The Smart-Key to Consumers' Hearts and Wallets: How Smartphones Affect Consumer Product Customization

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The President:

Prof. Dr. Thomas Bieger

For my beloved parents,

Manuela and Ulrich

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Table of contents

Abstract

Consumers prefer different electronic devices for specific purposes. They use smartphones to communicate with friends and family or to listen to music on their way to work. They use desktop computers to write emails or build a presentation for their manager. In short, consumers prefer to use a certain electronic device type depending on the situation. Although prior research has already examined the usage behavior for electronic device types in various contexts, little theoretical knowledge exists regarding the effect of electronic device type usage on consumer product customization behavior. Moreover, prior research paid only minor attention to the questions of whether and to what extent regularly performed activities with the electronic device type affect consumers' perception of the electronic device type and the potential downstream consequences of that perception on their behavior. This research examines the effect of handheld electronic device types (smartphones) relative to stationary electronic device types (desktop computers) on consumers' willingness to pay (WTP) for a customized product and the final product feature composition of that customized product. Evidence from large-scale field and experimental studies demonstrates that the electronic device type (smartphone vs. desktop computer) significantly affects consumer product customization behavior. In particular, the use of a smartphone, relative to a desktop computer, alters consumers' WTP for a customized product and leads to a final product feature composition of a customized product that comprises more socially visible product features. The hypotheses underpinning these findings are that (I) hedonic value attribution to a smartphone (vs. a desktop computer) leads to a greater WTP for a customized product and (II) social value attribution to a smartphone (vs. a desktop computer) leads to a final product feature composition of a customized product that comprises more socially visible product features. The findings of this research provide meaningful implications for practitioners and researchers by advancing the understanding of the psychological mechanisms evoked by the usage of specific electronic device types.

Zusammenfassung

Konsumenten bevorzugen für unterschiedliche Zwecke verschiedene elektronische Geräte. Sie nutzen Smartphones, um mit Freunden und Familie zu kommunizieren oder auf dem Weg zur Arbeit Musik zu hören. Sie verwenden Desktop-Computer, um E-Mails zu schreiben oder Präsentationen für ihre Vorgesetzten vorzubereiten. Es wird deutlich, dass Konsumenten je nach Situation bestimmte elektronische Gerätetypen bevorzugen. Obwohl das Nutzungsverhalten in Bezug auf elektronische Gerätetypen in verschiedenen Kontexten bereits erforscht wurde, besteht nur wenig theoretisches Wissen darüber, wie sich die Verwendung von elektronischen Gerätetypen auf die Produktkonfigurationen der Konsumenten auswirkt. Darüber hinaus hat sich die Forschung bisher nur wenig mit den Fragen auseinandergesetzt, ob und inwieweit regelmäßig durchgeführte Tätigkeiten mit bestimmten elektronischen Gerätetypen die Wahrnehmung des elektronischen Gerätetyps selbst beeinflussen, und wie sich die potenziellen Konsequenzen dieser Wahrnehmung auf das Verhalten der Konsumenten auswirken. Dieses Forschungsprojekt befasst sich mit dem Verbraucherverhalten in Produktkonfiguratoren und untersucht, ob und in welchem Ausmaß tragbare elektronische Gerätetypen (Smartphones) im Vergleich zu stationären elektronischen Gerätetypen (Desktop-Computer) die Zahlungsbereitschaft sowie die Zusammensetzung der Produkteigenschaften beeinflussen. Ergebnisse aus groß angelegten Feld- und experimentellen Studien zeigen, dass elektronische Gerätetypen (Smartphone oder Desktop-Computer) die Konfiguration von Verbraucherprodukten erheblich beeinflussen. Insbesondere wirkt sich die Verwendung eines Smartphones auf die Zahlungsbereitschaft der Konsumenten in Bezug auf konfigurierte Produkte aus und führt schließlich zu einer Produktzusammensetzung mit mehr sozial sichtbaren Produkteigenschaften. Die diesen Ergebnissen zugrundeliegenden Hypothesen sind, (I) dass die hedonistische Wertzuschreibung zu einem Smartphone (vs. einem Desktop-Computer) zu einer höheren Zahlungsbereitschaft für ein konfiguriertes Produkt führt, und, (II) dass die soziale Wertzuschreibung zu einem Smartphone (vs. einem Desktop-Computer) eine Produkteigenschaftszusammensetzung mit einer höheren Konzentration an sozial sichtbaren Produkteigenschaften ergibt. Die Ergebnisse dieses Forschungsprojekts bieten bedeutsame Implikationen für Praktiker und Forscher, indem sie das Verständnis der psychologischen Mechanismen fördern, die durch die Verwendung bestimmter elektronischer Gerätetypen hervorgerufen werden.

