities (MAO) model is based on the motivational orientation of the VBN theory, and it incorporates ability and opportunity to recognize possible restrictions and facilitators of sustainable behaviors (Ölander and Thogersen, 1995). From the ability perspective, a consumer may have resource restrictions when it comes to time, money, cognitive capacity, or skills to manage a sustainable lifestyle (Ölander and Thogersen, 1995, Phipps *et al.*, 2013). And from the opportunity perspective there may be restrictions structurally, so that efforts to reducing energy consumption or recycling is impacted by the non-existence of required infrastructure and facilities as well as the sustainable options that are not too expensive or laborious to find when comparing to more common offerings (Ölander and Thogersen, 1995, Phipps *et al.*, 2013).

Stern (2000) has divided environmentally significant behavior into various types so that there is: 1) environmental activism for committed individuals, 2) the non-activists in the

public sector who are environmentally concerned, support and approve environmental regulations, 3) private-sphere environmentalism where people consider the environmental impact in the purchase, use and disposal of personal and household products, and in the 4) other environmentally significant behaviors within the context of other organizations where individuals work and have an impact in. Within the scope of private-sphere environmentalism there are also such purchase decisions on major technical devices, such as automobiles and household appliances, as well as smaller consumer electronics that have a larger environmental impact than other purchase decisions (Stern, 2000). Also eco-friendliness is a trait that an increasing number of consumers are starting again to take note of and also consider when making their purchase choices even though the trend of green consumerism is not anymore as high as in the 1990's necessarily (Lester, 2009).

So-called non-green criteria and consumers' habits and desires decrease the impact of green criteria in the decision-making process during the purchase situation (Young *et al.*, 2010). The non-green criteria for selecting a product on the other hand form a barrier to prioritizing an environmental product selection; these non-green criteria include: opting for a recognized and specific brand, the size of the product, price, information source, former product experience, reliability, model and type, appearance, design, color, serviceability, retailer choice, delivery length and costs (Young *et al.*, 2010). Green consumers consider eco-labelling, guidance from experts, availability of green products in major retail stores as well as personal guilt to be strong green criteria that impact in the purchase situations, while the major barriers to green purchasing are lack of time to study the product information, high prices of green products, lack of information and extra cognitive effort required in the purchase situation (Young et al., 2010, McDonald et al., 2009). The purchase experience and knowledge gained during a purchase vary each time, including the possible guilt if the consumer is not purchasing the greenest product, and these influence back to the consumer's general green values and knowledge which will have an impact in the next purchasing situation (Young *et al.*, 2010).

Consumer research and consumer psychology focuses on behavior in the private sphere, i.e. studying the purchase, use, and disposal of personal and household products that have environmental impact. Pro-environmental behavior can be divided according to the type of decision made in association with it: 1) the purchase of major household goods and services that have an environmentally significant impact (e.g., cars, energy consumption at home, holiday travel), 2) the use and maintenance of environmentally important goods (e.g. heating and cooling system in homes), 3) household waste disposal and green consumerism (buying practices taking into account the environmental impact of production processes reflected in e.g. purchasing recycled products and organically grown foods) (Stern, 2000). With this division Stern (2000) notes that some kinds of choices, e.g. car purchases and major household appliances that are done infrequently usually have a larger environmental impact than other kinds of purchases.

Young et al. (2010) have investigated the purchasing process of green consumers in the case of technology products in the UK and they developed a green consumer purchasing model and some success criteria to be used to decrease the gap between the consumers' values and their behavior. They came to the conclusion that incentives and labels, for example, the energy rating label, help consumers to concentrate on green consuming, as being a green consumer requires extra time and energy from the consumers that may have very active lifestyles. Young et al. (2010) also found that the most common green criteria impacting their decision making process in a purchasing situation when selecting a technology-based product were: the environmental performance of the product, (e.g. energy efficiency, durability), product manufacturing (recycled materials, chemical content and repairability), and finally second-hand availability.

Akehurst et al. (2012) have examined the determinants of Ecologically Conscious Consumer Behavior (ECCB) by analyzing the green consumer profile. They found that psychographic variables, and especially perceived consumer effectiveness (PCE) and altruism are more relevant than socio-demographic variables when trying to explain ECCB. Also, based on their findings Akehurst et al. (2012) conclude that consumers with higher ECCB show higher green purchase intention (GPI). ECCB has a positive impact on green purchase behavior. Barr and Gilg (2006) have studied environmental behavior in the context of: (1) everyday consumption behavior that presents itself as environmental actions and (2) different segments of the population that form lifestyle groups who follow these practices. Their findings present how actions to help the environment are included in everyday practices and framed by the different lifestyle groups.

In the automobile industry, the relevance and pressure to adopt green solutions in new car models will most probably increase, and not only due to the decline of resources, but also as a result of consumer demand (Kim, 2011). Hetterich et al. (2012) found in their research that more than 66% of potential car buyers would be willing to pay a moderate extra sum for green car components. The level of environmentally significant behavior of an individual can also be affected by non-environmental attitudes toward attributes of consumer products that are correlated with environmental impact (e.g., speed and power in automobiles), or luxury, waste, or family-oriented activities (Stern, 2000).

In the case of small electrical appliances, it has been shown that brand is the most significant criterion for the consumers in the decision making process, and eco-friendliness or sustainability is seldom studied in these purchase contexts even by the dark green consumers (McDonald *et al.*, 2009). The reason for this may be that there are no eco-friendly options available for consumers in the case of small consumer electronics or electrical appliances on the market at the moment, and consumers are also lacking the information on the eco-friendliness of these options. Currently, for the dark green consumers the options when buying small electrical appliances are: to not buy anything at all, or to buy a second-hand device, or then buy from a small local retailer

(McDonald *et al.*, 2009). It is only the dark green consumers who are prepared to purchase and pay even more for green products when the product is not offering the same qualities as the non-green product (Ottman, 2011). However, a green product offering can still have some advantage over a so-called conventional attribute of a product even for a wider group of average consumers if the product has the same quality and characteristics as the non-green product options (Beinhocker *et al.*, 2009).

2.3.4 Developing a Scale with Eco-friendliness as an Attribute of Brand Experience

There are different complementary measurement scales used in research that have been used to monitor consumers' relationships with various brand constructs, such as, for example, brand personality (Aaker, 1997), brand beliefs (Barnard and Ehrenberg, 1990), brand attitudes (Barwise and Ehrenberg, 1987), as well as to measure consumers' environmental concern, such as the NEP scale (Dunlap, 2008). Schultz and Zelezny (1999) refer to the environmental attitude measurement scale of Thompson and Barton (1994) that measures two value-based environmental concerns: eco-centric concern concentrates on the intrinsic values of the ecological world of plants and animals, while anthropocentric concern is concerned about what kind of effect environmental damage will have on the life quality of the human population. The degree to which people are sensitive to climate-change issues, are knowledgeable of clean energy and alternative energy options, as well as energy conservation can be considered to be explicit dimensions of environmental concern (Hartmann and Apaolaza-Ibanez, 2012).

There is also research on the influence of consumers' concern for the environment to their consumption behaviors, and several studies confirm that the consumers' environmental concern influences how they purchase eco-friendly products (Diamantopoulos *et al.*, 2003, Teisl *et al.*, 2008, Young *et al.*, 2010, Akehurst *et al.*, 2012, Hartmann and Apaolaza-Ibanez, 2012). In addition, the findings of Chen (2010) on green brand equity indicate that investing in activities that increase the green brand image, green satisfaction, and green trust would also improve the green brand equity of a company. The relationship of consumers with green brands has not been studied in depth (Papista and Krystallis, 2013). Papista and Krystallis (2013) have applied the customer value concept in association with green marketing to analyze what factors motivate or prevent the development of relationships between consumers and green brands, and they examined how consumers adopt green brands and how the consumers' relationship with green brands develop, also taking into account situational and brand offering factors. The framework of Papista and Krystallis (2013) reveals the role of a brand's eco-performance as one type of economic value, where the link between eco-performance and functional performance of a green brand helps managers to acquire information on the motives of consumers with regard to green brand choices. They looked at factors that show how the relationship between consumers and green brands

develop, however, the framework is rather complex and only conceptual and it does not use any quantitative data from consumers on their perceptions of various brands so that the results could be compared.

There is a gap in the research of measuring the eco-friendliness of consumers' brand experiences. In the high-tech industry, companies do not currently have the means to track how their consumers experience their brand with regard to eco-friendliness, and they do not even know what kind of consumers consider this as one of the criteria or dimensions of the brand when they encounter, use or experience their brand. Still today, one of the top trends in the consumer markets is green consumerism, eco-friendliness and social responsibility, and this has already been responded to in the fast-moving consumer goods sector and white consumer electronics for households (McDonald *et al.*, 2009) as well as in the automobile industry (Kim, 2011). And in the future, eco-friendliness could be one of the key selling points for consumer electronics and high-tech products in the case of some green consumer groups (Ottman, 2011). Also for the high-tech companies it is vital to maintain their reputation intact with regard to ESR requirements and activities (Diamantopoulos *et al.*, 2003, Grimmer and Bingham, 2013).

There is a need to create more tools and scales for tracking consumers' experiences on the eco-friendliness of brands. So far there has been very little research in the way eco-friendliness could be included in brand measurement scales of consumer brand experiences. There are only a few researches that have included the dimension of social responsibility or eco-friendliness into their research on brands. (Madrigal and Boush, 2008), have studied social responsibility as a dimension of brand personality based on the brand personality scale and five dimensions of Aaker (1997), and have concluded that it is a unique brand personality dimension that can be conceptualized in terms of the brand's obligation to society. The model also included a moderator of the Social Responsibility (SR) effect, the consumers' willingness to reward the brand for its environmentally friendly actions and products, and they found as they had hypothesized, that the impact of SR was emphasized and the consumers' willingness to reward company became higher. Madrigal and Boush (2008) interpreted this so that consumers are willing to reward a brand for its good deeds.

Sweetin et al. (2013) extended the research of Madrigal and Bousch (2008) and it was the first research on CSR that used the SR brand personality dimension created by Madrigal and Bousch (2008) and their research also partly replicated and extended the research on brand personality dimensions. According to Sweetin et al. (2013), consumers form psychological contracts with corporate brands they trust in, and if they somehow get the perception that they can no longer reach their personal targets in their identity projects with a certain brand, they are prepared to punish the company and the brand, and this is also valid in the case if a corporate brand turns out to be socially irresponsible.

The product area selected for this research is in the high-tech sector, because in the case of high-tech products eco-friendliness has not yet been used as a selling point to the consumers, even though most high-tech companies already have ESR related development and activities, but they have not been publicized to the consumers very actively yet. However, there is clearly still the trend of green consumption that is also impacting the high-tech markets with regard to, for example, energy efficiency of house appliances and consumer electronics (McDonald *et al.*, 2009) .

Scale Development: Domain Specification and Item Generation for an Extended BBX Scale

The way experiences are dependent of the individual and situational factors (Holt, 1995, Fournier, 1998, Brakus *et al.*, 2009, Schmitt, 2012) makes the development of an experience measurement scale a complex matter. Firstly, the context of any experience is usually complex and there are many possible variables that can be conditioned either individually or in different situations; secondly, experiences are non-linear so that a new factor in the experience may have a positive effect that can wear out when it is repeated several times; and finally, it is difficult to understand what is an optimal level for an experience and whether experiences are inherently positive or whether they should have a valence scale with positive-negative-neutral options (Skard *et al.*, 2011). Situational factors include anything related to the selling point, its location, the facilities, even culture, economic climate and season, and individual consumer related factors include the type of goals the consumer has, socio-demographics, cultural background, earlier experiences, mood, personality traits as well as consumer attitudes (e.g. Lawson, 1997, Bettman *et al.*, 1998, Rajala and Hantula, 2000, Yankelovich and Meer, 2006, Brakus et al., 2009, Hawkins and Mothersbaugh, 2010).

The first step in the process for creating better measures with marketing research is to define exactly what the measured construct is as well as the construct domain (Churchill, 1979). The concept of eco-friendliness in the context of brands has been understood here to be something that is not harmful to the environment (Merriam-Webster, 2015, OxfordDictionaries, 2015). When referring to sustainable consumption, the presumption is that the production and consumption habits are eco-friendly. People with sustainable or green consumption habits take into account ecological and ethical qualities of the consumer goods that they purchase and use (Stern, 2000), however, so-called pro-environmental behavior is not always necessarily motivated by environmental concern, consumers may also take action in order to save energy instead of being concerned for the environment for climate change, also saving energy seems to be mostly motivated by financial or health benefits more than due to being environmentally conscious (Whitmarsh and O'Neill, 2010). The eco-friendliness construct in this research can be considered to be both a conceptual ideal that portrays how a company wants the consumers to perceive their brand, i.e. representing a traditional brand management view (Keller, 2013), and an empirical presentation that

tries to capture how consumers actually perceive and experience the brand including its eco-friendliness, i.e. representing a more open view of a brand where brand producers and consumers together create a brand even on the physical and experience level (Pitt *et al.*, 2006).

When formulating the items for the eco-friendliness construct, the aim was to investigate whether consumers also consider eco-friendliness in the context of general brand experiences. The four dimensions in the BBX scale were used as the basis for describing the eco-friendliness construct as they have already been proven to be in the general BBX scale and to represent the brand experiences of consumers. In this study, it was tested whether these dimensions can also be applied in the eco-friendliness construct in association with brand experiences. The four brand experience dimensions in the BBX scale are distinct ways how consumers experience brands. And accordingly, also eco-friendliness is broken in this research into consumer traits on the affective, behavioral, intellectual and sensory levels. The items for the eco-friendliness construct were formulated on the basis of the following thinking presented below.

1) The **sensory level** is an important aspect in the context of eco-friendliness, i.e. consumers can have experiences, for example, in which the physical appearance of brand-related stimuli have given an impression on the eco-friendliness of the brand. Schmitt's model of brands (2012) in the field of consumer psychology takes into account that brand-related information is handled by various senses, (i.e. through multi-sensory stimulation). It is also considered to be critical how consumers view, hear and like the touch of products (Pine and Gilmore, 1998). The sensory dimension is also critical with respect to especially green products as the look and feel of eco-friendly products very often differs from the competing mainstream products as they have been made from materials that are different, such as low impact or recycled materials; also the use of material is reduced to minimum according to the eco-design strategies that take into account the impacts of the product during its full life cycle (Vallet *et al.*, 2013).

2) The **affective level** is a very critical element to consider in the overall experience of eco-friendliness as there are emotions involved in the consumption situations (Richins, 1997) as well as experiences of products (Holt, 1995). Consumers also have very personal and subjective internal responses to brand-related stimuli that raise sensations and feelings (Fournier, 1998). In association with green energy advertisements it has been shown that consumers can get feelings of warm glow as a result of the self-satisfaction that they feel when they support a common good cause for the environment (Hartmann and Apaolaza-Ibanez, 2012).

3) The **behavioral level** in the context of eco-friendliness refers to how the consumers consider the brand to support or boost their eco-friendly behavior. When consumers are in contact with brand-related stimuli the responses can also have an impact on

their behavior (Fournier, 1998). If a brand helps consumers in their personal identity-building projects (Keller, 1993, Aaker *et al.*, 1995, Stokburger-Sauer *et al.*, 2012) and allows them to behave in an eco-friendly way and to also show that they belong to a certain lifestyle group that is ecologically conscious, it is a crucial feature of a brand when considering the eco-friendliness of a brand experience (Yankelovich and Meer, 2006).

4) On the **intellectual level** consumers may think about the state of the environment when they encounter a brand. Traditionally in marketing, consumers have been considered to be rational decision makers, however, as marketing research has evolved it has been also understood that there are in addition other characteristics, such as emotions or personal goals that have an impact in the consumers' decision making process (Lawson, 1997, Bettman *et al.*, 1998, Foxall, 2007). Still, the cognitive considerations of a consumer have an effect on their behavior, even though emotions may also have an impact (Punj and Stewart, 1983). With the online environment consumers have learnt to search for information and they are interested in product attributes or the opinions of other users before a purchase (Peterson and Merino, 2003). When consumers need to make major purchase decisions concerning larger technical devices, such as automobiles or household appliances, as well as smaller consumer electronics that have a larger environmental impact than other purchase decisions, some consumers also consider product or brand related information, for example: the environmental performance of the product, (e.g. energy efficiency, durability), product manufacturing (recycled materials, chemical content and repairability), and possibly second-hand availability of the branded products (Young *et al.*, 2010).

All of these four aspects together form a comprehensive eco-friendly dimension that brings together all the aspects in which a consumer experiences brands and products. The further development of the BBX model started by the creation of the additional items of eco-friendliness in the scale. In the purification phase of the scale, the eco-friendliness items in the measurement scale were formulated with reference to the existing four dimensions in the BBX scale to enable the verification whether the eco-friendly attribute is actually something that the consumers associate already with the existing four brand experience dimensions, or whether it is a fifth dimension in the BBX measurement scale. The wordings of the items for the questionnaire were formulated following the logic of the original BBX model in the following way:

- Sensory: This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)
- Affective: This brand creates eco-friendly emotions
- Behavioral: This brand makes me behave in an eco-friendly way
- Intellectual: This brand makes me think about the state of the environment

The four items on eco-friendliness were included in two extended conceptual BBX models developed from the original BBX model in this study: one had the items on eco-friendliness included in the original four dimensions so that one corresponding eco-friendliness item was added in each of the dimensions. And in the second extended model, the items on eco-friendliness formed together a separate dimension of eco-friendliness. The questionnaire was pretested in order to verify that all of the items were understandable. A seven point Likert scale with an eighth option for “Do not know” was used. The questionnaire was distributed by the internet to the respondents and they were allowed time to respond to it in privacy, so the results are expected to be very honest and they depict the respondents’ true view on the eco-friendliness of the mobile phone brands included in the survey. The more detailed findings of the survey and research will be described below in the next chapter.

3 RESEARCH METHOD AND DATA

This chapter describes the research design including details on the sampling, data collection as well as analysis methods. In addition, the measurement related topics on item selection for the questionnaire as well as the validation of the measurement model are covered.

3.1 Conceptual Modelling and Research Questions

The section below concentrates on presenting the conceptual models and research questions that have been formulated to test the models in this research. As this research is a replication and extension of the research of Brakus et al. (2009) the measurement model was based on their four-factor brand experience model. The BBX scale measures brand experience on four dimensions: sensory, affective, intellectual, and behavioral. However, the scale does not include any reference or items on eco-friendliness.

The first conceptual model in this study replicates directly the four-factor BBX model. The main research question related to the four-factor model is whether the brand experience of high-tech products, and especially mobile phone brands, consists of the same four brand experience dimensions presented in the BBX model and is the model sufficient for analyzing the data collected in this research without the eco-friendliness items. The original items in the BBX measurement scale are presented below in table 2.

Table 2. The original items from the four-factor BBX model

Sensory	This brand makes a strong impression on my visual sense or other senses.
	I find this brand interesting in a sensory way.
	This brand does not appeal to my senses.
Affective	This brand induces feelings and sentiments.
	I do not have strong emotions for this brand.
	This brand is an emotional brand.
Behavioral	I engage in physical actions and behaviors when I use this brand.
	This brand results in bodily experiences.
	This brand is not action oriented.
Intellectual	I engage in a lot of thinking when I encounter this brand.
	This brand does not make me think.
	This brand stimulates my curiosity and problem solving.

In addition to the original twelve items of the BBX model, four items on eco-friendliness were designed for the survey, one for each of the four dimensions, the sensory, affective, behavioral and intellectual dimensions. In the two extended conceptual models developed in this study, the four items on eco-friendliness were included in original BBX model Two variations of an extended model were constructed: one had the items on eco-friendliness embedded in the original four dimensions, and in the other extended model a fifth new dimension having only items on eco-friendliness was constructed.

The eco-friendly items are listed below.

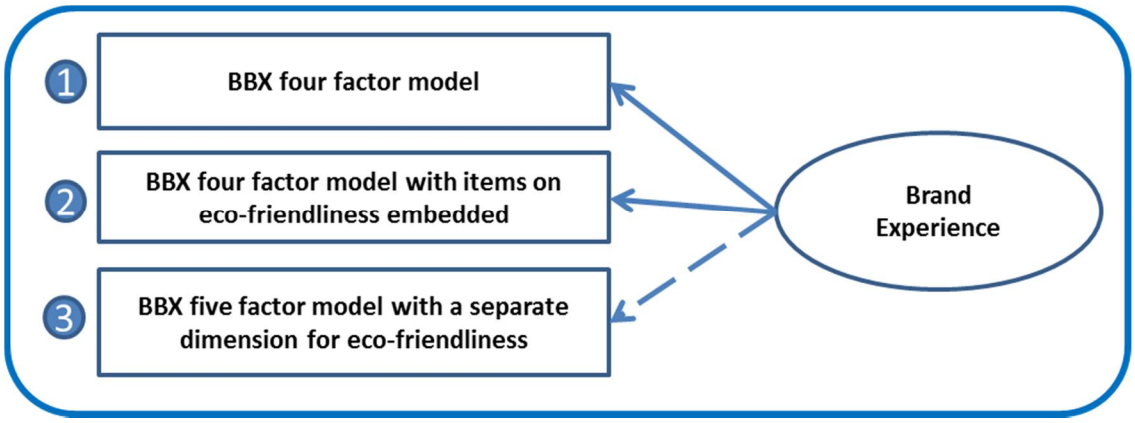
- Sensory: This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)
- Affective: This brand creates eco-friendly emotions
- Behavioral: This brand makes me behave in an eco-friendly way
- Intellectual: This brand makes me think about the state of the environment

The reason why a statement on eco-friendliness was formulated for each of the four dimensions from the original four-factor BBX model was to enable the testing of whether the eco-friendly attribute is associated with and incorporated in the existing four brand experience dimensions or not, or whether it is a totally separate dimension of its own. As it had already been attested with the original BBX model that brand experience is measurable on four dimensions, it was important to see if eco-friendly attributes would fit the same conceptual model. In this study, the items on eco-friendliness were also formulated following the division into four dimensions following the logic of the original BBX model.

The research questions designed to test the three operational models are the following:

1) Can the original four-factor BBX model be replicated with a data set on high-tech brands collected from Finland?
2) Is the eco-friendliness dimension embedded in the four-factor BBX model?
3) Is the eco-friendliness dimension a separate fifth dimension requiring that the original four-factor model is extended into a five-factor model?

Figure 1. Conceptual models tested in this study



3.2 Research Design

The design of the research starts by explaining how the sampling has been done, how the data was collected and how well the sample represents the whole population. In association with the description of the data collection methods, the development of the questionnaire is also covered.

3.2.1 Sampling

The target of the sampling for the actual online survey was to have the respondents represent a wide consumer group who actively use and buy high-tech products, or in this case mobile phones. The mobile phone has become a permanent commodity in peoples' lives and the usage covers all age groups in nearly all of the households in Finland. The official national statistics on consumers indicated that in August 2013 of all households in Finland 84% had only a mobile phone, 15% of the households had both a mobile phone and a landline phone, and only 1% of all of the households had solely a landline phone. (Official_Statistics_of_Finland, 2013a).

The data was collected in the form of an online web survey in autumn 2013. The respondents were approached with a market research company via an internet-based sampling frame to ensure that a representative sample of population is included in the survey. The age of the respondents ranged from 18-64 years. The data extracted and analyzed for the purpose of this study consisted of 506 respondents from Finland. The place of residence of the respondents was also tracked to ensure that the respondents were distributed evenly across the country similarly as the whole population of Finland is distributed. The representativeness of the sample was validated against the age distribution of the present population in Finland with reference to their place of residence based on the official statistics of Finland maintained by the Statistics Finland organization, which is the Finnish public authority specifically established for statistics.

3.2.2 Data Collection

The data collection method in this consumer research was a web survey that was sent out in an e-mail to 4681 people living in Finland. The survey was open for the respondents from the 19th of Sep to the 4th Oct 2013 in Finland. As a token of appreciation, all the respondents had the possibility to participate in a lottery with a prize of 100€.

The survey questionnaire was done on the basis of the original questionnaire used in the research of Brakus et al. (2009). One clarifying addition was made to the three statements under the sensory dimension: the five senses were listed in parentheses at the end (sight, touch, hearing, taste, and smell) to ensure that this statement was fully understood by the respondents and could also be translated accurately into another language. In addition to the original twelve statements of the BBX model, four additional statements on eco-friendliness were designed for the survey. All of the statements were repeated for five major mobile phone brands used globally: Nokia, Samsung, Apple, Sony and hTc. In the actual survey, the order of the questions for the five brands was random and rotated in order to avoid any ordering effects in the responses.

The questionnaire was pretested with a small group (N=7) of respondents representing the middle-age category in the target age group (25-54 years) with varying educational backgrounds, different nationalities (Finnish and Indian), and four of the respondents were male and three were female. In the pilot survey, the response options were according to the 7-point Likert scale and the options were anchored only at the ends of the options, at the response options 1 and 7. When answering the pilot survey, one of the respondents requested for a new copy of the questionnaire as the person did not understand the ratings in the scale especially for the negative statements that the person wanted to disagree with. Also for one respondent some of the answers were not logical when comparing the negative statements to the positive statements. On the basis of the results of the pilot survey, some of the statements on eco-friendliness were also slightly reformulated and all of the numerical response options were anchored to a worded response. The anchoring of all of the response options clarifies the response options and reduces the possibility to misinterpret the numerical options and thus enables the respondents to find the correct answer in a more reliable way.

In the pilot survey, a few of the respondents answered with the rating 4 to all of the statements for some brands which was interpreted so that this person probably did not know these brands. The neutral option seems to have been used by some of the respondents as an option to indicate that the respondent does not have any experience of the brand and really does not know what else to answer. Based on this response style, an eighth option “Do not know” was added in the response options. The “Do not know” option has also been included in brand image measurement surveys (Dolnicar and Grun,

2014). In the online web survey, the respondents are not given the possibility to skip a question or a brand, instead the option "Do not know" needs to be selected in order to be able to proceed to the next brand which is on the next page of the survey. This eighth option also allows the respondent to be honest about their experience and to avoid conflicting statements that came up in the pilot when one of the respondents had selected the option "I do not use the brand", but has still added a rating for the statement "I engage in physical actions and behaviors when I use this brand."

In the actual survey, all the numerical options of the 7-point Likert scale were anchored to a written response, and also there was an 8th option "Do not know". The following wordings were used to anchor the numerical options: 1= Strongly disagree, 2= Disagree, 3= Somewhat disagree, 4= Neither disagree nor agree, 5= Somewhat agree, 6= Agree, 7= Strongly Agree, 8= Do not know. The eighth option "Do not know" helps respondents to go on answering the questions even though they do not have the kind of experience called for in the statement. The option 4 in the 7-point Likert scale worded as "Neither disagree nor agree" option is a neutral response, which can also indicate that the person has some kind of an experience of the brand, but that s/he does not have a strong stand to the statement. On the other hand, when a respondent answers that s/he does not know something, it is a clear indication that the person does not at have the experience and is not able to evaluate whether the statement applies.

The questionnaire and response options were translated into Finnish by an experienced translator, and to ensure translation equivalence the translation was checked by a qualified English teacher at the Tampere University of Technology. The e-mail survey was sent to 4681 people, of which 814 recipients opened the questionnaire, and 506 completed the questionnaire. The response rate calculated from all of the invitations sent to participate in the survey is 10.8%. From all the opened questionnaires, 62.2% were completed. The share of Finland's population aged 16 to 74 that had used the Internet in 2013 in the past three months was 92% of the whole population (Official_Statistics_of_Finland, 2013b).

Overall the response representativeness is considered to be more relevant than the response rate in survey research, and the response rate is only important if it has an effect on the representativeness (Cook *et al.*, 2000). For certain populations, e-mail and Web surveys may have only minor coverage problems. Response rates for e-mail surveys tend to be lower than for traditional mail surveys (Cook *et al.*, 2000). Some individuals have reached a point where they do not read all their e-mail messages and they may resist to being reminded about a survey, if they receive too many reminders (Cook *et al.*, 2000) The response rate results of offline surveys cannot be generalized for online surveys (Deutskens *et al.*, 2004). It is worthwhile conducting even long and elaborate surveys over the internet, if respondents are adequately rewarded (Deutskens *et al.*, 2004). The types of population participating in the survey has an impact on the variation of response rate differences between Web and mail surveys, so that for college

populations, Web survey response rates can be higher than for mail surveys, and for other populations (e.g., professionals, employees, and general population), Web survey response rate can be lower than the mail survey response rate (23%, 10%, and 13% lower, respectively, for the three population types) (Shih and Fan, 2008). The meta-analysis of Web and mail survey modes done by Shih and Fan (2008) indicates that for Web surveys the response rates are about 10% lower on the average than for mail surveys and that the population types can statistically account for some of the variation between the Web and paper survey response rate differences. From the 39 web surveys analyzed by Shih and Fan (2008) 10 had a response rate of under 15%, which is one fourth of all the analyzed surveys. Based on this, it can be stated the response rate for the current survey was good enough.

3.2.3 Representativeness of the Sample

The representativeness of the sample is validated against the distribution of gender and age of the present population in Finland. Table 3 shows how the respondents are distributed demographically according to gender. To verify that the data set is a representative sample of the whole population, the corresponding figures for the demographics of the whole country are listed in the table beside the figures of the data set.

In the sample 46.6% were females and 53.4 were males. The target would have been to have close to 50% - 50% ratio. However, based on the results of binominal tests it can be said that the sample is representative for gender (See Table 3).

Table 3. The distribution of genders in the survey

Gender	**Respondents**		**Population of Finland in 2013**
Female	236	46.6 %	50.8 %
Male	270	53.4 %	49.2 %
Total	506	100 %	100 %

Binominal test: Exact Sig. 1-tailed = .034

The distribution of the respondents in the age groups represents the age distribution among the whole population of Finland ideally, the very small differences range between 0,21% - 0,8% (Official_Statistics_of_Finland, 2014a). The fit of the sample in comparison with the overall population of Finland was very good as the residuals indicate in the Table 4 below.

Table 4. The distribution of different age groups in the survey in comparison with the population of Finland in 2013

Age	Data set N	%	Population in Finland	Residual
18-24	68	13,4 %	14,2 %	- .8
25-34	104	20,6 %	20,8 %	- .2
35-44	102	20,2 %	19,8 %	.4
45-54	116	22,9 %	22,4 %	.5
55-64	116	22,9 %	22,8 %	.1
Total	506	100 %	100 %	

The respondents are from four different regions in Finland and the coverage corresponds to the distribution of the population in Finland (Official_Statistics_of_Finland, 2014b) fairly well as the differences are ranging from 2,4% - 6,7% as indicated by the residuals as presented in Table 5 below.

Table 5. The distribution of respondents according to their location in comparison with the population of Finland in 2013

Region in Finland	Data set		Population in Finland	Residual
Helsinki area	150	29,6 %	25,3 %	4.3
Rest of Southern Finland	114	22,5 %	29,2 %	- 6.7
Western Finland	132	26,1 %	21,4 %	4.7
Northern and Eastern Finland	110	21,7 %	24,1 %	- 2.4
Total	506	100,0 %	100 %	

3.2.4 General background on the respondents

All of the respondents replied to the same questions for the five mobile phone brands in the survey. Three brands were selected to be analyzed in this study from the five brands included in the web survey, due to the fact that the majority of the respondents, 65.8%, owned a Nokia/Lumia branded mobile phone, a Samsung mobile was owned by 17.4%,

and an Apple branded mobile phone as owned by 9.3% of the respondents. Only 6.3% of the respondents had a mobile phone of another brand and there were several brands in this group of respondents. Also the idea was to concentrate on comparing brands that represent the biggest mobile phone Operating Systems (OS) on the market according to market share in 2013: Samsung has an Android OS with 78% market share, Apple has iOS with 17.5% market share and Nokia Lumia has Windows Phone OS with 3% market share (IDC, 2014).

Table 6. Smartphone OS Market Share in 2014 (IDC, 2014)

Period	Android OS	iOS	Windows Phone OS	BlackBerry OS	Others
Q4 2014	76.60%	19.70%	2.80%	0.40%	0.50%
Q4 2013	78.20%	17.50%	3.00%	0.60%	0.80%

The data set consists of the combined responses of 506 respondents to the same questions on three different brands (Nokia, Samsung, Apple) summing up to a combined set of 1518 responses in total. By analyzing the combined responses to all of the three brands, the effect of the brand bias was reduced to a minimum and the result can be considered to represent a more general brand experience. Also separate CFAs were conducted individually for each of the brands, so that the 506 responses for Nokia, 506 responses for Samsung, and 506 responses for Apple were analyzed separately to verify that the brand experiences of the individual brands are also in line with the general brand experience.

3.2.5 Missing Data

All the answers with the option “Do not know” were coded as missing data in the data set. Below Table 7 lists the ratio of missing data for all of the responses. The data consists of the responses for all of the three brands (N= 3x 506=1518). Only one of the questions has a missing value for over 25% of the responses, the negatively worded statement on the behavioral dimension has missing values for 28,3% of the responses. Otherwise, the share of missing values is 11-22% for the rest of the items, the mean being 15.7%.

Table 7. Missing data per item

Item in the measurement model	N Valid	N Missing	% Missing
ThreeBrand_1-a- This brand induces feelings and sentiments.	1341	177	11,7
ThreeBrand_2-I- This brand makes me think about the state of the environment.	1279	239	15,7
ThreeBrand_3-i- This brand stimulates my curiosity and problem solving.	1289	229	15,1
ThreeBrand_4-s- I find this brand interesting in a sensory way. (sight, touch, hearing, taste, and smell).	1299	219	14,4
ThreeBrand_5-a- This brand is an emotional brand.	1331	187	12,3
ThreeBrand_7-i- This brand does not make me think.	1302	216	14,2
ThreeBrand_8-i- I engage in a lot of thinking when I encounter this brand.	1292	226	14,9
ThreeBrand_9-b- This brand is not action oriented.	1089	429	28,3
ThreeBrand_10-s- This brand does not appeal to my senses. (sight, touch, hearing, taste, and smell).	1265	253	16,7
ThreeBrand_11-S- This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	1177	341	22,5
ThreeBrand_12-a- I do not have strong emotions for this brand.	1350	168	11,1
ThreeBrand_13-A- This brand creates eco-friendly emotions.	1230	288	19,0
ThreeBrand_14-s- This brand makes a strong impression on my visual sense or other senses. (sight, touch, hearing, taste, smell).	1286	232	15,3
ThreeBrand_15-b- This brand results in bodily experiences.	1251	267	17,6
ThreeBrand_16-B- This brand makes me behave in an eco-friendly way.	1272	246	16,2
ThreeBrand_17-b- I engage in physical actions and behaviors when I use this brand.	1232	286	18,8

3.3 Methods of Analysis

To verify which measurement model fit the data the best, Structural Equation Modelling (SEM) was done in a similar fashion as was done in the research done by Brakus et al (2009). The main quantitative analysis method was Confirmatory Factor Analysis (CFA), however, also Principal Component Analysis (PCA) was conducted in the initial phase to explore how the items loaded on various factors. The results of the PCA are presented only very briefly for this study, but they indicated that the items do load on similar kind of factors as in the research by Brakus et al. The program used for doing the PCA was IBM SPSS Version 21. The program used for doing Structural Equation

Modelling (SEM) and conducting the CFA was Amos Graphics IBM SPSS Amos 21.0.0, Build 1178.

The PCA method illustrates factors in mathematical terms of best fit and is done in various steps by eliminating factors gradually in the analysis so it is driven by the data more than by a theory. After reducing the number of factors they are usually transformed by rotation. Contrarily, in CFA the factors are defined directly and they should already initially incorporate characteristics that are included in the hypotheses and the CFA is used to test how well the constructs fit the data. (Nunnally and Bernstein, 1994). Testing explicit hypotheses offers many advantages and it is good that CFA compels researchers to consider how the data is organized beforehand which gives the possibility to take into account in the analysis the specific reasons why the variables were chosen (Nunnally and Bernstein, 1994).

The option of "Do not know" in the response options was coded and handled as missing data in the data set. For estimation of discrepancy, Maximum Likelihood was used to estimate means and intercepts. Maximum likelihood uses all of the data and allows Missing At Random (MAR) which depends on features of the observed data (Bentler, 2010). For the purpose of computing fit measures with incomplete data, the data was fit to saturated and independence models by Amos. The software also calculated the standardized estimates, and the analysis was done with random permutations. The method of using maximum likelihood to estimate missing data in the present study used Amos Graphics Full-Information Maximum Likelihood (FIML), and it uses all of the information of the observed data, including mean and variance for the missing portions of a variable, given the observed portions of other variables. Amos is not limited by the number of missing data patterns, and it does not require any complex steps to accommodate missing data (Carter, 2006).

3.4 Measurement Model

The procedure for selecting the items for the measurement model is presented in the section below. The measurement model was confirmed by running both PCA and CFA on the items. The assessment of the reliability of the results is based on the results of the CFA.

3.4.1 Validation of the Measurement Model

The validity of the measurement model was evaluated by CFA. The selection criteria for model fit indices are based on SEM methodology research and literature mainly from consumer psychology. Literature distinguishes two kinds of fit indices: those reflecting absolute fit, and those reflecting incremental fit, which refers to the fit of one model relative to another. Absolute indicators of model fit include, for example, chi square and incremental fit statistics include CFI, among others (Iacobucci, 2010).

CFA was done for three different SEM models to validate the measurement constructs and scales. First, the original four-factor BBX model was used to analyze the data, then the model was extended by adding one environmental item in each of the four factors, finally a construct consisting of the four-factor BBX model with an additional fifth factor for eco-friendliness was tested.

The size of the sample determines the significance of the loadings. If the sample size is over 500, a factor loading will be statistically significant if it is greater than or equal to .30. However, Janssens et al. (2008) state that often in practice the factor loading must be at least .50 before a variable may be assigned to a certain factor, and this rule requires a minimum sample size of 100. When examining convergent validity and composite reliability, the factor loadings should be at least .5 and preferably .7 or higher (Bagozzi and Yi, 2012). Factor loadings below .5 or so indicate variables that are not especially aligned with the factors, however, acceptable reliabilities even below .5 may be appear when the CFA model fits satisfactorily (Bagozzi and Yi, 2012).

Opposite signs of factor loadings for different variables in the case of the same factor reflect that the various variables are related with the same factor but in opposite directions (Janssens *et al.*, 2008). Negative values for factor loadings may occur when fitting non-linear functions to data. The negative statements load negatively which is logical as the statements are totally opposite from the positive statements, and the negative and positive statements cannot be valid at the same time. The absolute value of the loadings for the negative statement is used when analyzing the construct validity.

3.4.2 Evaluation of the Model Fit Indices

Based on some of the general recommendations on selecting absolute fit indices, the following model fit indices are used in this research: chi square, the degrees of freedom and its probability (Markland, 2007). In addition, as in most SEM model researches, the Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA) are also included (Bentler, 2010). The Tucker-Lewis Index (TLI) is also considered to be a reliable index, and therefore it is referred to in this research as well (Janssens *et al.*, 2008). In some SEM literature, the TLI is also called the non-normed fit index (NNFI) and its use is recommended in addition to RMSEA, CFI (Bagozzi and Yi, 2012).

McIntosh (2007) states the chi square test is the most rigorous global test available in SEM for testing distributional and structural assumptions and thus recommends to start a model evaluation with the chi square test, also Bagozzi and Yi (2012) consider the chi square is one of the most important statistical tests for model, but they remind that it is sensitive to the size of the sample. However, the chi square test is also subjective, just as the approximate fit indices are, and there is no golden rule that can be associated with it, instead it should be demonstrated that the data does not depart considerably from the model (Markland, 2007). Due to the fact that models differ by complexity, parameter

values, sample sizes and data distributions, it is hard to provide golden rules for cut-off values (Markland, 2007). Usually, the larger the size of the sample, the more probable it is that the model will fail to fit according to the chi square fit test (Barrett, 2007). (Iacobucci, 2010) notes that one should not be too concerned with the chi square, as it does not in most cases fit if the sample size is 50 or more. In accordance with the recommendation of (Mulaik, 2007), the choice for analyzing the model fit is not done between chi square tests and goodness of fit indices, as they are complementary.

It is also important to note, that method effects, such as positively and negatively worded items, might result in some under-parameterization (Markland, 2007). In the data set used in this research, each of the dimensions in the original BBX includes a negatively worded item on each of the four brand experience dimensions. However, it is suitable in these cases to refer to the residual patterning as proof of model fit and also accept the model even if it has a significant chi square value (Markland, 2007).

TLI and CFI are one of the most reliable indices, and they should preferably be greater than .90 (Janssens *et al.*, 2008). In SEM literature, it has also been noted that CFI gets larger as the model and data become more interesting and moves away from a simplistic model of independence, however, CFI is still a very powerful index, and one should not be too critical if the CFI does not quite reach the recommended value (Iacobucci, 2010).

The selection of the cut-off values for the model fit indices is not straight-forward, and it was not unproblematic in this research either. The optimal cutoff criteria for most model fit indices are conditional upon a variety of factors including the estimation method used, sample size, and model complexity. According to Tomarken and Waller (2005), conventional guidelines for the selection and interpretation of fit indices are often incorrect or oversimplified. Due to the complexity of the issues related to interpreting the fit indices, even in the best of cases some subjectivity is included when assessing model fit. Design factors are just as critical as they impact statistical power, and measures of fit are sensitive to poor designs (Tomarken and Waller, 2005). Fabrigar et al. (2010) warn that often researchers interpret model fit indices in a simplistic and dichotomous way, and that dichotomous cut-off values can be arbitrary.

The criterion used for fit is considered to be an abstract concept in the majority of SEM models (Barrett, 2007). Due to the fact that models differ by complexity, parameter values and sample sizes and data distributions it is hard to provide golden rules for cut-off values (Markland, 2007). Generally, the larger the sample size, the more likely a model will fail to fit via using the chi square goodness of fit test (Barrett, 2007). According to Iacobucci (2010), one should not be too concerned with the chi square, as it does no not in most cases fit if the sample size is 50 or more. Also, one should not be overly critical if the CFI is not quite .95 (Iacobucci, 2010). Iacobucci's guideline is that a model that fits well often results in a chi square value close to N, which indicates that chi square is sensitive to N. The sample size being 1518 in this study would then mean

that the chi square could around 1518 and even higher for a model to fit still well. Also, the chi square increases as a function of degrees of freedom (Iacobucci, 2010), which can also be seen in the results of this study below.