List of Figures

List of Tables

List of Abbreviations

a.m.	Ante meridiem
APE	Associative and propositional processes in evaluation
CET	Central European Time
CI	Confidence interval
e.g.	Exempli gratia (for example)
etc.	Et cetera (and the rest)
et al.	Et alii (and others)
EUR	Euro
GPS	Global Positioning System
H	Hypothesis
ID	Unique identifier
i.e.	Id est (that is)
IoT	Internet of Things
IT	Information Technology
LAN	Local Area Network
M	Mean
M-commerce	Mobile Commerce
mHealth	Mobile health
N	Total sample size
N/A	Not applicable
NFC	Near field communication
p	Probability value
p.	Page
pp.	Pages
RAM	Random-Access Memory

SD	Standard deviation
SMS	Short Message Service
TAM	Technology acceptance model
TFSI	Turbo fuel stratified injection
U	Wilcoxon-Mann-Whitney test value
U.S.	United States
UK	United Kingdom
URL	Uniform resource locator
USD	US Dollar
vs.	Versus
WTP	Willingness to pay
α	Cronbach's alpha
ß	Unstandardized regression coefficient
%	Percentage

1 Introduction

1.1 Problem Orientation and Relevance

Product customization architectures allow consumers to create products according to their idiosyncratic preferences and needs, based on an entire range of provided product features (Franke, Schreier, and Kaiser 2010). Currently, companies across industries allow consumers to regularly customize a wide range of products, such as clothes, furniture, watches, personal computers, and cars (cyLEDGE Media 2017; Dewan, Jing, and Seidmann 2003; Franke and Piller 2004; Spaulding and Perry 2013), via web-based customization architectures through desktop computer interfaces (Dellaert and Stremersch 2005).

Product customizations present well-known advantages (Ansari and Mela 2003; Hvam, Mortensen, and Riis 2008; Piller, Moeslein, and Stotko 2004; Wind and Rangaswamy 2001) and are becoming increasingly relevant for consumers and companies. For example, a survey among 1,560 consumers showed that 36% expressed an interest in purchasing customized products or services and that 20% of these consumers even expressed a willingness to pay a 20% premium for them (Fenech and Perkins 2015). Currently, the field of consumer product customization is characterized by notable developments on technical prerequisites such as choice support in customizing a product (Hildebrand, Häubl, and Herrmann 2014) and complexity reduction of consumer product customization architectures (Dellaert and Stremersch 2005), as well as visual aesthetics of consumer product customization architectures (Tseng, Jiao, and Su 1997). However, consumer product customization is shifting from the established platform of desktop computers, which has been thoroughly addressed in prior research (Levav et al. 2010), to smartphones, as exemplified by recent usage statistics. In 2015, smartphones already overtook desktop computers as the primary point of access to the Internet (Zenith 2017). Another indication of smartphone prevalence is suggested by Criteo (2018), which states that smartphones' U.S. e-commerce share in 2017 was 67%, which was already higher than the share of desktop computers. Similarly, eMarketer (2018) reported that mobile sales totaled USD 1.36 trillion in 2017, which equaled 58.9% of global e-commerce sales.

Further, additional unique mobile functions arise, such as sharing personalized designs with friends, shaking the phone to add features to the product, implementation of geotags (i.e., content linked to a geographic location) via GPS (Tsirulnik 2017), building a three-dimensional model of a consumer's body (Simpson 2015), making payments in the store with a smartphone via near field communication (NFC), or product searches via voice recognition (Yadav and Pavlou 2014).