In SEM literature, different cut-off values area presented for RMSEA. According to Janssens et al. (2008), Hu and Bentler (1999) place the cut-off for RMSEA at .06, whereas Browne and Cudeck (1993) consider that values less than or equal to .05 indicate a good fit and values up to .08 indicate an acceptable fit. The sources of Iacobucci (2010) also indicate that RMSEA is not reliable with all samples, and the fit tends to worsen as the number of variables in the model increase. Table 8 below summarizes the recommendations for the cut-off values for the model fit indices used in this study.

Table 8. Indices for Evaluating Model Fit

Model Fit Indices	Range	Recommendation	Description
Chi Square	sensitive to N	a model that fits well would produce a chi square close to N (Iacobucci, 2010)	A measurement indicating how expectations compare to results. The data is random, mutually exclusive, drawn from independent variables and from a large enough sample.
Probability level		0,000	p <0.001
TLI	0 to 1	- greater than 0.90 indicate acceptable fit (Tomarken and Waller, 2005)	Tucker-Lewis Index is an incremental fit index
CFI	0.0 to 1.0	- close to 0.95 (Iacobucci, 2010) -greater than 0.90 indicate acceptable fit (Tomarken and Waller, 2005) - greater than .80 permissible	Comparative Fit Index is an incremental fit index. It takes the fit of one model to the data and compares it to the fit of another model to the same data (Bentler , 2010, Iacobucci, 2010).
RMSEA	0 to 1	< .05 good fit < .08 acceptable fit < .10 moderate fit	Root Mean Square Error of Approximation.

4 RESULTS

This chapter concentrates on reporting the findings and presenting the empirical data by starting with the details on the respondents of the survey and then analyzing how well the research questions can be answered and are supported by the data.

4.1 Principal Component Analysis (PCA)

Exploratory factor analysis (EFA) was done with the PCA method and it revealed several factors that were in line with the factors that showed up in the analysis of Brakus et al (2009). However, there were some small differences in the way the factors loaded for the individual brands, so it was decided that the responses for the three biggest brands would be combined to get a result without a brand bias. When PCA was conducted for the combined responses for the three brands, the result was that all the items relating to eco-friendliness load principally on the first component or factor. The first factor is the one where also nearly all of the positive behavioral, sensory and intellectual statements load the strongest. All the negative statements for all of the dimensions load negatively on the first factor and positively on either factor 2 or both factors 2 and 3.

For all of the dimensions, one factor mainly explained the most of the data variation, and none of the other items had a loading of zero or less on the first dimension, so the development of the scale development proceeded with the presumption that there would be a simple linear combination of the individual items and that no individual item is sufficient on its own, but that the entire scale is required to measure the construct of brand experience (Nunnally and Bernstein, 1994). See Table 9 for the detailed results of the PCA for the combined responses for the three brands. The table shows the unrotated loadings of each item. SPSS uses the Kaiser criterion and retains all of the components with the Eigen value of over 1.

Table 9. PCA on the combined responses for the three brands

	Component		
	1	2	3
ThreeBrand_3-i- This brand stimulates my curiosity and problem solving.	.843		
ThreeBrand_16-B- This brand makes me behave in an eco-friendly way.	.824	.321	
ThreeBrand_15-b- This brand results in bodily experiences.	.816		
ThreeBrand_4-s- I find this brand interesting in a sensory way. (sight, touch, hearing, taste, and smell).	.814		
ThreeBrand_14-s- This brand makes a strong impression on my visual sense or other senses. (sight, touch, hearing, taste, and smell).	.808		
ThreeBrand_13-A- This brand creates eco-friendly emotions.	.807	.375	
ThreeBrand_17-b- I engage in physical actions and behaviors when I use this brand.	.779		
ThreeBrand_2-I- This brand makes me think about the state of the environment.	.769		
ThreeBrand_11-S- This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	.719	.433	
ThreeBrand_5-a- This brand is an emotional brand.	.701	-.334	.335
ThreeBrand_8-i- I engage in a lot of thinking when I encounter this brand.	.649		
ThreeBrand_1-a- This brand induces feelings and sentiments.	.566	-.405	.440
ThreeBrand_7-i- This brand does not make me think.	-.392	.585	
ThreeBrand_12-a- I do not have strong emotions for this brand.	-.404	.563	
ThreeBrand_9-b- This brand is not action oriented.	-.305	.381	.682
ThreeBrand_10-s- This brand does not appeal to my senses. (sight, touch, hearing, taste, and smell).	-.469	.440	.567

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As the results for the PCA indicated that the items of eco-friendliness loaded principally on the first factor as the majority of the other items, it was worthwhile moving to the next phase in the study, and test what the results for the eco-friendliness items would be when analyzing the models with CFA.

In this study, the number of scale items in the original 12-item BBX were increased by four items on eco-friendliness. The stability of the scale was already originally tested by Brakus et al. (2009), first by using students and then by a sample from the wider population and the 12 scale items in the original BBX model was then proven to be brand and respondent independent and it demonstrated the general brand experience of the respondents. As original the BBX model had already undergone such a thorough analysis with the various model options to find the four-factor model and it had been verified for model fit with structural equation modelling and confirmatory factor analysis, in this study it was taken as the starting point for testing how the results could be replicated with a different data set.

In the actual survey there were 5 mobile phone brands included that the respondents were asked to respond to, however, only the responses for three of the major brands were analyzed for this study: Samsung, Nokia Lumia and Apple. The reason why the responses for the Sony and hTc brands were not included in the analyses is that the brands were not that familiar to the respondents and the number of 'Do not know' response options were high for these two brands. The sample includes responses from 506 respondents on three brands evaluating the extent to which the 16 items of the scale describe their experience with each brand using an eight-point Likert scale where all the response options are anchored.

The positioning of the environmental dimension in the BBX scale was tested with four items on eco-friendliness, one designed for each of the four brand experience dimensions used in the BBX model: affective, sensory, behavioral, intellectual. In the following section, the conceptual models are analyzed individually and then compared to each other to identify the option that has the best explanatory power. In the conceptual modelling, the original BBX model has been used as a basis for measuring the brand experience, but for the second and third research question it has also been extended with a set of items on how an environmental aspect is considered to be included in the brand experience. The four-factor BBX model was first analyzed without including the items on eco-friendliness. Then the four-factor model was tested with an eco-friendliness item added in each of the four factors. And lastly, the five-factor model with a separate factor for the eco-friendliness items was tested. In the analysis of all of the three models, the same data set was used. The major part of the research analysis has to do with the testing of the three different BBX model constructs that are the focus of this study. Below the results for the model fit of each of the models will be described and discussed in detail as well as the factor loadings and results from the CFA done on the basis of the SEM.

4.2 The Four-Factor BBX Model (Model 1)

The presumption was that the data would fit this model, because also the original BBX model had been tested with the same brands that were used in this research, i.e. Nokia, Samsung and Apple. The CFA confirmed that the four-factor model with correlated factors also fit the data set of this research. In the research of Brakus et al. (2009) the CFA for the four-factor model with correlated factors resulted in the best fit indices. The fit was considered to be a reasonable fit as the results for the fit indices were the following: the goodness-of-fit index (GFI) = .92, the comparative fit index (CFI) = .91, and the root mean square error of approximation (RMSEA) = .08, all indicating acceptable fit, and chi square (48) = 278.61, $p < .001$ (Brakus et al., 2009).

In the case of Model 1 with the original brand experience dimensions, the fit indices referred to in this study for the combined data for the three brands were the following: CFI = .888, TLI = .818 and RMSEA = .115, all indicating acceptable fit, and chi square (48) = 1006.01, $p < .000$. The absolute fit index chi-square, indicates that the data fits the original BBX model. The N for the three brands is 1518, and for the individual brands 506. However, the value of RMSEA does not suggest a very good fit, but based on the other incremental indices, TLI and CFI, the model provided a reasonable fit to permit further analysis along these lines and gave sufficient evidence that the model is applicable also in the case of high-technology products. When comparing the results to those from the original study Brakus and his colleagues the results are in line; in the original four-factor BBX model the chi-square value is 278.61 which is also over N (respondents consisted of 193 students).

The three brands were also analyzed individually. When examining closer at the model fit indices for the brands individually, one can see that the CFI is slightly higher for Samsung at .903, and lower for Nokia and Apple at .872, also the TLI is higher for Samsung at .843 and lower for Nokia and Apple at .79. The chi square is along the same lines slightly better for Samsung at 373.57 than for Nokia and Apple that have a slightly higher chi square value. All of the chi square values are very good as they are below the N which is 506 for the individual brands. The RMSEA values for the individual brands, ranging from .116 to .118, are very close to combined value for the three brands .115, and none of these values are considered to be fully satisfactory. All in all, the fit indices for Samsung are even better than the combined responses for the three brands, which is an indication that the data fits the original BBX model very well in the case of Samsung. Table 10 below includes the model fit indices for Model 1 for the combined responses for the three brands as well as for the individual brands.

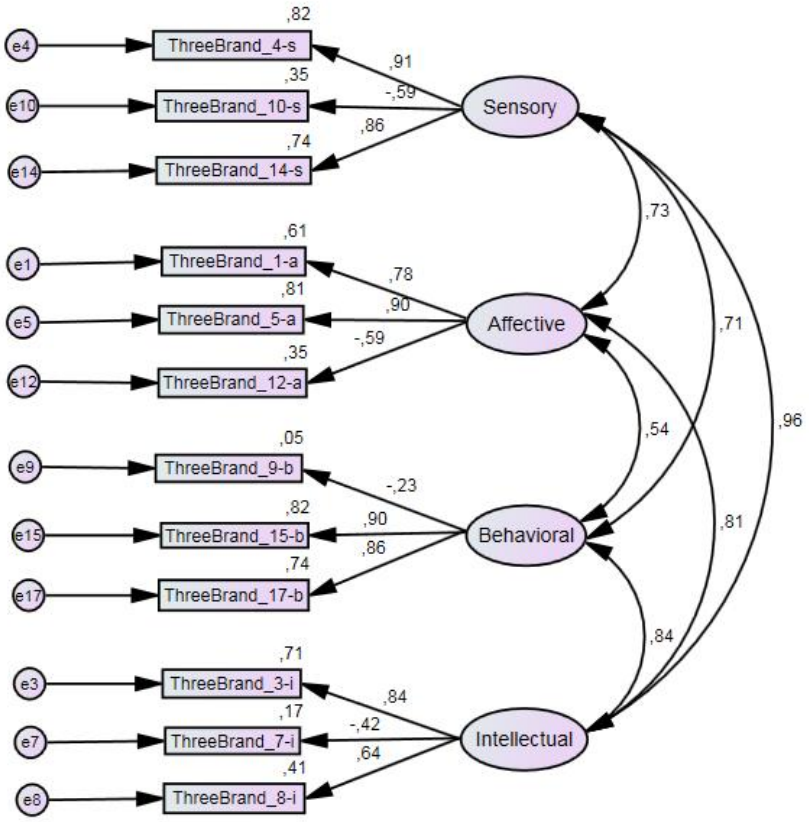
Table 10. Model fit indices for Model 1

Model Fit Indices	1) Original BBX Model			
Brands	**3 Brands**	**Samsung**	**Nokia**	**Apple**
Chi square	1006.01	373.57	383.43	382.41
Degrees of freedom	48	48	48	48
Probability level	.000	.000	.000	.000
TLI	.818	.843	.792	.791
CFI	.888	.903	.872	.872
RMSEA	.115	.116	.118	.117

In Figure 2 below, the standardized regression weights or factor loadings for Model 1 with the combined responses for the three brands are presented on the arrows leading to the scale items. High factor loadings are the best indicators of a common factor (Janssens *et al.,* 2008), and in this case all of the factor loadings are very high for the positive statements. The sensory, affective and behavioral dimensions all have very high factor loadings for the positive items. Only one of the intellectual positive items ("ThreeBrand_8-i- I engage in a lot of thinking when I encounter this brand") has a slightly smaller factor loading .64 than rest of the factors.

The negatively worded items have negative factor loadings ("7-i- This brand does not make me think", "9-b- This brand is not action oriented", "10-s- This brand does not appeal to my senses", "12-a- I do not have strong emotions for this brand"). This is logical again when you think of the opposite meanings of the negative and positive statements, a brand cannot understandably create opposite experiences at the same time on the same dimension. The sensory and affective negative items have fairly high negative factor loadings (-.59). The loading for the negative behavioral statement (-.23) is the lowest ("ThreeBrand_9-b- This brand is not action oriented").

Figure 2. CFA of Model 1 for combined responses on 3 brands



The standardized estimates of the squared multiple correlations (R squares) for the endogenous variables (values above the measurement item boxes in the model presented in Figure 2) are used to calculate the composite reliabilities, or construct reliabilities per item (Janssens *et al.*, 2008). The composite reliability metrics has been presented in more detail for each of the three tested models in Chapter 5.5. Reliability and Validity.

The values beside the two-way arrows in Figure 2 indicate the estimates of correlations between the exogenous variables. The value for the correlation of two variables shows how strongly these two factors vary in accordance with each other. The correlations between the four exogenous variables need to be checked for collinearity, and possible problems, especially in cases where the correlations are greater than .8 or .9. However for a larger sample a correlation of .85 may not even be a problem, one needs to always consider the target of the analysis to evaluate is multi-collinearity really a problem or not (Berry and Feldman, 1985).

When comparing the correlations in Model 1 with the ones in the original BBX model of Brakus et al. (2009) in Table 11 below, the major difference is the higher correlation

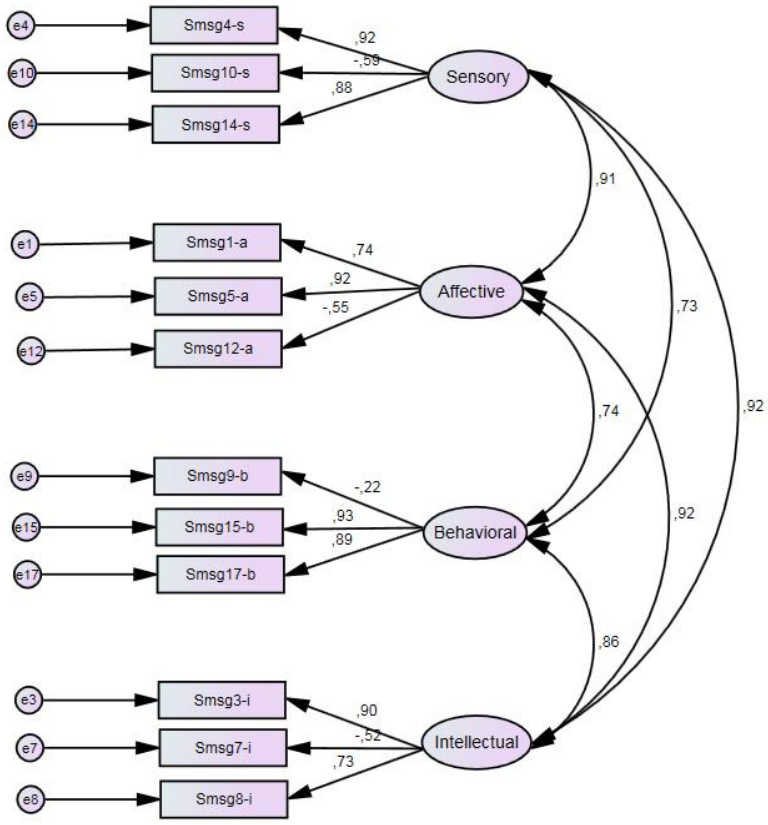
between the Intellectual and Sensory variables in Model 1 of this study compared to the original BBX model. Also, the correlation is higher between the Intellectual and Behavioral variables, but this is not as alarming as the value is still below .9. However, the value for the correlation between the Intellectual and Sensory being .96 would need to be examined more closely within another study, as it is nearly the same for Model 2 (.92) and Model 3 (.95) in this study. In this case, this is not considered to be an issue, as the values for the original BBX model of Brakus et al. (2009) are good, and as this is a replication research, more data would need to be analyzed to question the factors in the model.

Table 11. Correlations among exogenous variables in Model 1 and in the original BBX model

	Model 1	Original BBX model
Affective <--> Sensory	.73	.81
Affective <--> Behavioral	.54	.59
Intellectual <--> Behavioral	.84	.57
Affective <--> Intellectual	.81	.80
Intellectual <--> Sensory	.96	.69
Behavioral <--> Sensory	.71	.70

Below is the CFA of Model 1 for Samsung based on an analysis of a data set of 506 responses (Figure 3). Compared to the overall factor loadings for the combined data set of the three brands, for Samsung there are minimally higher factor loadings for the positive items for the sensory dimension. However, for the affective dimension the factor loadings are slightly lower for items 1-a (This brand induces feelings and sentiments) and 12-a (I do not have strong emotions for this brand), while for 5-a (This brand is an emotional brand) they are minimally higher. In the case of the behavioral dimension, the factor loadings are slightly higher for Samsung than the combined score for the three brands, for both of the positive items, and minimally smaller or nearly the same for the negative item. For all of the intellectual items, both positive and negative ones, Samsung has slightly higher factor loadings than the combined three brands.

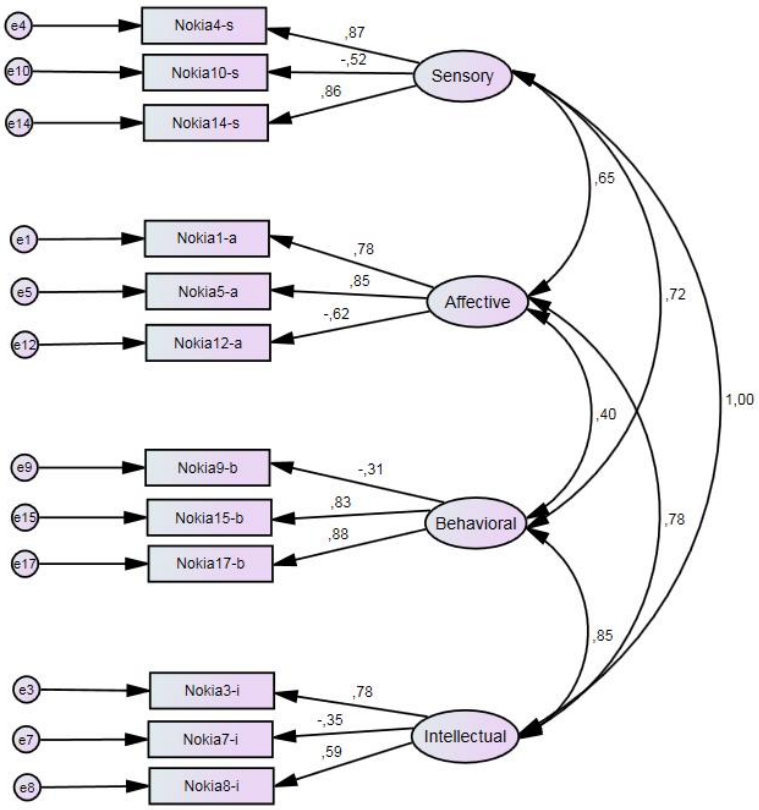
Figure 3. CFA of Model 1 for Samsung



When comparing the factor loadings in the CFA of Model 1 for Nokia (data set of 506 responses) presented in Figure 4 with the CFA of Model 1 for the combined responses (Figure 2), one can see that the factor loadings for the Sensory dimension, the 14-s (This brand is an emotional brand) is the same, however, for 4-s (I find this brand interesting in a sensory way) the factor loading is slightly lower, as well as for the negative item. For the affective dimension, the factor loading for 5-a (This brand is an emotional brand) is lower for Nokia than the 3brands, and it is the same as in the case of the combined responses for the 1-a (This brand induces feelings and sentiments), the negative statement is slightly higher than for the 3brands. In the behavioral dimension, Nokia has scored minimally higher for the factor loading of 17-b (I engage in physical actions and behaviors when I use this brand), and slightly higher for the negative item, but slightly lower for the 15-b item (This brand results in bodily experiences). With the intellectual items, Nokia has scored a slightly lower score for all of the items, both the positive ones as well as the negative one.

One noteworthy issue with this model in the case of the data on Nokia, is that for this model the covariance matrix is not positive definite. In this specific model some of the variance estimates are negative, or some exogenous variables have an estimated covariance matrix that is not positive definite. According to the Amos program analysis, it is due to either the reason that this specific model is somehow wrongly defined or that the sample is too small. However, Amos does not allow to restrict the search for a solution to admissible parameter values, which could possibly prevent the occurrence of negative variance estimates, which could help to prevent the occurrence of inadmissible solutions in general. However, for the overall result of this study this one occurrence of a problem with the covariance does not have a significant impact and it does not diminish the value of the findings of this study.

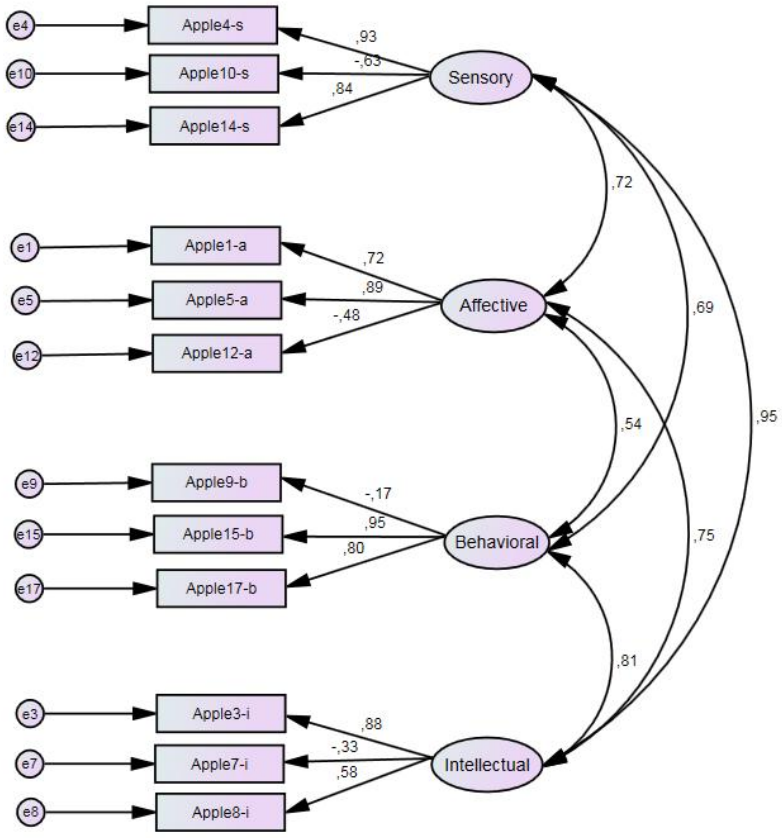
Figure 4. CFA of Model 1 for Nokia



In the case of the factor loadings in the CFA of Model 1 for Apple (data set of 506 responses), one can see that for the sensory dimension, the 14-s item (This brand makes a strong impression on my visual sense or other senses) loads minimally less than in the case of the CFA of the combined responses, and the 4-s item (I find this brand interesting in a sensory way) in turn has a minimally higher loading, and also for the negative item the loadings are slightly higher than for the three brands combined (Figure 5). With the affective dimension, all of the factor loadings are lower for Apple,

5-a (This brand is an emotional brand) only minimally lower, but for 1-a (This brand induces feelings and sentiments) the loading is slightly lower, while for the negative item clearly lower by .11. For the behavioral dimension, the factor loadings are clearly higher for 15-b (This brand results in bodily experiences), but then slightly lower for 17-b (I engage in physical actions and behaviors when I use this brand) as well as for the negative item. In the case of the intellectual dimension, the loadings for the Apple brand are lower for 8-i (I engage in a lot of thinking when I encounter this brand), and for the negative item, however, for the 3-i item (This brand stimulates my curiosity and problem solving) the factor loadings are slightly higher for the Apple brand. With this model minimum was achieved, which means that Amos reached a local minimum.

Figure 5. CFA of Model 1 for Apple



The correlations between the four exogenous variables in the Model 1 were also checked per brand for collinearity, to see if there are correlations that are greater than 0.8 or 0.9 (See Table 12). Just as for the Model 1 with the combined responses the three brands, also in the case of the individual brands, for Model 1 the high correlation between the intellectual and sensory factors suggests that there would be a need to examine further in future studies if these factors are to be combined somehow for the basic BBX model. The collinearity can be seen in the correlations for all of the brands and especially in the case of the Nokia brand, which seems to be an indication of a lack

of discrimination between the constructs. However, as the correlation is not so high in the original study of Brakus et al. (2009) where it is only .69 as can be seen in Table 11, this specific non-conformity does not cause any specific problems in this study to the overall solution.

Table 12. Correlations between the exogenous variables for Model 1 for the combined data on the three brands, and each of the brands individually

Model 1			3 brands	Samsung	Nokia	Apple
Affective	<-->	Sensory	.73	.91	.65	.72
Affective	<-->	Behavioral	.54	.74	.40	.54
Intellectual	<-->	Behavioral	.84	.86	.85	.81
Affective	<-->	Intellectual	.81	.92	.78	.75
Intellectual	<-->	Sensory	.96	.92	1.00	.95
Behavioral	<-->	Sensory	.71	.73	.72	.69

4.3 Four-Factor Model Including Items on Eco-Friendliness (Model 2)

For the second model, the additional items on eco-friendliness were embedded in the four factors of the original BBX model. The research question in the case of this model was to study whether eco-friendliness is included in the four brand experience dimensions of the original BBX model. From the three models analyzed in this study, the model fit indices were the least satisfactory for this second model. The fit measures for Model 2 proved to be a worse fit than for the original BBX model in the case of the three high-tech brands analyzed in this study.

The fit indices were: CFI = .770, TLI = .681 and RMSEA = .144, and chi square (98) = 3188.28, $p < .000$. The chi-square at 3188 is clearly above the recommendations, even though with the degrees of freedom are higher for this model than for the first model, the value is not satisfactory. The TLI and CFI values being clearly below the recommend cut-off values at 0.9 also indicate that the data does not fit this model. Also the the RMSEA is above the acceptable cut-off value.

In the case of Model 2, also for the individual brands the fit indices are not acceptable. Even though the CFI is slightly higher again for Samsung at .770, it is not acceptable, it is even lower for Nokia and Apple at .74. Also the TLI is higher for Samsung at .748 and lower for Nokia and Apple at .65 and .64 respectively. The chi square is slightly better for Samsung at 1023.43 than for Nokia and Apple that have a chi square value of 1176.91 and 1167.41. All of the chi square values are way above the limits of being acceptable as they are over double the N which is 506 for the individual brands. The

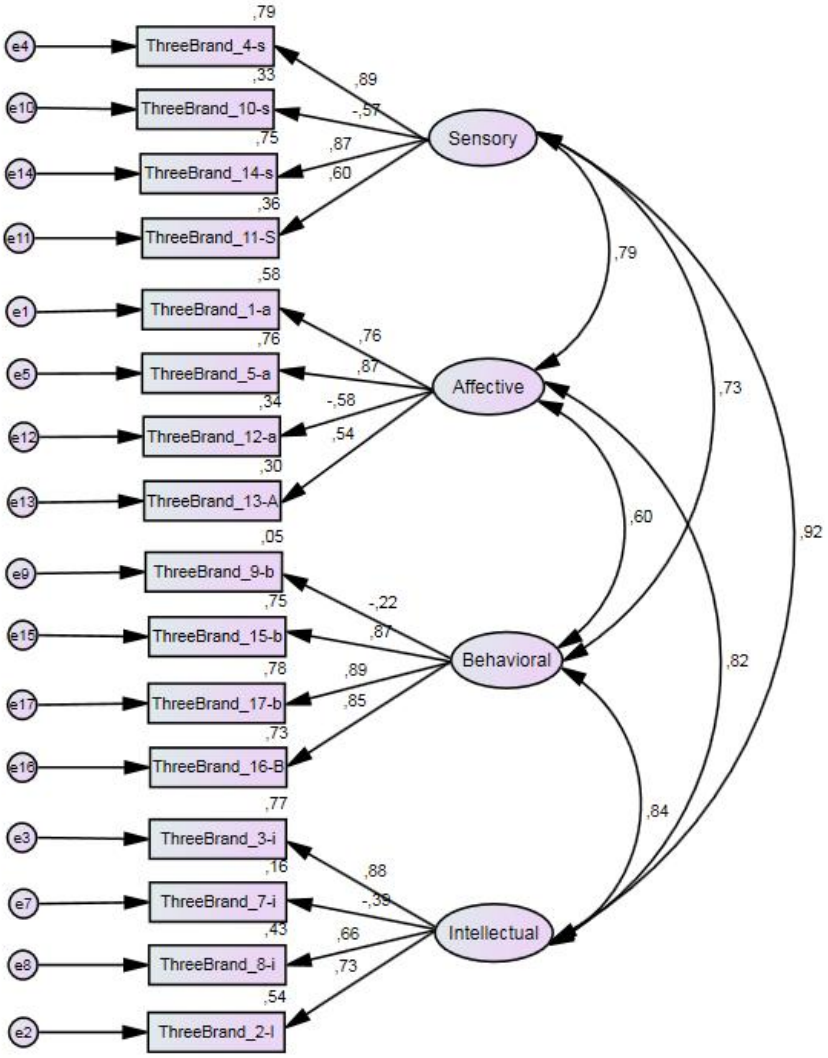
RMSEA values for the individual brands are way above the recommended cut-off value ranging from .137 for Samsung to .147 and .148 with Nokia and Samsung. To summarize, the fit indices for all of the individual brands are not acceptable as can be seen in Table 13.

Table 13. Model fit indices for Model 2

Model Fit Indices	**2) Eco-friendliness embedded**			
Brands	**3 Brands**	**Samsung**	**Nokia**	**Apple**
Chi square	3188.28	1023.43	1176.91	1167.41
Degrees of freedom	98	98	98	98
Probability level	.000	.000	.000	.000
TLI	.681	.748	.650	.639
CFI	.770	.818	.747	.740
RMSEA	.144	.137	.148	.147

As can be seen in Figure 6 below, when the items on eco-friendliness are embedded in the four-factor model, they do not have as high loadings for the affective (.54) and sensory (.60) dimensions, as for the behavioral (.85) and intellectual (.73) dimensions. This difference in the loadings per dimension could be perhaps interpreted for high-tech products so that environmental aspects are considered more on the behavioral and intellectual dimensions. In the behavioral dimension the positive items and items on eco-friendliness have nearly the same loading ranging from .85 to .89. In the case of the intellectual dimension, the item on eco-friendliness has a slightly higher factor loading than one of the positive items (ThreeBrand_8-i- I engage in a lot of thinking when I encounter this brand). The factor loadings for the sensory dimension are rather high for the original positive statements and for the affective positive statements as well. There is no significant difference in the negative loadings for the negatively worded statements when compared to the first model.

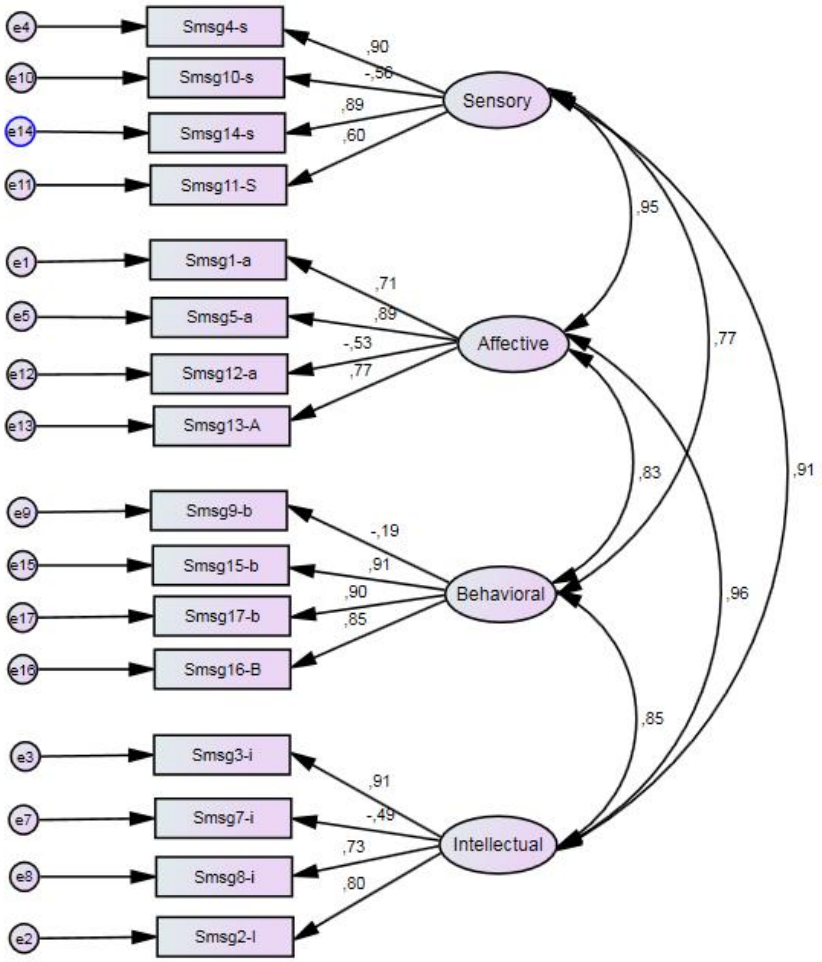
Figure 6. CFA of Model 2 for combined responses on 3 brands



When comparing the CFA of Model 2 for Samsung (data set of 506 responses) with the CFA of Model 2 of the combined responses for the three brands, on the sensory dimension the factor loadings are basically the same as the loadings for the three brands, so that for the positive items the loadings are minimally higher in the case of Samsung (Figure 7). The loading for the sensory eco-friendliness item is exactly the same as for the combined three brands. In the case of the affective dimension, the factor loadings for 1-a (This brand induces feelings and sentiments) and the negative item are slightly lower for Samsung, and for the 5-a (This brand is an emotional brand) the loading is minimally higher. For the affective negative item the loading is slightly lower for Samsung. For the new affective eco-friendliness item, the factor loading for Samsung is clearly higher. (.77 >.54). For the behavioral dimension, in the case of Samsung the factor loadings for the positive items are minimally higher, and the negative items is minimally lower, and the loading for the behavioral eco-friendliness item is exactly the same as for the combined three brands. And for the intellectual dimension, for all of the

items the factor loadings are slightly higher, and for the intellectual eco-friendliness item the loading is slightly higher (.80>.73).

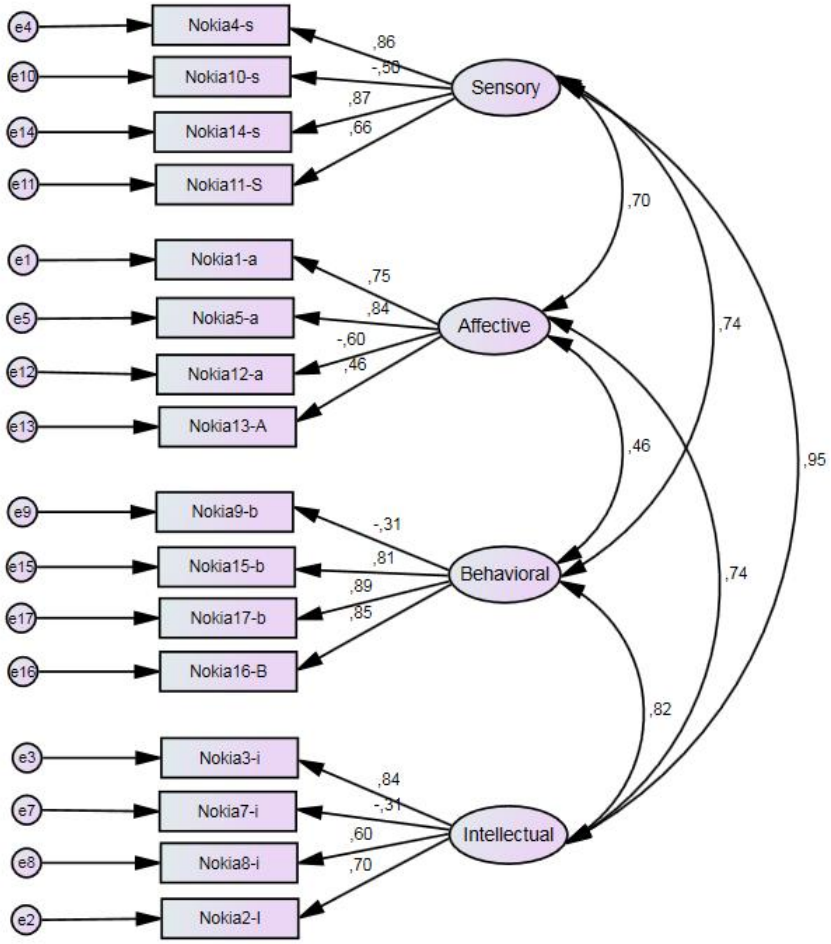
Figure 7. CFA of Model 2 for Samsung



When comparing the results of the CFA of Model 2 for Nokia (data set of 506 responses) with the CFA of Model 2 for the combined responses of the three brands, for the sensory dimension, the loading for the 14-s item (This brand makes a strong impression on my visual sense or other senses) is the exactly same for Nokia and the three brands, and for the 4-s (I find this brand interesting in a sensory way) the loading is slightly lower as well as for the sensory negative item the factor loading is slightly lower than for the combined three brands (Figure 8). The sensory eco-friendly item is slightly higher for the Nokia brand than for the combined responses of the three brands. In the case of the affective dimension, all the factor loadings for the positive items are minimally lower, while for the negative item the loading is minimally higher. The affective eco-friendly item is slightly lower than for the combined three brands (.46<.54). And for the behavioral, for the 17-b item (I engage in physical actions and behaviors when I use this brand) the factor loading is exactly the same, while for 15-b

(This brand results in bodily experiences) it is slightly lower, while for the behavioral negative item it is slightly higher in the case of the Nokia brand compared to the three brands. The loading on the behavioral eco-friendly item is the same as in the case of the combined three brands. For the intellectual dimension, the factor loadings for all of the items are slightly lower than in the case of the combined three brands. Also the loading on the intellectual ecofriendly item is slightly lower for Nokia than for the three combined brands.

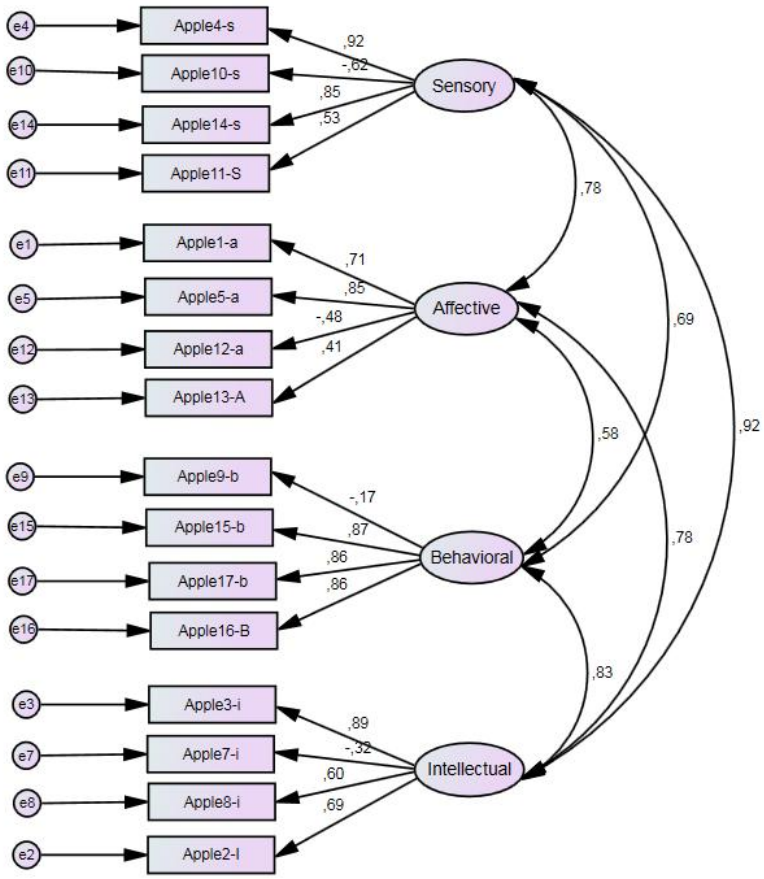
Figure 8. CFA of Model 2 for Nokia



In the CFA of Model 2 for Apple (data set of 506 responses) when comparing with the CFA of Model 2 for the combined responses for the three brands, for the sensory dimension, the loading is minimally lower for the 14-s item (This brand makes a strong impression on my visual sense or other senses), however, they are minimally higher for the 4-s (I find this brand interesting in a sensory way) and the negative item. The sensory eco-friendliness item is slightly lower for the Apple brand (.53<.60) (See Figure 9). In the case of the affective dimension, the loadings for the positive items are slightly lower for Apple than the combined three brands, and also for the negative item. The

affective eco-friendliness item is lower for Apple than for the combined three brands (.41 <.54). And for the behavioral dimension, the 17-b item (I engage in physical actions and behaviors when I use this brand) is slightly smaller, while for the other positive item the loading is exactly the same. Also for the negative behavioral item the loading is slightly smaller. The behavioral eco-friendliness item is nearly the same for Apple as for the combined three brands. Finally, for the intellectual dimension, the loading for 8-i (I engage in a lot of thinking when I encounter this brand) is slightly lower, as is the loading also for the negative item, however, for 3-i (This brand stimulates my curiosity and problem solving) the loading is nearly the same. The loading for the intellectual eco-friendliness is slightly lower (.69<.73).

Figure 9. CFA of Model 2 for Apple



The correlations between the four exogenous variables in the Model 2 were also checked per brand for collinearity and compared to the correlations for the combined three brands, to see if there are correlations that are greater than 0.8 or 0.9 (See Table 14). Also, in the case of the individual brands as well as for the three brands, in Model 2 there is a fairly high correlation between the intellectual and sensory factors which suggests that there may be a lack of discrimination between these constructs. Just as it was in Model 1, it is again in the case of the Nokia brand, where the correlation is the highest between the intellectual and sensory factors. Also for the Samsung brand, there

are fairly high correlations between the affective and sensory variables, as well as the affective and intellectual variables.