Despite these notable developments, current research on consumer behavior in customization environments does not yet reflect the rapid expansion of mobile electronic device types. Instead, prior work in this domain has examined mobile technology adoption (e.g., Ko, Kim, and Lee 2009; Sarker and Wells 2003) or actual physical design characteristics of the handheld electronic device type, such as screen size (Raptis et al. 2013). In addition to the previously outlined research, Xu et al. (2014) stated that even though smartphones "[…] have experienced rapid adoption among consumers, their effect on consumer behavior and their subsequent implications for publishers and advertisers have yet to be understood" (p. 97).

A combined consideration of the advantages of consumer product customization and the increasing relevance of smartphones in various spheres of consumer habitats leads the author to the question of how smartphones affect consumer decision-making in consumer product customization environments. To the best of the author's knowledge, surprisingly little is known about whether and to what extent electronic device types (smartphones vs. desktop computers) affect consumer decision-making in product customization environments.

1.2 Research Questions and Objectives

This work aims to contribute to existing consumer research by analyzing the effect of electronic device type usage (smartphone vs. desktop computer) on consumer decision-making in product customization environments. In particular, by referring to the broader field of consumer research in product customization environments (e.g., Franke and Piller 2004; Franke, Schreier, and Kaiser 2010; Hildebrand, Häubl, and Herrmann 2014; Norton, Mochon, and Ariely 2012), this research work examines the following: (I) consumers' WTP for a customized product and (II) final product feature composition, depending on

the used electronic device type (smartphone vs. desktop computer) in a product customization. More formally, the following research questions are addressed:

Research Question 1:

What are the differences in consumer product customization behavior (i.e., consumers' willingness to pay for a customized product, and final product feature composition), depending on the electronic device type (smartphone vs. desktop computer)?

Research Question 2:

Which factors can explain consumers' willingness to pay for a customized product and final product feature composition depending on the electronic device type (smartphone vs. desktop computer)?

Research Question 3:

How can firms actively affect consumer product customization behavior depending on the specific electronic device type (smartphone vs. desktop computer)?

1.3 Structure of the Dissertation

The remainder of the present research is organized as follows. First, the author reviews relevant literature. Second, the author derives the hypotheses on how the usage of smartphones vs. desktop computers affects consumer product customization behavior. Third, four studies provide evidence for the hypothesized effects. Fourth, a detailed discussion of the results is provided. Finally, the author discusses the main findings of the research work.

Chapter 1: Introduction

Problem orientation and formulation of research questions (pp. 1-4)

Chapter 2: Theoretical Background and Conceptual Framework

Review of relevant literature, establishment of conceptual framework, and formulation of hypotheses (pp. 5-54)

Chapter 3: Research Design, Methodology, and Results

Documentation and analysis of a large-scale field study and experimental studies (pp. 55-79)

Chapter 4: General Discussion

Discussion of the overall findings, implications, limitations, and avenues for future research (pp. 80-93)

Chapter 5: Conclusion

Concluding overview of the dissertation and its main findings (p. 94)

Figure 1-1. Structure of Dissertation.

2 Theoretical Background and Conceptual Framework

Intriguingly, to date little is known about consumer behavior in the context of smartphone usage for consumer product customization. This is surprising, given that smartphones have not only overtaken desktop computers in prevalence and usage (Zenith 2017) but are also assumed to affect companies' future revenue creation in computer-mediated environments (Naso 2017).

Building on this research gap, the current research aims to examine if and to what extent electronic device type usage (smartphone vs. desktop computer) affects consumer product customization behavior, namely (I) consumers' WTP for a customized product and (II) final product feature composition. Since smartphones and desktop computers differ in their contextual use, the author expects that both the hedonic value attribution and the social value attribution of the electronic device type determine consumer decision-making when customizing a product as will be argued next.

In what follows, the second chapter substantiates the theoretical foundation of this dissertation with the objective of creating its conceptual framework. By drawing on relevant literature from the fields of consumer product customization (section 2.1) and smartphones in consumer research (section 2.2), this chapter establishes a foundational understanding. Further, the subsequent sections illuminate the hedonic (section 2.3) and social (section 2.4) nature of smartphones, later resulting in the development of concrete research hypotheses which serve as the underpinnings for the empirical studies outlined in Chapter 3.

2.1 Theoretical Foundation of Consumer Product Customization

"Customers don't want choice; they just want exactly what they want."

Pine and Gilmore 1999, p. 76

This modest but striking statement by Pine and Gilmore (1999) sums up the underlying reason for the existence of consumer product customization in the first place: consumers'

inherent need for expression of their idiosyncratic preferences (see also Franke, Schreier, and Kaiser 2010; Schreier 2006). The purpose of this chapter is to offer an overview of the relevant literature in the field of consumer behavior in customization environments to provide a common understanding of the subject for this dissertation. In this section of the chapter, the author provides a comprehensive review of this stream of research. First, a definition of consumer product customization in consumer research is presented (section 2.1.1). Second, the reviewed literature is categorized according to notable characteristics of the concept of consumer product customization (i.e., preference fit, design effort, feelings of accomplishment, default options, and requirements) (sections 2.1.2 and 2.1.3). Finally, building on this categorization, a summary of important aspects of and gaps in the existing literature is provided and linked to the specific perspective of this dissertation.

2.1.1 Conceptual Foundation and Definition

In the broad field of consumer research, various definitions and terminologies for consumer product customization could be found, such as "mass customization" (e.g., Franke, Keinz, and Steger 2009), "customerization" (e.g., Wind and Rangaswamy 2001), "e-customization" (e.g., Ansari and Mela 2003), or merely product "customization" (e.g., Hildebrand, Häubl, and Herrmann 2014). Hence, the following section will contribute to a common understanding of consumer product customization as a concept.

In 1987, Davis was among the first to define the term "mass customization" in his book "Future Perfect". In this contribution, he pointed out that, even though technology was not sophisticated enough to help mass customization unfold its full potential, the phenomenon would prosper in the future. In particular, "mass customization" was described by him in later work as a strategic approach for producing personalized products and services (S. Davis 1989). Further, he concluded that "Mass customizing is more than an intriguing oxymoron. It's one of the most provocative new ideas in marketing and could instigate changes in the way companies organize and plan" (S. Davis 1989, p. 16).

Since the publication of these foundational works, technological advances in manufacturing procedures and information technology (IT) have taken place, and "mass customization" has evolved to become a relevant opportunity across multiple industries (Kotha 1995). Subsequently, consumers and companies greatly benefited from this development, as emphasized by Duray et al. (2000), who stated that the confluence of

these advances led to a substantial reduction in cost structures for customized products. This enabled consumers to reap the benefits of customized products at a reduced price and released untapped synergies for both actors (consumers and companies) (Duray et al. 2000). This proposition was in complete agreement with the work of Pine and Gilmore (1999), who defined consumer product customization as a "[…] response to a particular customer's desires" (Pine and Gilmore 1999, p. 76). This statement clearly presented an emphasis on producing a product from the consumer's perspective and was consistent with the work of Weill and Vitale (2001) who proposed a consumer centric definition by defining customization "[…] as products allowing design or tailoring to meet customer needs that are not satisfied by standard product offerings" (p. 296).

Consistent with this consumer centric view is the work of Wind and Rangaswamy (2001) on the differentiation between "customerization" and "mass customization". In their article "Customerization: The Next Revolution in Mass Customization," they proposed that the next stage of evolution of mass "customization" be called "customerization", fundamentally redefining and transforming marketing practice to match a consumer's perspective. Specifically, they used the exemplar of web-based car customization architectures to argue that the evolution of technology demonstrates the cause of this development. They further argued that even though both "customerization" and "mass customization" were designed to enhance the fit of products and services to consumers' needs, "mass customization" incorporates fewer functions and activities than does "customerization" (Wind and Rangaswamy 2001). According to them, another differentiation is the demand of IT resources needed to produce a product. While both "customerization" and "mass customization" are IT-intensive, "mass customization" is more demanding on the production side whereas "customerization" is demanding on the marketing side. Moreover, while "customerization" offers consumers more perceived control during the customization process relative to "mass customization", companies can actively influence decision-making by framing choice options (Wind and Rangaswamy 2001). A review of more recent literature (e.g., Hildebrand, Häubl, and Herrmann 2014; Levav et al. 2010; Norton, Mochon, and Ariely 2012) on this matter found that the term "customerization" as defined by Wind and Rangaswamy (2001) refers to the common prevailing term "product customization" used by many authors in this field of research.