Table 14. Correlations between the exogenous variables for Model 2 for the combined data on the three brands and each of the brands individually

Model 2	3 brands	Samsung	Nokia	Apple
Affective <--> Sensory	.79	.95	.70	.78
Affective <--> Behavioral	.60	.83	.46	.58
Intellectual <--> Behavioral	.84	.85	.82	.83
Affective <--> Intellectual	.82	.96	.74	.78
Intellectual <--> Sensory	.92	.91	.95	.92
Behavioral <--> Sensory	.73	.77	.74	.69

4.4 Five-Factor Model with Eco-Friendliness as a Separate Factor (Model 3)

With the third model, the target was to analyze whether there could actually be an additional dimension of eco-friendliness included in the model. In Model 3 where there is a fifth factor including the items on eco-friendliness, the fit indices are the best of the three models analyzed in this study: CFI = .883, TLI = .830 and RMSEA = .105, all indicating acceptable fit, and chi square (94) = 1674.17, $p < .000$.

The incremental fit statistics, RMSEA at .105 is satisfactory and it is the smallest of all the three models, TLI at .830 is the highest, and CFI at .883 nearly same as for the first model. The absolute fit index, chi square is at 1674.16 which is satisfactory, as the chi square can be close to N (1518). The degrees of freedom for the third model is 94 and the *p* value is .000. The chi square increases as a function of degrees of freedom (Iacobucci, 2010) and in this model the degrees of freedom are nearly twice as high as in the first model. Especially the RMSEA for this model indicated the highest improvement over any of the competing models, and also the TLI is highest for this model. CFI is very close to the original four-factor model.

The model fit indices in the case of Model 3 for the brands individually prove to be the best of the three models (Table 15). The CFI is again highest for Samsung at .894, compared to Nokia and Apple at .870 and .868, also the TLI is highest for Samsung at .846 and lower for Nokia and Apple at .811 and .808. The chi square is slightly better for Samsung at 635.32 and Apple at 637.86 than for Nokia at 651.32. All of the chi square values are acceptable as they are still fairly close to N which is 506 for the individual brands. The RMSEA values for the individual brands are the best in the case

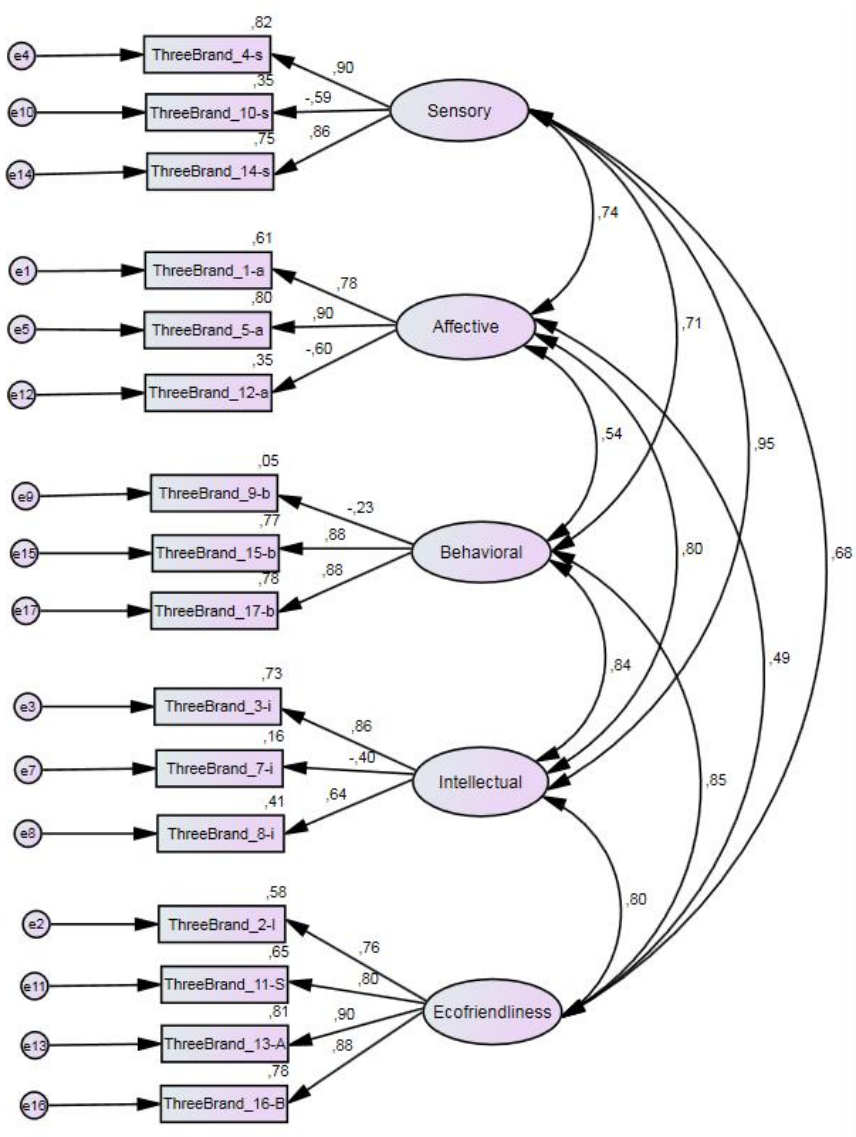
of the third model, ranging from .107 to .108, and the combined value is at .105 which is the highest for all the models. This is the distinctive difference in the results between the three models. The fit indices for Samsung are again slightly better than for the combined responses for the three brands. When one looks at all the model fit indices, this model is also on the individual brand level the one where the data fits the best.

Table 15. Model fit indices for Model 3

Model Fit Indices	**3) Eco-friendliness dimension**			
Brands	**3 Brands**	**Samsung**	**Nokia**	**Apple**
Chi square	1674.17	635.32	651.32	637.86
Degrees of freedom	94	94	94	94
Probability level	.000	.000	.000	.000
TLI	.830	.846	.811	.808
CFI	.883	.894	.870	.868
RMSEA	.105	.107	.108	.107

Figure 10 below shows that the factor loadings are also good for the positive items of Model 3 for the combined responses of the three brands. When comparing the magnitudes of factor loadings of the environmental statements with the ones in model 2 and model 3, one can see that the sensory environmental item loads with a greater magnitude of .20 than in model 2, and the affective environmental item loads even with a greater magnitude of .36 than in model 2. Also the behavioral and intellectual environmental items have slightly higher loadings when they are included in the separate environmental dimension in model 3. This is a clear indication that the environmental dimension is truly a dimension of its own in the BBX scale. The result of the CFA analysis is presented in the Figure 10 below.

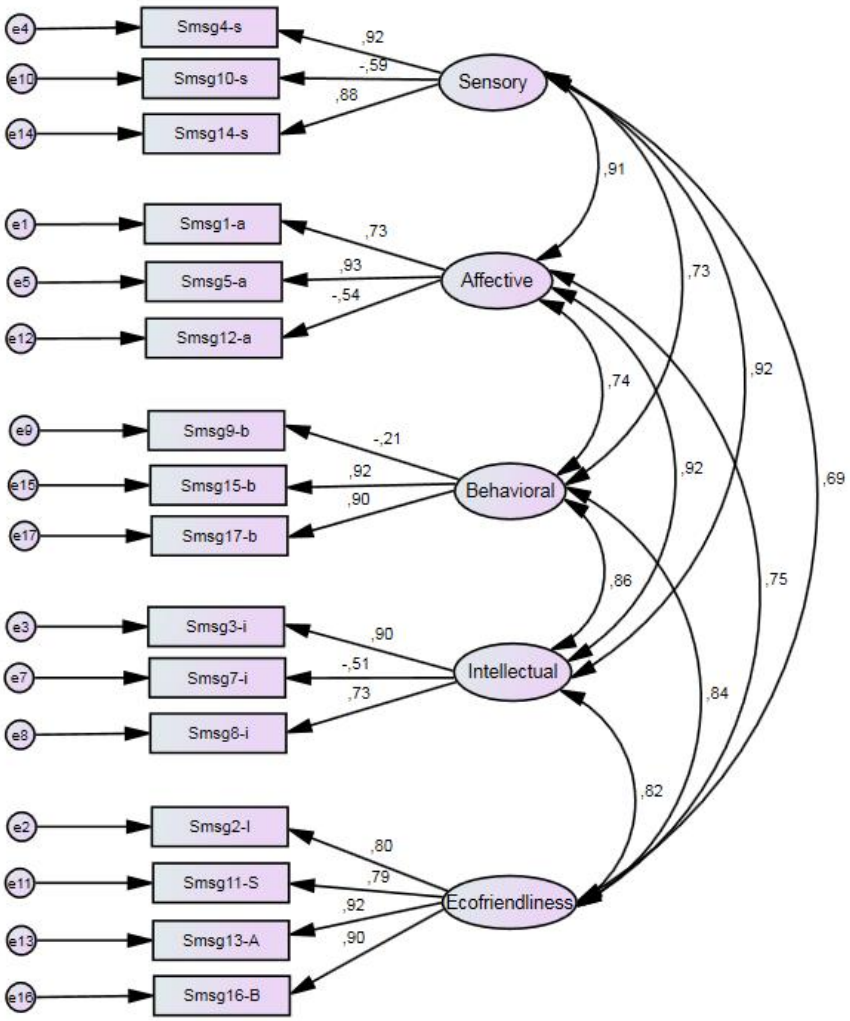
Figure 10. CFA of Model 3 for combined responses on 3 brands



In comparison with the CFA of Model 3 for the three brands, the CFA of Model 3 for Samsung (data set of 506 responses) has for the sensory dimension the loadings for the positive items minimally higher, while the loading for the negative items is exactly the same (Figure 11). In the case of the affective dimension, the loading for 1-a (This brand induces feelings and sentiments) is slightly lower, as it also is for the negative item. For the 5-a item (This brand is an emotional brand) the loading is minimally higher for Samsung. For the behavioral dimension, the loadings for the positive items are minimally higher for Samsung, however, for the negative item the loading is minimally lower in the case of Samsung. When examining the intellectual dimension, for the positive items the loadings are slightly higher for Samsung, and also for the negative item the score for the loading is higher for Samsung than the three brands (-.51>-.40). And finally for the dimension of eco-friendliness, the loadings for three of the eco-

friendliness items are minimally higher (intellectual, affective, behavioral), while for the sensory eco-friendliness item it is minimally lower, or nearly the same as for the three brands combined (.79<.80).

Figure 11. CFA of Model 3 for Samsung

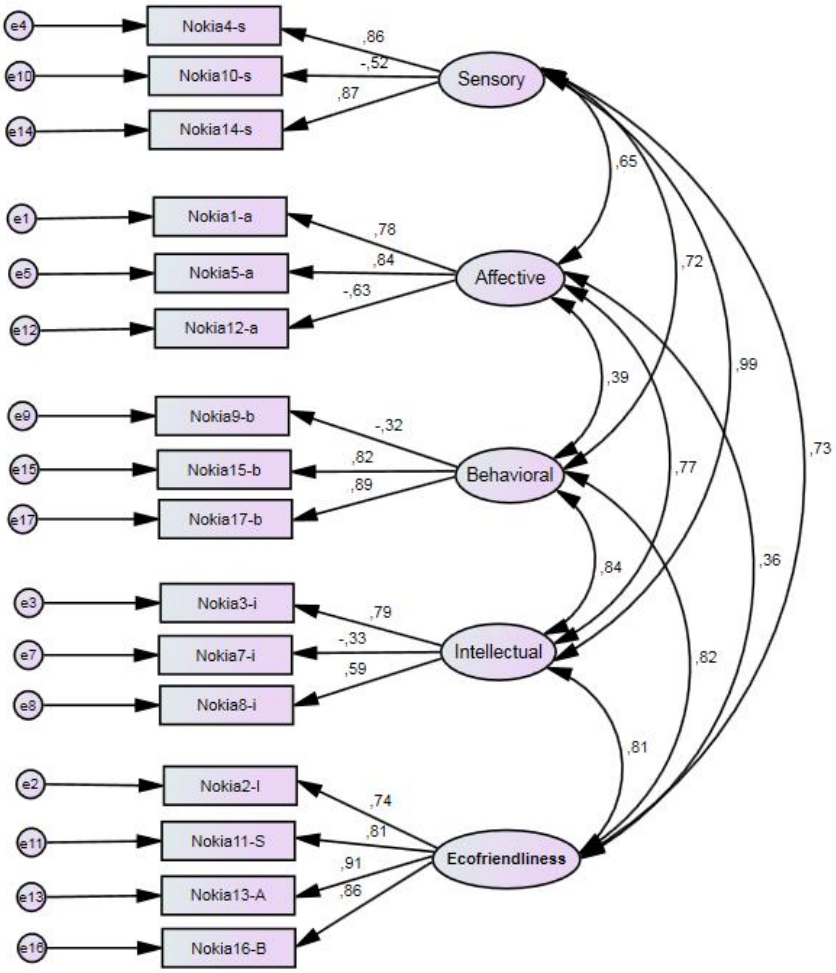


When comparing the CFA of Model 3 for Nokia in Figure 12 (data set of 506 responses) with the CFA of Model 3 of the combined three brands, in the case of the sensory dimension, the loading for the 14-s item (This brand makes a strong impression on my visual sense or other senses) is minimally higher, while the loading for 4-s (I find this brand interesting in a sensory way) is slightly lower, also the loading for the negative item is slight lower in the case of the Nokia brand than the combined three brands. With the affective dimension, the loading for 1-a (This brand induces feelings and sentiments) is exactly the same, while for the 5-a (This brand is an emotional brand) the loading is slightly lower, for the negative item the loading is slightly higher. For the

behavioral dimension, the loading for 17-b (I engage in physical actions and behaviors when I use this brand) is nearly the same, while for 15-b (This brand results in bodily experiences) the loading is slightly lower, and for the negative item it is slightly higher for the Nokia brand. In the case of the intellectual dimension, the loadings for the positive items are slightly lower in the case of Nokia, as well as for the negative item. And finally, for the eco-friendliness dimension, the intellectual and behavioral eco-friendliness items are minimally lower for Nokia compared to the three brands, however, for the sensory and affective items Nokia's loadings are minimally higher or nearly the same.

It should be noted again, as was the situation with the Model 1 in the case of Nokia, the covariance matrix is not positive definite. Amos can produce estimates of variances and covariances that yield covariance matrices that are not positive definite and these solutions are considered to be even inadmissible, however it may be that this model is only near its boundary, as Amos does not attempt to distinguish between a solution that is outside the admissible region and one that is on or near its boundary. As the model is usable for the other brands and the combined responses of the brands, this instance of the covariance not being positive definite is not considered to be a critical issue for the overall result of this study, it is only a slight deviance in the results of the analysis.

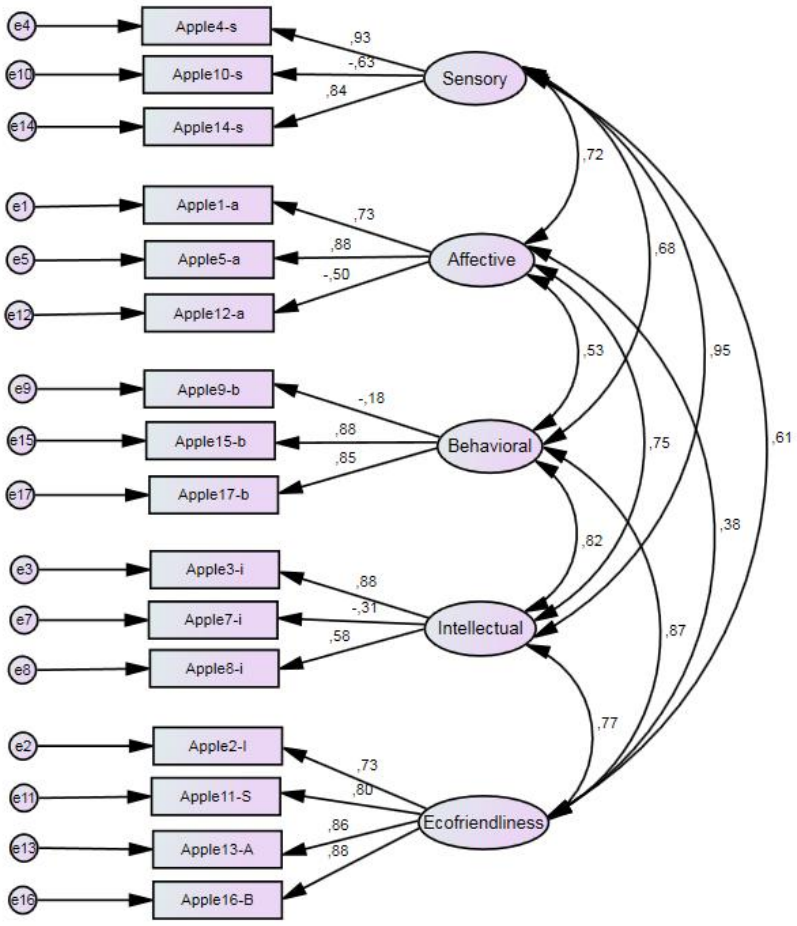
Figure 12. CFA of Model 3 for Nokia



When comparing the CFA of Model 3 for Apple in Figure 13 (data set of 506 responses) with the CFA of Model 3 for the combined three brands, on the sensory dimension the loadings for the 14-s item (This brand makes a strong impression on my visual sense or other senses) is minimally smaller for Apple, however, the 4-s (I find this brand interesting in a sensory way) and the negative item are slightly higher than for the combined three brands. In the case of the affective dimension, the loadings for all of the affective items are minimally or slightly lower for Apple than for the combined three brands. What comes to the behavioral dimension, the loading for the 17-b item (I engage in physical actions and behaviors when I use this brand) is slightly lower for Apple, however, for the other positive item the loading is exactly the same. The loading on the negative item is slightly lower for Apple. In the case of the intellectual dimension, the loading on the 8-i item (I engage in a lot of thinking when I encounter this brand) is slightly lower for the Apple brand, as well for the negative item, but then for the other positive item the loading for Apple is minimally higher. And finally for the dimension on eco-friendliness, the loadings for the sensory and behavioral items the

loadings are the same for Apple and the three brands combined, however, for the intellectual and affective items the loadings are slightly lower for the Apple brand.

Figure 13. CFA of Model 3 for Apple



The correlations between the four exogenous variables in the Model 3 were again reviewed per brand for collinearity and compared to the correlations for the combined three brands, to check if there are correlations that are greater than 0.8 or 0.9 (Table 16). Also, in the case of the individual brands as well as for the three brands, in Model 3 there is a fairly high correlation between the intellectual and sensory factors which suggests that there may be a lack of discrimination between these constructs. Just as it was in the case of Model 1 and Model 2, it is again the Nokia brand, where the correlation is the highest between the intellectual and sensory factors. However, also for Samsung there are some high correlations, above .9, between the sensory and affective variables as well as between the intellectual and affective variables, but this is not the case for the other two brands.

The collinearity between the eco-friendliness and other four variables in the BBX model are acceptable, even though there seems to be some indication of higher correlation between the eco-friendliness and behavioral variables, otherwise the correlations for the eco-friendliness variables are well below .85.

Table 16. Correlations between the exogenous variables for Model 3 for the combined data on the three brands and each of the brands individually

Model 3			3 brands	Samsung	Nokia	Apple
Sensory	<-->	Affective	.74	.91	.65	.72
Behavioral	<-->	Affective	.54	.74	.39	.53
Intellectual	<-->	Behavioral	.84	.86	.84	.82
Intellectual	<-->	Affective	.80	.92	.77	.75
Intellectual	<-->	Sensory	.95	.92	.99	.95
Behavioral	<-->	Sensory	.71	.73	.72	.68
Ecofriendliness	<-->	Intellectual	.80	.82	.81	.77
Ecofriendliness	<-->	Behavioral	.85	.84	.82	.87
Ecofriendliness	<-->	Affective	.49	.75	.36	.38
Ecofriendliness	<-->	Sensory	.68	.69	.73	.61

To conduct further analysis of the negatively worded items in the BBX scale, the negatively worded items were reversecoded by reversing the coding of the negative variables in SPSS. The model fit indices for the models with reversecoded items do not differ significantly from the results including the negatively worded items. See below in Table 17 the comparison of the results for the two sets for the combined results of the three brands. The values for chi square and RMSEA raise minimally, however the TLI and CFI values slightly improve.

Table 17. Model fit indices for the models with the negatively worded items and models with reversecoded items

Model Fit Indices	Four-factor model without eco-friendliness	Four-factor model NEGATIVES REVERSE-CODED	Four-factor model with eco-friendliness embedded	Eco embedded NEGATIVES REVERSE-CODED	Five-factor model	Five-factor model NEGATIVES REVERSE-CODED
Chi-square	1006.007	1100.146	3188.279	3316.185	1674.166	1752.545
Degrees of freedom	48	48	98	98	94	94
Probability level	0	0	0	0	0	0
TLI (Tucker Lewis Index)	.818	.84	.681	.713	0.83	.846
CFI (Compara-tive Fit Index)	.888	.902	.770	.793	0.883	.893
RMSEA	.115	.120	.144	.147	0.105	.108

5 DISCUSSION

The positioning of the environmental dimension in the BBX scale was tested with four items on eco-friendliness, one designed for each of the four brand experience dimensions used in the BBX model: affective, sensory, behavioral, intellectual. First, the four-factor BBX model was used without the additional items on eco-friendliness for testing how the results could be replicated with the data set collected in this study. Then the four-factor model was tested with an eco-friendliness item added in each of the four factors. And finally, the extended BBX model with a separate factor for the eco-friendliness items was tested.