Altogether, advances in production technology and IT laid the foundation for consumer product customization to prevail and demonstrate its importance to the broader field of consumer research by revealing commercial advantages for consumers and companies regarding customized products (i.e., low production costs and low prices).

Moving forward, the next section aims to investigate the characteristics of consumer product customization more closely. A more detailed analysis of beneficial consequences for consumers as well as the limitations of the concept of consumer product customization are discussed in section 2.1.2. Notably, the present section has only investigated the basic elements of consumer product customization and thus its delineation remains incomplete.

2.1.2 Characteristics

Prior work showed that three factors (i.e., preference fit, design effort, and feelings of accomplishment) are essential for companies to derive economic value from consumer product customizations (Franke, Schreier, and Kaiser 2010). Hence, this part of the dissertation discusses these factors to set the basis for a comprehensive understanding of the characteristics of consumer product customization.

2.1.2.1 Preference Fit of Customized Products

An extant body of literature has examined the benefits of increased preference fit of customized products, described by Franke, Schreier, and Kaiser (2010) as "[…] the customer's assessment of the extent to which the product's features correspond to her preference system" (p. 126) compared to such assessments of conventional, standard products. The literature has also demonstrated the tremendous potential of product customization as a driver for economic value creation (Dellaert and Stremersch 2005; Franke and Piller 2004; Ghosh, Dutta, and Stremersch 2006; Randall, Terwiesch, and Ulrich 2007; von Hippel 2001). Thus, customized products and services are more capable of meeting the individual needs and preferences of a consumer and therefore generate a greater consumer value relative to standardized products or services (Franke, Schreier, and Kaiser 2010; Roth, Woratschek, and Pastowski 2006). Moreover, prior research on the preference fit of customized products has shown that consumers "[…] may find learning their preferences about a product to be fun" (Huffman and Kahn 1998, p. 509) or that

consumers "enjoy" customizing a product that meets their preferences (Dellaert and Stremersch 2005, p. 226; see also Dabholkar and Bagozzi 2002).

In addition to the positively related outcomes of increased preference fit of customized products, evidence has been provided that a lack of fit between consumers' idiosyncratic preferences and product characteristics might cause negative outcomes such as high failure rates for new products (Schreier 2006; see also Cooper 2001).

However, from a company's perspective three focal, positively related outcomes regarding increased preference fit of customized products are present: greater WTP, higher consumer satisfaction, and greater purchase likelihood. First, various researchers have stated that consumers are willing to pay more for a self-customized product compared to a conventional standard product (e.g., Franke and Piller 2004; Franke, Schreier, and Kaiser 2010; Piller, Moeslein, and Stotko 2004; Randall, Terwiesch, and Ulrich 2007; Schreier 2006; Wind and Rangaswamy 2001). According to Randall, Terwiesch, and Ulrich (2007), implementing consumer product customization offers mutual benefits for companies and consumers. They further stated that one of these benefits includes the optimized match of consumers' preferences to the customized product, which in turn results in an increase of their willingness to pay for the product compared to a conventional standard product. Franke and Piller (2004) have underlined the importance of this phenomenon by demonstrating that consumers are willing to pay a price premium of up to 100% in the case of a self-customized watch due to an increased preference fit. Similarly, Schreier (2006) referred to Franke and Piller (2004) and claimed that this type of value increment is a more general phenomenon rather than just a singular occurrence. Further, Schreier (2006) provided further evidence of an increased WTP for various self-customized products (e.g., cell phone covers, T-shirts, and scarves). In particular, he not only referred to but also extended prior findings by Franke and Piller (2004), providing further explanations for the increment value attribution to customized products. Specifically, he noted, "[…] the functional benefit (better fit between individual needs and product characteristics), […] the perceived uniqueness of the self-designed product, […] the process benefit (meeting hedonic or experiential needs by 'doing it oneself'), […] the 'pride of authorship' effect (taking pride in having designed the product oneself)" (Schreier 2006, p. 325). These findings are consistent with the "I designed it myself"

(Franke, Schreier, and Kaiser 2010, p. 125) and "I made it myself" (Troye and Supphellen 2012, p. 33) effects, discussed later in section 2.1.2.3.

Similarly, Franke and Schreier (2010) further examined which factors cause this effect of increased WTP for customized products compared to a conventional standard product. In particular, they argued that perceived preference fit (i.e., "[…] customers' subjective evaluation of the extent to which the product's features correspond to their preference system" (p. 1021)), perceived process effort (i.e., "[…] subjective perception of the time and mental energy invested in designing the product" (p. 1021)), and process enjoyment (i.e., "[…] positive affective reaction elicited by the process of self-designing the product" (p. 1021)) impact the value attribution of the customized product. They argued that if consumers enjoy the process of customizing, they will ultimately value the final customized product more highly, subsequently resulting in an increased WTP (Franke and Schreier 2010). Notably, they provided evidence that this effect (i.e., consumers' enjoyment of the customization process leading to a higher WTP for the customized product) is independent of consumers' perceived preference fit. Moreover, they argued that specific actions such as customizing a product may satisfy consumers' need to feel competent and autonomous. The theoretical foundation of these observations was drawn from the self-determination theory, which indicates the extent to which consumers' choices are self-determined (Franke and Schreier 2010; see also Gagné and Deci 2005).

Second, despite the increased WTP for self-customized products relative to conventional standard products, previous work has also focused on consumers' satisfaction (e.g., satisfaction with the customization process) as a consequence of product customization (e.g., Hildebrand, Häubl, and Herrmann 2014; Huffman and Kahn 1998; Moreau, Bonney, and Herd 2011; Valenzuela, Dhar, and Zettelmeyer 2009). According to Huffman and Kahn (1998), consumers' perceived satisfaction with the customization process depends on the visual representation of information in the customization architecture as well as the type of information that consumers must provide during the customization process. In particular, they demonstrated that consumers' satisfaction with that process was increased if consumers had to indicate their preferences via an attribute-based information format (i.e., consumers stated their preferences for the individual attributes of the product) as opposed to an alternative-based format (i.e., consumers indicated their preferences for complete product feature compositions). To illustrate an attribute-based information

format, Huffman and Kahn (1998) highlighted the practical example of an IT hardware manufacturer (i.e., Dell Technologies Inc.). According to them, Dell enables consumers to customize their product (i.e., desktop computers) via a web-based customization architecture. Specifically, the company collects consumers' preferences for each attribute (e.g., size of the hard drive or amount of RAM) prior to presenting the final customized product to the consumer (Huffman and Kahn 1998). Conversely, in the alternative-based format consumers are provided with different options (i.e., complete product feature compositions) to choose from according to their individual preferences. They again offered a practical example of kitchen design shops to illustrate the discussed concept. More specifically, in this case, consumers walk through show rooms where various final customized kitchens are displayed. Hence, consumers can express their preferences among alternative options to the salesperson for evaluation, ultimately enabling them to choose a kitchen which matches their individual preferences (Huffman and Kahn 1998).

These practical examples showed that a modification of the customization process is not only feasible but also an effective mechanism to increase consumers' satisfaction and that companies should consider attribute-based information formats when planning to implement consumer product customization concepts. Notably, the underlying reason for the observed effects is that consumers tend to experience confusion or perplexity if too many options are offered (Huffman and Kahn 1998; see also Malhotra 1982). This argument is consistent with the findings of Hildebrand, Häubl, and Herrmann (2014), who discovered that a reduction in complexity of the customization process significantly increases consumers' satisfaction (see section 2.1.3 for a detailed discussion of this effect).