The research questions have been answered with the results of this study (summarized in Table 18), and CFA on the three models studied in this research provide evidence that the best model fit was in the case of the third five-factor model with a separate factor including items on eco-friendliness. For the third model the model fit indices were the best and the factor loadings were the highest. The eco-friendliness dimension is a separate dimension that consists of the four dimensions included in the BBX scale. At this point, it has not been tested whether the eco-friendliness dimension could have some other items as well, however, the eco-friendliness dimension emerges very strongly from the extended BBX scale as it is now defined with items formulated based on the existing four dimensions.

Table 18. Research questions and answers

Model	Research Question	Answer
1	Can the original four-factor BBX model be replicated with a data set on high-tech brands collected from Finland?	The data fits the model but the incremental fit statistics are not the best for this model.
2	Is the eco-friendliness dimension embedded in the four-factor BBX model?	The data does not fit this model well and the model fit indices are not satisfactory for this model.
3	Is the eco-friendliness dimension a separate fifth dimension requiring that the original four-factor model is extended into a five-factor model?	The data fits this model the best as the model fit indices also indicate. Also the factor loadings in the CFA are the best for this model, especially for the items on eco-friendliness.

5.1 Model Fit Indices of the Models

When comparing the model fit indices of each of the three models separately (See Table 19 below), one can see that in the case of first original BBX model with the original brand experience dimensions, the fit indices were the following: CFI = .888, TLI = .818 and RMSEA = .115, all indicating acceptable fit, and ^{2} (48) = 1006.01, p < .000. The absolute fit index chi-square, indicates that the data fits the original BBX model, but the value of RMSEA does not suggest a very good fit. However, the TLI and CFI indicated that, the model provided a reasonable fit and proved that the original BBX model is applicable also in the case of high-technology products. When the three brands were analyzed individually, it showed that the fit indices for Samsung are even better than the combined responses for the three brands, which is an indication that the data fits the original BBX model very well in the case of Samsung. In the CFA, the factor loadings are all very high for the positive statements, which is the best indicator for a common factor.

In the second model, the additional items on eco-friendliness were embedded in the four factors of the original BBX model in order to investigate whether eco-friendliness is included in the four brand experience dimensions of the original BBX model. From the three models analyzed in this study, the model fit indices were the least satisfactory for this second model, and also the fit indices for the individual brands are not acceptable. The fit indices were: CFI = .770, TLI = .681 and RMSEA = .144 and chi square (98) = 3188.28, p < .000. Also, the factor loadings in the CFA do not have as high loadings for the affective (.54) and sensory (.60) dimensions, as for the behavioral (.85) and intellectual (.73) dimensions.

With the third model, the target was to analyze whether there could actually be an additional dimension of eco-friendliness included in the model. In this model, the fit indices are the best of the three models analyzed in this study: CFI = .883, TLI = .830 and RMSEA = .105, all indicating acceptable fit, and chi square (94) = 1674.17, p < .000, also the the model fit indices for the brands individually prove to be the best of the three models. The factor loadings in CFA are very good for the positive items of this model and they are the highest of the three studied models. For the third model, the absolute fit index, chi square is at 1674.16 which is satisfactory, as the chi square can be close to N (N=1518 in this reasearch). The degrees of freedom for the third model is 94 and the *p* value is .000. The chi square increases as a function of degrees of freedom (Iacobucci, 2010) and in the model 3 the degrees of freedom is nearly twice as high as in the first model.

Table 19. Model fit indices for the three structural models evaluated

Model Fit Indices	1) Original BBX Model				2) Eco-friendliness embedded				3) Eco-friendliness dimension			
Brands	**3 Brands**	**Samsung**	**Nokia**	**Apple**	**3 Brands**	**Samsung**	**Nokia**	**Apple**	**3 Brands**	**Samsung**	**Nokia**	**Apple**
Chi square	1006.0	373.6	383.4	382.4	3188.3	1023.4	1176.9	1167.4	1674.2	635.3	651.3	637.9
Degrees of freedom	48	48	48	48	98	98	98	98	94	94	94	94
Probabi-lity level	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
TLI	.818	.843	.792	.791	.681	.748	.650	.639	.830	.846	.811	.808
CFI	.888	.903	.872	.872	.770	.818	.747	.740	.883	.894	.870	.868
RMSEA	.115	.116	.118	.117	.144	.137	.148	.147	.105	.107	.108	.107

When interpreting the results, one should remember the size of the sample especially when examining the chi-square value, if it is interpreted alone it can often lead to the model having to be rejected, particularly with larger samples (Janssens *et al.*, 2008). Even though Brakus et al. (2009) state that Bagozzi and Heatherton (1994) question the usefulness of the chi-square statistic in models similar to theirs, in this research it proved to be a measure that supported the model fit. Thus, in this study this fit statistics proved to be relevant in this context.

The cut-off for the RMSEA can be placed in several places. According to Janssens (2008), Hu and Bentler (1999) place the cut-off at .06, and Browne and Cudeck (1993) have asserted that values less than or equal to .05 indicate a good fit and values up to .08 indicate an acceptable fit, and values close to .10 can still be considered to be a satisfactory fit. However, some of the most reliable indices for determining the overall fit of the measurement model are the TLI and the CFI, which both should preferably be greater than .90 (Janssens *et al.*, 2008).

When looking at the model fit results for the individual brands, one needs to remember that the N is 506 instead of 1518 especially in the case of the chi square results. All in all, the responses for Samsung fit both the first and third model the best from the three brands, as all the fit indices were systematically slightly better for Samsung. For Nokia and Apple, on the other hand, for the first and third model, the figures were very similar for all of the fit indices, expect for the chi square in the third model, where Apple had a chi square that is closer to Samsung.

5.2 Factor Loadings for the Models

When examining the factor loadings for the combined responses of the three brands, it can be seen that they are fairly high for the positive items, especially for the sensory, affective and behavioral dimensions. The negatively worded items have negative loadings, of which the sensory and affective items have the highest absolute value. In the second model, when the items on eco-friendliness are embedded in the four dimensions, the loadings for the affective dimension are not as high as earlier, the other dimensions are still fairly high. However, the items on eco-friendliness in the second model are not loading highly on the affective and sensory dimensions. Whereas in the third model all of the items on eco-friendliness have very high factor loadings as a part of a separate eco-friendly dimension. The results of the CFA for third model show that all the items for the eco-friendliness dimension have factor loadings above .70 (affective .90, behavioral .88, sensory .80 and intellectual .76). In the third model, also the loadings on the other dimensions are very high and equivalent to the values in the first model. See in the Table 20 below for the full listing of the factor loadings for all of the tested models in the case of the combined responses for the three brands. The factor loadings per brand have also been listed below for each of the models (Tables 21-23).

Table 20. Factor loadings for each model in the case of the combined responses for 3 brands

Item	Statement	Model 1	Model 2	Model 3
SENSORY				
ThreeBrand_14-s	This brand makes a strong impression on my visual sense or other senses. (sight, touch, hearing, taste, smell).	.86	.87	.86
ThreeBrand_4-s	I find this brand interesting in a sensory way. (sight, touch, hearing, taste, and smell).	.91	.89	.90
ThreeBrand_10-s	This brand does not appeal to my senses. (sight, touch, hearing, taste, and smell).	-.59	-.57	-.59
ThreeBrand_11-S	This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	NA	.60	NA
AFFECTIVE				
ThreeBrand_1-a	This brand induces feelings and sentiments.	.78	.76	.78
ThreeBrand_12-a	I do not have strong emotions for this brand.	-.59	-.58	-.60
ThreeBrand_5-a	This brand is an emotional brand.	.90	.87	.90
ThreeBrand_13-A	This brand creates eco-friendly emotions.	NA	.54	NA
BEHAVIORAL				
ThreeBrand_17-b	I engage in physical actions and behaviors when I use this brand.	.86	.89	.88
ThreeBrand_15-b	This brand results in bodily experiences.	.90	.87	.88
ThreeBrand_9-b	This brand is not action oriented.	-.23	-.22	-.23
ThreeBrand_16-B	This brand makes me behave in an eco-friendly way.	NA	.85	NA
INTELLECTUAL				
ThreeBrand_8-i	I engage in a lot of thinking when I encounter this brand.	.64	.66	.64
ThreeBrand_7-i	This brand does not make me think.	-.42	-.39	-.40
ThreeBrand_3-i	This brand stimulates my curiosity and problem solving.	.84	.88	.86
ThreeBrand_2-I	This brand makes me think about the state of the environment.	NA	.73	NA

ECO-FRIENDLINESS				
ThreeBrand _2-I	This brand makes me think about the state of the environment.	NA	NA	.76
ThreeBrand _11-S	This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	NA	NA	.80
ThreeBrand _13-A	This brand creates eco-friendly emotions.	NA	NA	.90
ThreeBrand _16-B	This brand makes me behave in an eco-friendly way.	NA	NA	.88

When comparing the factor loadings in Models 1, 2 and 3 in the case of Samsung (Table 21), one can see that for the sensory dimension the loadings in Models 1 and 3 are exactly the same, while in Model 2 the loadings for each sensory item is slightly lower. This pattern repeats itself also in the case of the affective dimension, so that in Models 1 and 2 the factor loadings are very close to each other, while for Model 2 the factor loadings are lower. In the behavioral dimension the loading for 17-b is minimally lower in Model 1 compared to Models 2 and 3, while for the 15-b loading Model 1 has the highest of the three loadings. In the negative behavioral item again the loading is lowest for Model 2 compared to Models 1 and 3. For the intellectual item 8-I the loadings are exactly the same for the three Models, and the Model 2 has exceptionally a slightly higher loading for the 3-i item.

To summarize the factor loadings in all of the three models in the case of Samsung are very close to each other for each of the items, the biggest differences are in the factor loadings for the negative items per dimension. In the case of the eco-friendliness items in Model 2, the loading for the affective eco-friendly item is the lowest at .60, but when the eco-friendliness dimension is a fifth dimension, the loadings range from .79 to .92 which are all very high factor loadings.

Table 21. Factor loadings for each model in the case of the Samsung brand

Item	Statement	Model 1	Model 2	Model 3
SENSORY				
Smsg_14-s	This brand makes a strong impression on my visual sense or other senses. (sight, touch, hearing, taste, smell).	.88	.89	.88
Smsg _4-s	I find this brand interesting in a sensory way. (sight, touch, hearing, taste, and smell).	.92	.90	.92
Smsg _10-s	This brand does not appeal to my senses. (sight, touch, hearing, taste, and smell).	-.59	-.56	-.59
Smsg _11-S	This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	NA	.60	NA
AFFECTIVE				
Smsg _1-a	This brand induces feelings and sentiments.	.74	.71	.73
Smsg _12-a	I do not have strong emotions for this brand.	-.55	-.53	-.54
Smsg _5-a	This brand is an emotional brand.	.92	.89	.93
Smsg _13-A	This brand creates eco-friendly emotions.	NA	.77	NA
BEHAVIORAL				
Smsg _17-b	I engage in physical actions and behaviors when I use this brand.	.89	.90	.90
Smsg _15-b	This brand results in bodily experiences.	.93	.91	.92
Smsg _9-b	This brand is not action oriented.	-.22	-.19	-.21
Smsg _16-B	This brand makes me behave in an eco-friendly way.	NA	.85	NA
INTELLECTUAL				
Smsg _8-i	I engage in a lot of thinking when I encounter this brand.	.73	.73	.73
Smsg _7-i	This brand does not make me think.	-.52	-.49	-.51
Smsg _3-i	This brand stimulates my curiosity and problem solving.	.90	.91	.90
Smsg _2-I	This brand makes me think about the state of the environment.	NA	.80	NA
ECO-FRIENDLINESS				
Smsg _2-I	This brand makes me think about the state of the environment.	NA	NA	.80
Smsg _11-S	This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	NA	NA	.79
Smsg _13-A	This brand creates eco-friendly emotions.	NA	NA	.92
Smsg _16-B	This brand makes me behave in an eco-friendly way.	NA	NA	.90

When comparing the factor loadings in Models 1, 2 and 3 in the case of Nokia (Table 22), one also notices that for the sensory dimension the loadings do not differ greatly between the three models for the positive items, however, in Model 2 the negative item gets a slightly smaller loading. For the affective dimension, the Models 1 and 3 again follow a similar pattern in the loadings and in Model 2 again the loading for the negative item is slightly smaller. For the behavioral dimension, the loadings for all of the items are very similar for all of the three models. In the case of the intellectual dimension, the Model 1 has the highest loading for the negative item, and the lowest for the 3-i item, while in Model 2 the positive items have slightly higher loadings than in

the Models 1 and 3. To summarize the factor loadings in all of the three models are very close to each other for each of the items, the biggest differences are in the factor loadings for the intellectual dimension.

In the case of the eco-friendliness items in Model 2, the loading for the affective eco-friendly item is the lowest at .46, but when the eco-friendliness dimension is a fifth dimension, the loadings range from .74 to .91 which are all very high factor loadings.

Table 22. Factor loadings for each model in the case of the Nokia brand

Item	Statement	Model 1	Model 2	Model 3
SENSORY				
Nokia _14-s	This brand makes a strong impression on my visual sense or other senses. (sight, touch, hearing, taste, smell).	.86	.87	.87
Nokia _4-s	I find this brand interesting in a sensory way. (sight, touch, hearing, taste, and smell).	.87	.86	.86
Nokia _10-s	This brand does not appeal to my senses. (sight, touch, hearing, taste, and smell).	-.52	-.50	-.52
Nokia _11-S	This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	NA	.66	NA
AFFECTIVE				
Nokia _1-a	This brand induces feelings and sentiments.	.78	.75	.78
Nokia _12-a	I do not have strong emotions for this brand.	-.62	-.60	-.63
Nokia _5-a	This brand is an emotional brand.	.85	.84	.84
Nokia _13-A	This brand creates eco-friendly emotions.	NA	.46	NA
BEHAVIORAL				
Nokia _17-b	I engage in physical actions and behaviors when I use this brand.	.88	.89	.89
Nokia _15-b	This brand results in bodily experiences.	.83	.81	.82
Nokia _9-b	This brand is not action oriented.	-.31	-.31	-.32
Nokia _16-B	This brand makes me behave in an eco-friendly way.	NA	.85	NA
INTELLECTUAL				
Nokia _8-i	I engage in a lot of thinking when I encounter this brand.	.59	.60	.59
Nokia _7-i	This brand does not make me think.	-.35	-.31	-.33
Nokia _3-i	This brand stimulates my curiosity and problem solving.	.78	.84	.79
Nokia_2-I	This brand makes me think about the state of the environment.	NA	.70	NA
ECO-FRIENDLINESS				
Nokia _2-I	This brand makes me think about the state of the environment.	NA	NA	.74
Nokia _11-S	This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	NA	NA	.81
Nokia _13-A	This brand creates eco-friendly emotions.	NA	NA	.91
Nokia _16-B	This brand makes me behave in an eco-friendly way.	NA	NA	.86

Finally, when comparing the factor loadings in Models 1, 2 and 3 for the Apple brand (Table 23), for the sensory dimension the loadings do not differ greatly between the three models for any of the items, including the negative item. For the affective dimension, the Model 1 has the highest loading for the 5-a item, while Model 3 has the highest loadings for the other positive item and the negative item. For the behavioral dimension, the 15-b item gets a very high loading in Model 1 compared to Models 2 and

3, however then for the 17-b item it is clearly lower for the Model 1, while the negative item gets similar loadings in all of the three models. For the intellectual dimension, the items get very similar loadings in all of the three models. To summarize the factor loadings in all of the three models are very close to each other for each of the items, the biggest differences are in the factor loadings for the behavioral dimension.

In the case of the eco-friendliness items in Model 2, the loading for the affective eco-friendly item is the lowest at .41, but when the eco-friendliness dimension is a fifth dimension, the loadings range from .73 to .88 which are high factor loadings.

Table 23. Factor loadings for each model in the case of the Apple brand

Item	Statement	Model 1	Model 2	Model 3
SENSORY				
Apple_14-s	This brand makes a strong impression on my visual sense or other senses. (sight, touch, hearing, taste, smell).	.84	.85	.84
Apple _4-s	I find this brand interesting in a sensory way. (sight, touch, hearing, taste, and smell).	.93	.92	.93
Apple _10-s	This brand does not appeal to my senses. (sight, touch, hearing, taste, and smell).	-.63	-.62	-.63
Apple _11-S	This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	NA	.53	NA
AFFECTIVE				
Apple _1-a	This brand induces feelings and sentiments.	.72	.71	.73
Apple _12-a	I do not have strong emotions for this brand.	-.48	-.48	-.50
Apple _5-a	This brand is an emotional brand.	.89	.85	.88
Apple _13-A	This brand creates eco-friendly emotions.	NA	.41	NA
BEHAVIORAL				
Apple _17-b	I engage in physical actions and behaviors when I use this brand.	.80	.86	.85
Apple _15-b	This brand results in bodily experiences.	.95	.87	.88
Apple _9-b	This brand is not action oriented.	-.17	-.17	-.18
Apple _16-B	This brand makes me behave in an eco-friendly way.	NA	.86	NA
INTELLECTUAL				
Apple _8-i	I engage in a lot of thinking when I encounter this brand.	.58	.60	.58
Apple _7-i	This brand does not make me think.	-.33	-.32	-.31
Apple _3-i	This brand stimulates my curiosity and problem solving.	.88	.89	.88
Apple _2-I	This brand makes me think about the state of the environment.	NA	.69	NA
ECO-FRIENDLINESS				
Apple _2-I	This brand makes me think about the state of the environment.	NA	NA	.73
Apple _11-S	This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	NA	NA	.80
Apple _13-A	This brand creates eco-friendly emotions.	NA	NA	.86
Apple _16-B	This brand makes me behave in an eco-friendly way.	NA	NA	.88

5.3 Criterion Validity

Criterion-related validity is indicated by doing a comparison of the scores from the studied measurement instrument with some external variables that can provide a direct measure of the measured feature (Zaichkowsky, 1985). Also generalizations as external validity and construct validity need to be verified by replication (Armstrong, 2003, Hubbard and Lindsay, 2013b). This study being a replication of the BBX scale, offers some criterion validity for both of the studies in question. In this study, the already established BBX scale was used as the basis to create a new extended measurement scale with a new construct of eco-friendliness. In the case of a conceptual replication, such as the once one used in this study, a conceptual framework from a previous study is used but some of the independent variables may be different from the original study (Raman, 1994).

The two extended measurement scales have been modified based on the BBX measurement scale, so that the four dimensions from the original BBX scale are unaltered and only one additional dimension is added to reflect better the consumer trend of eco-friendliness that has already been taken into account, for example, in the automobile industry. The fact the model fit indices for the original BBX model were good also in this study, indicated that the scale is applicable for high-tech mobile phone brands.

Another type of validity that was examined in the scales was the criterion validity of the scales in comparison with some known consumer groups. This was done by analyzing the responses from the perspective of specific sociodemographic variables. The two major criterion groups relevant for this study are female consumers and younger consumers.

The eco-friendly attitudes and purchasing behavior of female consumers has been studied, and it has clearly been shown that female consumers are more environmentally conscious than male consumers (Roberts, 1996) and women give higher priority to altruism than men, which is the value that is the most closely related to environmentalism (Dietz *et al.*, 2002). Based on the data collected for this study, the scores for the genders were compared, and the results are in line with the general tendency of women to favor eco-friendliness in their views.

In this study, for all of the four environmental items, the responses of the women were significantly more pro-environmental than for the men ($p < 0.01$). Table 24 below shows the means for the eco-friendliness of females compared to males. As shown in the table, the criterion groups in this study differed just as was the expectation for the eco-

friendliness dimension, thus the criterion validity of the extended BBX scale can be said to be very good.

Table 24. Means, standard deviations and p-values for responses of women and men

	INTELLECTUAL			SENSORY			AFFECTIVE			BEHAVIORAL		
	This brand makes me think about the state of the environment.			This brand makes an eco-friendly impression.			This brand creates eco-friendly emotions.			This brand makes me behave in an eco-friendly way.		
	p = .003			p = .009			p = .000			p = .002		
	Mean	N	S.D.	Mean	N	S.D.	Mean	N	S.D.	Mean	N	S.D.
F	3.24	587	1.413	3.33	523	1.250	3.20	556	1.212	2.80	579	1.296
M	3.02	692	1.527	3.22	654	1.423	2.97	674	1.427	2.68	693	1.366

Political consumerism is something that should be considered as one of the reasons why younger consumers may do their purchasing decisions on a different basis than older consumers, and young people have stated that they consider ethical, political, or environmental aspects when purchasing products, at least periodically (Stolle *et al.*, 2005). The value-basis theory of environmental attitudes has also been proven to apply among young adults and their environmental attitudes were the result of a person's more general set of values (Schultz and Zelezny, 1999).

In this study, with reference to the age groups, the 55-64 year olds consider in some brand dimensions more eco-friendly aspects than the 25-35 years olds ($p < .05$), and the 18-24 year olds ($p < .1$) (See Table 25).

Table 25. Means, standard deviations and p-values for the age groups 18-24 and 55-64 year olds, and 25-34 and 55-64 year olds

Comparison of age groups		INTELLECTUAL This brand makes me think about the state of the environment.			SENSORY This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)		
Age group 1	Age group 2	Mean diff.	S.D.	p	Mean diff.	S.D.	p
18-24	55-64	- .36	.142	.076	- .34	.138	.095
25-34	55-64	- .36	.123	.025			

Another way to demonstrate criterion validity is to compare the average means per brand from the scores. In order to verify the criterion validity of the new scale, the means for each item per brand were also compared to see whether the respondents had understood the scale similarly. The verification was done in the same way as was done by Brakus et al. Ratings on all of the three brands were consistent as can be seen from the means that range from 3.55 to 5.61 and the highest standard deviation is 2.51 which indicates that the respondents seem to have understood the scale in the same way, thus

the data supports the criterion validity of the scale. The mean for the responses to the environmental statements ranges from 3.55 to 4.41 which shows that the respondents have understood the scale for these items very well. The means, standard deviation and standard error means for each scale item per brand are presented in Table 26 below.

Table 26. Mean values for the items in the extended measurement scale per brand

Items	N	Mean	Std. Deviation	Std. Error Mean
SAMSUNG				
Smsg1-a- This brand induces feelings and sentiments.	506	4,55	2,006	,089
Smsg2-I- This brand makes me think about the state of the environment.	506	3,77	2,276	,101
Smsg3-i- This brand stimulates my curiosity and problem solving.	506	4,03	2,229	,099
Smsg4-s- I find this brand interesting in a sensory way. (sight, touch, hearing, taste, and smell).	506	4,30	2,164	,096
Smsg5-a- This brand is an emotional brand.	506	3,98	2,143	,095
Smsg7-i- This brand does not make me think.	506	4,89	1,947	,087
Smsg8-i- I engage in a lot of thinking when I encounter this brand.	506	3,86	2,210	,098
Smsg9-b- This brand is not action oriented.	506	4,99	2,141	,095
Smsg10-s- This brand does not appeal to my senses. (sight, touch, hearing, taste, and smell).	506	4,65	2,068	,092
Smsg11-S- This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	506	4,39	2,332	,104
Smsg12-a- I do not have strong emotions for this brand.	506	5,23	1,858	,083
Smsg13-A- This brand creates eco-friendly emotions	506	4,04	2,351	,105
Smsg14-s- This brand makes a strong impression on my visual sense or other senses. (sight, touch, hearing, taste, and smell).	506	4,24	2,168	,096
Smsg15-b- This brand results in bodily experiences.	506	3,83	2,379	,106
Smsg16-B- This brand makes me behave in an eco-friendly way.	506	3,66	2,355	,105

Items	N	Mean	Std. Deviation	Std. Error Mean
Smsg17-b- I engage in physical actions and behaviors when I use this brand.	506	3,80	2,478	,110
NOKIA				
Nokia1-a- This brand induces feelings and sentiments.	506	5,61	1,414	,063
Nokia2-I- This brand makes me think about the state of the environment.	506	3,93	2,052	,091
Nokia3-i- This brand stimulates my curiosity and problem solving.	506	4,15	2,006	,089
Nokia4-s- I find this brand interesting in a sensory way. (sight, touch, hearing, taste, and smell).	506	4,34	2,058	,092
Nokia5-a- This brand is an emotional brand.	506	4,94	1,818	,081
Nokia7-i- This brand does not make me think.	506	4,10	1,976	,088
Nokia8-i- I engage in a lot of thinking when I encounter this brand.	506	4,14	1,978	,088
Nokia9-b- This brand is not action oriented.	506	4,72	2,094	,093
Nokia10-s- This brand does not appeal to my senses. (sight, touch, hearing, taste, and smell).	506	4,08	1,985	,088
Nokia11-S- This brand makes an eco-friendly impression. (eco-friendly=not environmentally harmful)	506	4,41	2,178	,097
Nokia12-a- I do not have strong emotions for this brand.	506	3,91	1,929	,086
Nokia13-A- This brand creates eco-friendly emotions.	506	4,07	2,126	,095
Nokia14-s- This brand makes a strong impression on my visual sense or other senses. (sight, touch, hearing, taste, and smell).	506	4,29	1,945	,086
Nokia15-b- This brand results in bodily experiences.	506	3,81	2,200	,098
Nokia16-B- This brand makes me behave in an eco-friendly way	506	3,55	2,130	,095
Nokia17-b- I engage in physical actions and behaviors when I use this brand.	506	3,66	2,292	,102

Items	N	Mean	Std. Deviation	Std. Error Mean
APPLE				
Apple1-a- This brand induces feelings and sentiments.	506	5,25	1,905	,085
Apple2-I- This brand makes me think about the state of the environment.	506	3,96	2,372	,105
Apple3-i- This brand stimulates my curiosity and problem solving.	506	4,10	2,330	,104
Apple4-s- I find this brand interesting in a sensory way. (sight, touch, hearing, taste, and smell).	506	4,33	2,286	,102
Apple5-a- This brand is an emotional brand.	506	4,60	2,195	,098
Apple7-i- This brand does not make me think.	506	4,74	2,047	,091
Apple8-i- I engage in a lot of thinking when I encounter this brand.	506	4,07	2,246	,100
Apple9-b- This brand is not action oriented.	506	5,08	2,267	,101
Apple10-s- This brand does not appeal to my senses. (sight, touch, hearing, taste, and smell).	506	4,71	2,163	,096
Apple11-S- This brand makes an eco-friendly impression. (eco-friendly = not environmentally harmful)	506	4,20	2,399	,107
Apple12-a- I do not have strong emotions for this brand.	506	5,03	2,025	,090
Apple13-A. This brand creates eco-friendly emotions.	506	3,91	2,350	,104
Apple14-s- This brand makes a strong impression on my visual sense or other senses. (sight, touch, hearing, taste, and smell).	506	4,48	2,177	,097
Apple15-b- This brand results in bodily experiences.	506	3,80	2,420	,108
Apple16-B- This brand makes me behave in an eco-friendly way.	506	3,55	2,388	,106
Apple17-b- I engage in physical actions and behaviors when I use this brand.	506	3,68	2,506	,111

It is to be noted, that for one affective item the Nokia brand has clearly a higher mean value than Apple and Samsung ("Nokia1-a- This brand induces feelings and sentiments") with a mean of 5.61, however, also Apple has a high mean for this item at 5.25. Also another affective item (- I do not have strong emotions for this brand) has high means for Apple it is 5.03 and Samsung 5,23. However, the actual responses that consumers gave to the items measuring the eco-friendliness of the brands did not score high, which is an indication that the respondents do not think that any of the mobile phone brands included in the survey would enable an eco-friendly brand experience.

Table 27 below lists the means for the three brands in this study on the 5 dimensions as well as a mean for the overall experience. It shows that there are not that great differences between the three brands. The most noticeable is the slightly higher difference on the affective dimension for Nokia (4.60) and Apple (4.42) compared to Samsung (4.03), also for the eco-friendly dimension there is a distinct difference between the means, for Nokia it is the highest (3.30) and for Apple (2.95) and Samsung it is lower (2.88). The validity of the BBX scale with the eco-friendliness dimension is supported by the fact that the means of the scores are rather close to each other. Also it can be seen that the respondents have judged the eco-friendliness of high-tech brands fairly similarly, which suggests that consumers seem to be suspicious of the eco-friendliness of high-tech companies and brands.

Table 27. Average Means per Brand for the Experience Dimensions - Data collected from Finland

Brand	Sensory	Affective	Intellectual	Behavioral	Eco-friendly	Overall Experience
Nokia	3.76	4.60	3.66	3.24	3.30	3.71
Samsung	3.63	4.03	3.56	3.09	2.95	3.45
Apple	3.77	4.42	3.51	3.00	2.88	3.52

Brakus et al. had the same brands in their research on brand experience, with the slight difference that the brand for Apple was referring mainly to the iPod. When comparing the means for the experiences of the present study to the means reported in the study of Brakus et al. (2009) (see Table 28 below) the main significant difference is that four years earlier the Apple iPod got the highest means for all of the four dimensions, and naturally, there is no result for the eco-friendly dimension in their research. Back then also Nokia got higher means for all of the experiential dimensions than Samsung. It is to be noted that when comparing the figures with the present study, that Brakus et al. (2009) did not have the option 8="Do not know" in their scale. This has an effect on the mean, as people reply with 4 when in doubt. Otherwise the average means in both of these studies are in line with each other.

Table 28. Average Means per Brand for the Experience Dimensions - study of Brakus et al.

Brand	Sensory	Affective	Intellectual	Behavioral	Eco-friendly	Overall Experience
Nokia	4.63	3.71	4.14	4.56	NA	4.26
Samsung	4.32	3.32	3.87	3.91	NA	3.86
Apple iPod	5.70	5.03	4.63	5.24	NA	5.15

5.4 Reliability and Validity

The concept of reliability refers to the consistency in the research and it is used to estimate how probable it is that the same result can be achieved with different samples when the measure is the same one (Ketokivi, 2009, Churchill, 1979). Reliability can also be considered to be internal consistency that is the extent to which the measurement instrument does to not have errors and can thus produce persistently accurate measurements of the construct in question (Churchill, 1979). Validity is not a characteristic of the measurement instrument, but of the scores and the interpretations of the scores of the instrument and it should be demonstrated separately for the different intended interpretations (Cook and Beckman, 2006). The validity of the interpretations is always an issue of extent and the scores of the measurement instrument will never be quite perfectly accurate in depicting the construct being measured, so validity can be considered to be an interpretive argument and evidence is required for supporting the suggested inferences (Cook and Beckman, 2006).

5.4.1 Reliability

Reliability is dependent on the degree of variation among the scores that is dependent on random errors, so for a totally reliable measure there would thus be no random sources of error (Churchill, 1979). Reliability needs to be in place but it is not an adequate condition for validity to be automatically in place (Churchill, 1979, Cook 2006). There are three main types of reliability in quantitative research, referring to the degree to which a repeated measurement gives the same result, and over time, the stability of a measurement and the similarity of measurements (Golafshani, 2003).

In this research, the research procedure and the steps taken in the analysis have been documented above to allow transparency so that the study could also be repeated by different researchers later on with similar results. Also reliability refers how accurate a representation the study is of the total population being studied and whether the findings can be reproduced with similar methodology (Golafshani, 2003).

When designing the measurement scale, twelve of the items were taken from the original list of items created by Brakus et al. (2009) that were used in their research and

that were proven then to be reliable and valid, and four of the questions were designed specifically for this study. When designing the questionnaire, the wordings for each of the questions were thoroughly checked, first in an English version and then after that the text was translated into Finnish. The translations were checked by native Finnish speakers before sending it out to the respondents. The online survey enabled that the collected data was not affected by the presence of the interviewer, and the basic assumption is that the tendency of the respondents would have been to give more honest answers to the questions.

The measurement models were confirmed by running both EFA and CFA on the items which also helped to check the validity of the data collected for this study. In the EFA the results for the PCA indicated that the items of eco-friendliness mainly loaded on the first factor which made it worthwhile to proceed to the next phase in the study, and test what the results for the eco-friendliness items would be when analyzing the models with CFA.

The CFA was initiated by analyzing the first model that was the original BBX model. The goal of this first step was to verify whether the data collected for this study fit the original model of Brakus et al. The quality of the factor solution was verified with a CFA model and testing how it fits with the data and what is the covariance between the observed factors. The model fit indices for the original BBX scale in model 1 of this study indicated that the model fit was good and that the results from the study of Brakus et al. (2009) could be replicated in this study. The CFA model fit even improved when the measurement items on eco-friendliness developed in this study were added to it. This was a major finding also for this whole research.

There is also a need to validate this measure across several countries and cultures to ensure its applicability with consumers in different countries. The respondents used in the study of Brakus et al. (2009) were most probably only from the U.S., so the replication of the scale with respondents from Finland improved the reliability of the original BBX scale.

The consistency with which items on a questionnaire are responded to or how well an individual's scores stay similar at different times can be verified at two different time points with a test-retest method, and when the results stay relatively similar the measure can be referred to as being stable (Golafshani, 2003). When there is a great extent of stability it also indicates a great extent of reliability, and this in turn tell that the results can be repeated, however, in addition to the proved repeatability of a research instrument and its internal consistency, the instrument must also be valid (Golafshani, 2003). Not all agree on the need to use the test-retest approach, for example, according to Churchill (1979), the test-retest reliability should not be used, as the respondents' memories will have an impact of the scores, as they tend to reply to the items in the same way also in the second round and as a consequence the responses can correlate

over two separate measurement instances, even though they may not even correlate well within the measurement instrument.

The data collected in this study were analyzed using the reliability procedure (Cronbach's alpha) in SPSS and CFA in SPSS AMOS. The internal reliability of the scale was also tested with factor analyses, using varimax rotation with squared multiple correlations for extracting factors to see whether items loaded on a specific dimension or were vaguely distributed across factors. In order to enhance reliability there are two ways to do it, the analysis can be reiterated or the internal consistency can be tested. The most frequently used method for evaluating measure reliability is Cronbach's alpha that is used to summarize the degree to which a set of items are interrelated with each other (Churchill, 1979), for example the items in the BBX scale. The Cronbach's alpha can be used to estimate the reliability based on the internal consistency as it can be used to measure how the items in a measurement scale correspond to one uni-dimensional latent factor. When the Cronbach's alpha is nearly 1.0 the latent factor approaches being more unidimensional. The internal consistency of the BBX and different versions of the extended BBX scales was measured with Cronbach's coefficient alpha, which indicated the reliability of the scales. The closer Cronbach's Alpha is to 1.0 the better is the construct reliability and internal reliability of the solution.

In this study, the values for the Cronbach's Alpha factors are good which supports the construct validity of the research. The internal reliability of the four dimensions of brand experience was also assessed by calculating the Cronbach's alpha for each dimension using the 12-item scale. All values were satisfactory for all of the positive statements, and comparable to the results of Brakus et al. (2009). When the negatively worded items for the sensory, affective and intellectual dimensions are included in the reliability analysis, the Cronbach's alpha is negative due to a negative average covariance among items. For the behavioral dimension the Cronbach's alpha is very low also, even though it is not negative. The Cronbach's alpha for the full 12-item scale was .635. However, when the Cronbach's alpha is calculated only for the positive items in the scale it is .907, and only on the negative items, it is .689.

Also, the internal reliability of the four dimensions of brand experience were assessed by calculating the Cronbach's alpha for each dimension using the 16-item scale including the items on eco-friendliness. All values were satisfactory for the positive statements. When the negative items for the sensory, affective and intellectual dimensions are included in the reliability analysis, the values for the Cronbach's Alpha are very low due to a negative average covariance among the negatively worded items. This is logical when you think of the meaning of the statement, e.g. if a brand induces feelings and sentiments, and is an emotional brand, it cannot at the same time be something one does not have strong emotions for. The Cronbach's alpha for the full 16-item scale is .811. However, when the Cronbach's alpha is taken only for the positive items in the scale it is .934. There are no negatively worded environmental items. All in

all, the internal reliability of the extended BBX scale is better than that of the original BBX scale. The internal reliability of the five dimensions of brand experience was assessed by calculating the Cronbach's alpha for each dimension using the extended 16-item scale. The Cronbach's alpha for fifth eco-friendly dimension added to the original BBX model is .899 which indicates a very high level of reliability. So the internal consistency as well as the consistency over time as validated here give an indication of the reliability of the original BBX scale (model 1) and the extended scale BBX with eco-friendliness as a fifth dimension (model 3).

5.4.2 Validity

Valid measurement is essential when studying concepts in business as well as science, as validity tells the extent to which a measurement instrument is actually measuring the construct it has been designed to measure (Peter 1981, Cook 2006). A mandatory requirement for validity is that of reliability which refers to the internal consistency of the measure (Churchill, 1979). Validity can be checked from several perspectives: content validity, convergent validity, discriminant validity, nomological validity, as well as from the dimensionality perspective (Ketokivi, 2009). When the findings can be generalized, it can also be considered that there is external validity. The traditional division of validity into three different types, i.e. content, criterion, and construct validity has also been questioned and considered to be arbitrary, and according to this view, instead all validity could be conceptualized under "construct validity" and the concepts of content and criterion validity provide evidence for the overall construct validity (Cook 2006).

Construct validity is the most important indicator of measure validity and it is generally considered to have two aspects: convergent and discriminant validity (Peter, 1981). Convergent validity refers to the extent to which the results of repeated independent efforts to measure one construct are in line with each other, and discriminant validity refers to the degree to which the measures of different constructs are distinct (Peter, 1981). Construct validity refers to the question what the measurement instrument is actually measuring, the construct or concept that has been scored on a measure (Churchill, 1979). Theories cannot be developed if there is not also correspondence between the constructs and operationalization procedures, and construct validity is required for the development and testing of theories (Churchill 1979, Peter 1981). Construct validity can be assessed with different approaches: convergent validity, discriminant validity, concept validity, and nomological validity.

Convergent validity indicates does the scale correlate with measures that have been designed for similar concepts (Churchill, 1979, Ketokivi, 2009). High factor loadings demonstrate a high convergent validity (Ketokivi, 2009). Convergent validity was demonstrated by consistent high values for the factor loadings in model 1 and model 3 of this study. For all of the three models, all of the loadings for the positive statements

are significant as required for convergent validity, above .50. The lowest of the positive statements is .64 on the first and third model, and .54 in the second model. Factor loadings below .50 or so indicate variables that are not especially aligned with the factors, however, acceptable reliabilities even below .5 may be appear when the CFA model fits satisfactorily (Bagozzi and Yi, 2012). The absolute value of the loadings for the negatively worded items are used when analyzing the construct validity in this study. The negative items for the sensory and affective dimensions have factor loadings well above -.50 for all of the three models, and also the negative intellectual item has loadings of approximately -.40 for the three models. The only item that has a lower loading than the recommendation is the negatively worded behavioral item, where the loading is a little above -.20 for all of the three models. However, as this is only one item and as it is a negatively worded item, it is not considered to be meaningful when assessing the validity of the whole model, especially when the model fit indices are acceptable for the assessed models 1 and 3.

Discriminant validity indicates if the scale differs adequately from other similar scales (Churchill, 1979). The data and its validity is tested by CFA and the fit is studied by looking at the values for the RMSEA and CFI indices. As only one method of data collection was used, there is no method variance and also thus the discriminant validity is high. Also, the data was collected in a short period of time, via an online web survey.

Concept validity is crucial to ensure that also abstract concepts are understood in the same way by all of the respondents. The most critical aspect in the assessment of the validity of the measurement has to do with how well the factors and related data correspond to the concepts used in the study (Hair et al., 2010) and that the differences in the scores are reflecting actual differences that are apparent in the characteristic that the research is measuring (Churchill, 1979). In the case of the term eco-friendliness, it was made sure that it would be understood in the same way by all respondents, and it was defined in the survey questionnaire in the following way “eco-friendly = not environmentally harmful”. The BBX scale created by Brakus et al. (2009) was the starting point for building the conceptual validity of the extended scale in this study. Also based on a literature review other brand measurement scales were taken into account when considering the conceptual validity of the scale developed in this study. There were some assumptions made when the operationalization of the extended items was done that also had an effect on the overall validity of this study. To ensure validity of this study the references to the tested and validated measurement scale of Brakus et al. (2009) are relevant for this study.

In the case of **nomological validity** the goal is to test whether the scale can measure what has been theoretically assumed, and the focus is on the larger entity and whole theoretical framework instead of an individual concept. The research questions for this research were formulated on the basis of both earlier research by Brakus et al. (2009) as well as literature, and as this study was able to test and answer the research questions

fully, the validity of the whole research can be said to have been good. And as some of the questions in the survey, i.e. items in the measurement scale, were from an earlier research that had been validated, this study increased not only the validity of this study but that of the previous research that this study was replicating.

In some studies, there may be issues with validity, which have to do with the data collection process. However, in the case of this study, this is not an issue, as the data was collected from one country and in the same language. Also, as the data was collected with an online web survey, there should be no human impact on the measurement validity which may be the case when doing surveys with the help of interviewers, and in this situation there has been no need to demonstrate either any social desirability on the side of the respondents, as they have answered the questionnaire anonymously and they do not need to be responding in a culturally acceptable or appropriate way, instead they can present their honest views and feelings on the topic (Podsakoff *et al.*, 2003).

The CFA helps to generate measures of the overall fit of a certain measurement model including beneficial information on the degree to which convergent and discriminant validity obtained which makes CFA the most popular way of assessing psychometric properties of measuring instruments (Gerbing and Anderson, 1988). In this study, to evaluate all of the three measurement models, a validity and reliability check was performed based on the CFA, by analyzing Average Variance Extracted (AVE), item loading sizes, and convergent validity values individually on the latent variables for each of the models separately, consisting of the five dimensions: affective, sensory, behavioral, intellectual and eco-friendliness. The measures used for establishing validity and reliability are: AVE and Composite Reliability (CR), (Hair *et al.*, 2010).

For the first model, the reliability of all but one of the dimension is well above the recommendation, only the CR for the Intellectual dimension is .69 which is minimally smaller than the required threshold of 0.70. The convergent validity of all of the dimensions are very close to acceptable, only the AVE for the Intellectual dimension is .44 which slightly less than the required threshold of .50. (See Table 29).

Table 29. Reliability and validity metrics for Model 1

Model 1	CR	AVE
Behavioral	0.750	0.547
Sensory	0.841	0.644
Affective	0.811	0.594
Intellectual	0.690	0.444

For the second model, the reliability of all of the dimensions is well above the threshold of .7. However, the convergent validity of all of the dimensions of the affective and intellectual dimensions are under the required .5. This model does not fulfill the

requirement of convergent validity as there are two dimensions that do not fulfill the requirements. (See Table 30).

Table 30. Reliability and validity metrics for Model 2

Model 2	CR	AVE
Behavioral	0.823	0.572
Affective	0.788	0.494
Sensory	0.828	0.556
Intellectual	0.767	0.467

In the case of the third model, the reliability of all but one of the dimension is well above the recommendation, only the CR for the Intellectual dimension is .69 which is nearly the required threshold of 0.70. The convergent validity of all of the dimensions is very close to acceptable, only the AVE for the Intellectual dimension is .44 which slightly less than .50. The results for the four dimensions included in the first model are nearly the same as for the third model, however, the third model includes also the eco-friendliness dimension and the CR and AVE for the fifth dimension are clearly higher than for the other four dimensions. (See Table 31).

Table 31. Reliability and validity metrics for Model 3

Model 3	CR	AVE
Eco-friendliness	0.897	0.688
Sensory	0.840	0.644
Affective	0.811	0.595
Behavioral	0.750	0.547
Intellectual	0.689	0.444

All in all, the reliability and validity of the replicated and extended BBX scales are supportive of the model. The measures of reliability are as good as can be expected at this stage of the research into this topic. Also the convergent and discriminant validity are good. The criterion validity can be considered to be good for the measure of eco-friendliness. Even though the results here are only providing the first set of evidence of construct validity of the extended BBX scale, they indicate sufficient support for additional testing of the measurement scale. There is also additional evidence that the original BBX scale of Brakus et al. (2009) has reliability and validity, and in addition to the fact that it also included an additional dimension for eco-friendliness.

Before the actual survey was conducted, the survey questionnaire was piloted with people who had varying backgrounds, both educationally and with regard to nationality, in order to verify that the questionnaire was comprehended properly and that the respondents were able to provide answers that were needed for the study. In international and cross-country studies, it is crucial to estimate the dimensionality of the

measurement scale in the specific countries in scope of the study, in addition to estimating validity and reliability; when a scale can be applied in other countries the factor structure and factor loadings should be similar across the countries and cultures in scope of the research (Knight, 1997). In this study, also EFA has been used to assess the instrument dimensionality of the BBX scale.

5.4.3 MAGIC Criteria

When doing quantitative research, the theoretical part of the research is based on statistical argumentation that can be evaluated based on the Magnitude, Articulation, Generality, Interestingness and Credibility, which are the MAGIC criteria of Abelson (1995). In the case of this study, the magnitude of the results from the statistical analysis both from the statistical argumentation perspective and the theoretical and practical viewpoints are considerable. The number of respondents in this study provided statistically very strong evidence, and when the number was tripled by summing up the responses for the three brands, to get out the brand bias, the sample size became even more significant.

When considering the articulation of the research claim and the contribution of this research, one can suggest that the extended BBX measurement scale is clearly statistically valid and theoretically it means that the eco-friendliness aspect should also be taken into account when assessing consumers' brand experience of high-tech brands. Another implication of this finding suggests that high-tech companies should also take into account eco-friendliness aspects when they are designing and launching products for the consumer markets.

As the findings can be generalized, there is external validity. The theoretical finding of an eco-friendly dimension in the brand experience has also a general impact on the overall theory of measuring brand experiences, as it suggests that the eco-friendliness aspect in consumers' brand experiences and their creation needs to be taken into account. However, in order to make more profound generalizations, there needs to be further studies done in this area. When assessing the generality of the findings of this study, one needs to take into account that this is a replication research of a previous study on a BBX that was successfully replicated in this study, this indicates that the earlier findings of Brakus et al. (2009) can be generalized. The extended BBX scale with the eco-friendliness dimension is still something that would need to be tested more in the context of other product categories and countries.

The findings and arguments presented in this study are of interest to a wider audience as well, not only the Academia. In addition to having a theoretical contribution as the findings can be considered to introduce the construct of eco-friendliness into the brand experience, also the findings can be made use of when considering the relevance of

including eco-friendliness in the R&D and consumer marketing activities of high-tech companies.

And finally, to the last point in the MAGIC criteria: credibility requires that the research claim is methodologically sound and theoretically coherent so that the experimental procedures have been exact and statistical analyses properly done (Abelson, 1995). In this context the above account on the reliability and validity of the findings has targeted to answer to this question on credibility.

6 CONCLUSIONS

The goal of this thesis has been to study the gap in the research of measuring the eco-friendliness aspect in consumers' brand experiences and consider how high-tech companies that do not currently have the means to track how their consumers experience their brands with regard to eco-friendliness could benefit from such a measure. As one of the top trends in the consumer markets is still green consumerism and eco-friendliness, and in the sectors for fast-moving consumer goods and household appliances (McDonald *et al.*, 2009), as well as in the automobile industry (Kim, 2011) companies have progressed with providing eco-friendly options for consumers on the markets, it could be that in the future eco-friendliness is one of the key selling points for consumer electronics and high-tech products in the case of some green consumer groups. Also for the high-tech companies it is vital to maintain their reputation intact with regard to ESR requirements and activities (Diamantopoulos *et al.*, 2003, Grimmer and Bingham, 2013), and one way to monitor this is to track what are the brand experiences of consumers and how the aspect of eco-friendliness is manifested in these experiences.

6.1 Theoretical Contributions

The contribution of this research to high-tech product management research is that it demonstrates that the eco-friendliness dimension is an important aspect in the measurement of the entire brand experience of consumers, which has not been researched earlier. This dissertation also shows how this dimension is also applicable in the case of high-tech products, in addition to the four other dimensions included in the already existing brand experience measurement scale. In addition in this study, it has been tested with what items the eco-friendliness dimension can be measured, and it was shown that the four dimensions used for measuring brand experience can capture the eco-friendliness of a brand experience as well. The eco-friendliness dimension in the brand experience of high-tech products is a relevant dimension that has not been empirically tested on the brand experience level earlier.

In this study, an existing brand experience measurement (BBX) scale (Brakus et al. 2009) was replicated and further developed by including an eco-friendliness dimension in the scale. The further development of the BBX model was started by creating additional items on eco-friendliness based on the existing four dimensions in the BBX model. Two extended models were tested in this study: one that had the items on eco-friendliness included in the original four dimensions of the BBX model, and another

extended model where the items on eco-friendliness formed a separate dimension of eco-friendliness. The purpose of this study was to investigate with the extended BBX models whether consumers consider also eco-friendliness in the context of brand experiences, and is this aspect so strong in the minds of consumers that it would show up as a separate dimension in the BBX scale.

At first, the original BBX model was replicated successfully with three high-tech brands. This finding answered affirmatively the first research question on whether the original four-factor model can be replicated with a data set collected from Finland. Based on this finding it can be said that the original BBX model of Brakus *et al.* (2009) has been supported and the model can now be generalized more reliably as the external validity and construct validity of the original BBX scale have been verified by a replication (Armstrong, 2003, Hubbard and Lindsay, 2013b).

In addition, according to the findings of this research, the respondents considered eco-friendliness to be a dimension of high-tech brands outside the purchasing context and it is as strong a dimension as the other brand experience dimensions in the original BBX scale. This is the first study so far to add a dimension of eco-friendliness in the existing BBX scale. It was confirmed in the analysis of the two extended models that eco-friendliness is an additional dimension in the BBX model, and not included in the four brand experience dimensions of the original BBX model, which means that the second research question does not apply in this case. Instead the third research question was answered affirmatively, as the extended BBX model with the fifth dimension for eco-friendliness was proven to fit the data. This extended five-factor model yielded the best fit indices of all the three tested models, including the original BBX model, in the case of high-tech brands. Theoretically, this finding implies that brand experience is not only restricted to the four dimensions in the original BBX scale, but also the sustainability and environmental aspects are important, i.e. eco-friendliness is just as strong a dimension as the affective, behavioral, intellectual and sensory dimensions in the brand experience.

The eco-friendliness construct developed in this study includes the same four brand experience levels as the original brand experience model, as it has items measuring eco-friendliness on the affective, behavioral, intellectual and sensory levels. The proposed eco-friendliness dimension was based on the four dimensions that are used to measure the general brand experience at this stage, in order to verify whether the eco-friendly items are already included in the original BBX scale or whether they are a separate dimension. Also, supporting literature was presented for showing how the formulated items for the eco-friendliness construct with these four levels are actually the way how consumers also experience eco-friendly products, services, lifestyles and use product information in their decision making processes.

It should be noted, however, that based on the findings, the scores for the three high-tech brands on the eco-friendliness dimension were fairly low in this research. This result indicates that, even though people consider that the brand experience of high-tech products like mobile phones can have an eco-friendly dimension, they do not at the moment consider that any of the three major mobile phone brands are truly eco-friendly.

The measurement of environmental consciousness of consumers has not been theoretically grounded earlier (Diamantopoulos *et al.*, 2003), but this research offers some additional measures to the attested BBX scale. General environmental attitudes have been studied more than environmental attitudes in association with brand experiences. Diamantopoulos et al. (2003) state that hypotheses on green consumers have earlier been developed with the attempt of linking measures of environmental consciousness with socio-demographic variables but they may no longer be sufficient in the segmentation and profiling of green consumers, also the measures of general environmental consciousness deployed in the late 1990's have often been considered to be inadequately specified and assessed. There is a need for other ways of measuring consumers' views on eco-friendliness and their responses to the ESR communication and green marketing campaigns of companies. Orlitzky et al. (2011) also state that there is a need to develop more frameworks, measurement tools, and empirical methods to analyze and implement social responsibility and sustainability on the individual and group level, as the focus has so far been more on organizations.

6.2 Managerial Implications

The extended BBX scale with the eco-friendliness dimension can be useful for high-tech companies to follow up the way consumers experience brands in the constantly changing market place of the high-tech industry. Chintagunta et al. (2006) anticipate that structural models in marketing will in the future focus more on the relationship between economics and psychology, as structural models explain behavioral processes leading to improved prediction of possible market outcomes. They also propose that more interaction between economics, marketing, and psychology is required to update the theories of consumer behavior and processes (Chintagunta *et al.*, 2006). The extended framework developed in this research gives direct guidelines for measuring the impact of corporate actions in improving their positions in the competitive scene when considering brand management from the eco-friendliness point-of-view.

The findings of this dissertation also suggest some recommendations for managers on the relevance of including eco-friendliness in the brand experience measurements of high-tech brands as well. In addition, the results of this study can help companies to see the importance of conducting periodical brand experience measurements of their brands, especially in the case of new eco-innovative products or solutions, in order to see how this has helped to increase the eco-friendliness of the consumers' brand experiences. Also, the companies will understand that the inclusion of eco-friendliness as one aspect

of the brand needs to be planned and implemented already in the product development phase in order to be able to give an authentic impression and brand experience to the sceptic post-modern consumers (Firat and Venkatesh, 1995, Nicholls, 2010). This can then benefit the companies as green brand equity (Chen *et al.*, 2006, Chen, 2010), as well as add the green brand loyalty of the consumers to a specific brand (Kang and Hur, 2012).

The results of this study indicate that high-tech companies could be proactively looking into creating eco-friendly products and solutions as this dimension exists in the brand experience measurement scale. However, currently, based on the data collected for this study, the scores on this dimension are not very positive for high-tech brands, and this could also require in addition to designing and manufacturing more eco-friendly products also more elements of green marketing when advertising these products (Ottman, 2011) as well as providing truthful and easily understandable information on the eco-friendliness of the products (Moisander, 2007). A brand experience measurement scale including the eco-friendliness dimension is proposed, and it could be used to measure brands periodically to see how the scores for the dimensions improve in the minds of consumers over time.

6.3 Limitations of the Research

The proposition of this study is the first effort to comprehensively concept a dimension for eco-friendliness in the BBX scale and measure how consumers experience eco-friendliness as a part of an overall brand experience, and as such, it has its limitations. Thus, the extended BBX scale with the eco-friendliness dimension needs to be still replicated, further developed and tested with other data sets.

As this is a new area of research, there was limited possibility to refer to existing research literature which would have helped to create a more precise theoretical framework on which to build the extended BBX scale including the eco-friendliness dimension. Consequently, the theoretical background of this thesis is a mixed combination of theories mainly from consumer behavior research and marketing, as there is still very limited research and theories on measuring eco-friendliness in the context of brands or experiences. On the other hand, also the research of Brakus et al. (2009) was based on a wide spectrum of research areas starting from consumer and marketing research, and further covering philosophy, cognitive science and applied management. In this study, the items for the eco-friendliness construct were formulated on the basis of the existing BBX scale items which may not be the most optimal for describing eco-friendliness, even though in this study the factor loadings for the items proved to be well above the recommended values for factor loadings.

One of the delimitations that was decided in the beginning of this research was that only global brands would be examined and smaller local brands were consciously out-scoped

from this study. The reason for this is that there was a need to focus on some specific high-tech brands that are very familiar to most consumers due to their wide visibility. Another delimitation is that the research focuses only on one country specifically that has a high penetration of mobile phones, and it would still be beneficial to confirm that the results apply in some other countries and cultures (Netemeyer *et al.*, 1991). This in turn leads to one of the major limitations of this research which is that a single study with a data set from one country is not enough to support the proposition of the extended BBX with a fifth dimension for eco-friendliness. However, otherwise there are not that many limitations concerning the sample, as the respondents covered all age groups and were evenly distributed in the country. The sample size (N=506) was fairly large, and when the responses for the three brands included in this study were combined the sample size was tripled to over 1500, so the sample size effects are not statistically so relevant as in the case of small samples that have issues with reliability and factor structure.

The "Do not know" option could have been avoided by pre-testing more brands initially and then select only those brands that were familiar to the respondents, which would then have meant that the pre-tested sample and main sample would have had to be from a similar population. However, this was not done because in the scoping of this research it was decided that there would not be a lengthy pretesting phase. Even though the "Do not know" option offers a way to skip the pre-testing phase, the risk is that it may have created some noise in the measurement model. However, this was resolved by treating the “Do not know” answers as missing data. Also, it needs to be considered that if there would not have been the “Do not know” option, respondents could have selected some other option in cases where they did not truly know what to select, which could have in turn created some additional noise.

It also needs to be taken into account, that when a new parameter is added to a model that is tested with a fairly large sample, very often the factor loadings for this parameter are rather high just due to the fact that a new parameter has been added. However, this problem has been tackled in this study by examining different ways how the new parameters incorporated in the model, by also considering the possibility that the new parameter is embedded in the existing parameters of the original scale. With this approach, the results can be considered to be valid and supportive of the fifth new parameter for eco-friendliness in the BBX scale. If a new parameter added to an existing scale fits the data well it can often help to explain the data better, but this is not always necessarily automatically the case.

In addition, it may be considered to be a minor limitation that in the sample the majority of the respondents owned a Nokia/Lumia branded mobile phone which may have had some effect to the means and standard deviations in the responses, even though the factor loadings would not have been necessarily affected. The fact that Nokia is a Finnish brand may have an effect on the way the Finnish respondents have rated the

brand Nokia in this survey, so there clearly is the possibility that there is a so-called home country bias in the results. This phenomenon is due to affective brand processing which refers to the situation where local products are assessed more positively than imported products irrespective of the actual objective quality of the product (Riefler, 2012).

The number of brands included in this study was limited to three brands, from which two were the two current market share leaders (Apple and Samsung) while Nokia has lost market share considerably since then. However, at the time of the data collection for this study, the deal between Nokia and Microsoft had just only been announced, and the Nokia brand still had a rather strong position among consumers' minds, at least in the country where the data was collected. Now that the former Nokia Lumia branded phone (current Microsoft Windows phone) has lost market share considerably, it would be also important to include brands of some other phone brands that have lost market share, such as Blackberry by RIM and Motorola.

This study did not include any data on other brands than high-tech brands and therefore the original BBX model was only replicated for high-tech brands, which may also be considered to be a delimitation. There was a high correlation between the intellectual and sensory variables in all of the three tested models of this study in the case of high-tech brands. This study did not then further investigate the possibility of combining factors in the original BBX model to test if by reducing the number of factors to four, so that the sensory and intellectual factors would be combined, would have resulted in smaller correlations. In the original BBX model of Brakus et al. (2009) the correlation between the intellectual and sensory variables is not notably high. As this is a replication research, the high correlation between two variables is not yet considered to be an alarming issue, but this is an indication that more data would need to be collected and analyzed to do a deeper analysis of the correlations between the intellectual and sensory factors in the models. The highest correlation between the intellectual and sensory variables was in the case of the Nokia brand which may also be due to the home country bias partly that was already mentioned above.

There are also some demographic differences in the results, however, they have not been reported in detail in this thesis except when assessing the criterion validity of the measurement scale. The difference between men and women is statistically the most significant one, and there are some differences in the results according to the age groups of young and mature consumers, but these are not as significant. The educational background of the respondents has no statistical significance in how the respondents rate the eco-friendliness of high-tech brands.

6.4 Suggestions for Future Research

It remains for future research to verify if there are some special characteristics in the eco-friendly items and to look for other variations that could be better described by some other statements than the standard statements created on the basis of the BBX model. Also the theoretical background could be revised and upgraded to a more precise theoretical framework that could help to develop further the extended BBX scale with the eco-friendliness dimension. More exploratory research needs to be done in the future to answer the following questions: Is the perceived eco-friendliness a consequence of brand experience(s)? Is brand eco-friendliness relevant in the high-tech sector? And is brand eco-friendliness affected by ownership and Nokia being a local brand? As eco-friendliness is a dimension that applies to numerous product categories, not only high-tech products, the further development of the brand experience measurement scale would still require that more brands and product categories would be researched to come up with a better fitting model.

As for other suggestions for future research, more studies are needed to replicate the extended BBX measurement construct with multiple sets of data to verify if the five-factor BBX scale with an eco-friendliness dimension can be generalized (Madden *et al.*, 1995, Evanschitzky and Armstrong, 2013, Uncles and Kwok, 2013). It would be beneficial to study whether the results could be generalized to other product categories, and that they do not apply only in association with high-tech brands. As the data in this research consisted of three global brands, it would also be worthwhile to verify whether the conclusions are mainly relevant to global brands, or does the same apply for local brands.

There is a need to do cross-national research still to ensure the validity and reliability of the extended five-factor scale more widely. More data needs to be collected from other countries to make a contribution to international consumer research and compare the results across several countries to see whether the results are generalizable. As this study did not examine with detail the differences between consumer groups based on socio-demographics, it would still worthwhile to investigate what kind of socio-demographic differences there may be in the cultural context and compare different demographic groups in different countries. Due to the increasing globalization of business, marketing professionals have a permanent need for cross-national measures and constructs that are reliable, valid and can be applied in several countries to assist in the positioning and launching of products.

The high correlation between the intellectual and sensory variables in this study compared to the original BBX model would need to be examined more closely by analyzing more data. Also the items within these factors could be reviewed again to check if there are any overlaps. This is not a correlation that was specifically related to the eco-friendliness dimension that was added in this study, as it also appeared in Model

1 where only the original BBX items were included. This could also be a unique property for high-tech brands, which would need to be verified by comparing to data on other brands. The research of Brakus et al. (2009) also included such brands as, for example, Lego, Starbucks, Disney, Toys”R”Us, Ben & Jerry’s, L’Oreal, and Prada that have products and stimuli that can be highly appealing to the different senses in contrary to very technical brands where the main dimension on which consumers would experience the products and brands would be on the intellectual dimension. It may be that on the sensory dimension there are very small differences in the physical aspects of high-tech branded products as, for example, in the case of mobile phone brands included in the present study (e.g. they have a similar size, with a similar looking display) and even on the brand level they are associated more to cognitive technical solutions which are not necessarily highly appealing to the senses. In the case of high-tech brands, it could also be tested what the results would be like if the sensory variable was left out of the analysis.

In addition, to better understand consumer behavior and change it towards more sustainable consumption, research needs to focus more on analyzing how the publicization of companies’ ESR development activities could have a positive effect on the companies’ brands and increase consumers’ eco-friendly brand experiences. Could green marketing messages and branding stories, in addition to easily understandable and truthful product information, be used more to influence consumers, so that in the actual purchasing situation an eco-innovative high-tech product or brand is selected by the consumer? Following the thinking of Brakus et al. (2009), if the expectation is that experiences lead to pleasurable outcomes, it is also expected that consumers want to repeat these experiences, also in the case of positive eco-friendly brand experiences, the positive brand experiences with regard to eco-friendliness would be reflected in the eco-friendly product selections consumers make.

There is still a need to develop more frameworks, measurement tools, and empirical methods to analyze and implement ESR on the individual level (Orlitzky *et al.*, 2011). The brand experience scale with the extended environmental dimension could be tested with more high-tech brands and products to see how useful it is for the high-tech companies in tracking consumers’ perceptions of eco-friendliness in their brand experiences as a part of a wider brand experience in the constantly changing market place of the high-tech industry.

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ISBN 978-952-15-3670-0
ISSN 1459-2045