Third, previous research has provided evidence that implementation of consumer product customization leads to a greater purchase likelihood for self-customized products compared to conventional standard products (e.g., Valenzuela, Dhar, and Zettelmeyer 2009). For example, in their examination of travel insurance policy customization, Valenzuela, Dhar, and Zettelmeyer (2009) provided evidence that consumers' purchase likelihood was higher when they faced an attribute-based customization format compared to an alternative-based one. They noted that the underlying mechanisms for the observed effect are not only the reduction in choice difficulty but also the perception "[…] that trade-offs among competing characteristics are less explicit" (p. 762) and that "By-attribute self-customization reduces emotional trade-off difficulty because it frames choice

as a decision between each particular (quality) attribute level and price" (p. 762), whereas alternative-based formats force consumers to give up one attribute for another. Similarly, Franke, Keinz, and Steger (2009) noted that, among other benefits, purchase intention could be increased if products were customized on the basis of expressed preferences. Thus, Franke, Keinz, and Steger (2009) customized Internet versions of newspapers to perfectly match consumers' (representative sample of Austrian residents) preferences and compared responses to customized newspapers with those of conventional ones; they found that customization resulted in greater purchase intention relative to conventional newspapers.

Notably, Simonson (2005) took a different approach by examining the customization aspect from another perspective. Specifically, he suggested four factors directly influencing consumers' evaluation of offers (i.e., offers customized by the respective company) regarding purchase likelihood. First, Simonson (2005) noted that products differ on the basic dimension of price and quality (i.e., "[…] consumers who observe another consumer choose a high-price, high-quality option are more likely to select a high price, high-quality option, whereas observing another consumer choose a low-price, low-quality alternative often has little effect on purchase decision" (p. 38)). Second, another factor influencing purchase likelihood is the level of risk and return; Simonson (2005) found that "[…] in choices between low-risk, low-return and high-risk, high-return options, customers tend to choose the safe option by default" (p. 39). Third, he revealed that consumers make trade-offs in purchase decisions between luxuries (e.g., a unique wine) and necessities (e.g., basic food items). More specifically, Simonson (2005) claimed that a company's customized recommendations of luxury products would have a greater influence on consumers' final product choice than recommendations on necessity products. Fourth, whether consumers tend to accept or reject a customized product offer depends on the level of variety they seek. In particular, he describes two mechanisms "[…] (a) higher variety seeking decreases receptivity to customized offers, and this effect is more pronounced if variety seeking is driven by transient states and tastes, and (b) for infrequently purchased high-price items, the willingness to accept customized recommendations is positively correlated with the strength of independent evidence supporting the customized recommendation" (Simonson 2005, p. 39). Moreover, he referred to Iyengar and Lepper (2000) in his discussion of another idea about the influence of companies' product offerings on purchase likelihood as related to the number of options

that are offered. Despite the previously outlined effects on purchase likelihood, he noted that companies should consider the extent of the number of options that they offer, since too many options for consumers to choose from might result in a severe decrease in purchase likelihood (Simonson 2005).

2.1.2.2 Design Effort of the Customization Process

As previously addressed, research has investigated the question of how to optimize the customization process in terms of information volume or decision structure to decrease the efforts in customizing a product (i.e., reducing the cost/choice complexity of the customization process) and to improve defined targets (e.g., consumer satisfaction, WTP, or purchase likelihood) (Dellaert and Stremersch 2005; Hildebrand, Häubl, and Herrmann 2014; Huffman and Kahn 1998; Randall, Terwiesch, and Ulrich 2007; von Hippel 2001; Zipkin 2001).

Over the last decades, companies have increased their product offerings dramatically, and thus the amount of available product-related information has risen substantially, resulting in an increase in perceived choice complexity among consumers (Matzler, Stieger, and Füller 2011). In addition, Matzler, Stieger, and Füller (2011) asserted that shorter product lifecycles lead to continuous product releases, fueling consumers' confusion and resulting in consumers who cannot cope with this information overload in combination with rapid technological advances.

Some preliminary research on perceived choice complexity in the context of consumer product customizations was carried out in the early 2000s by Dellaert and Stremersch (2005) (see also Huffman and Kahn 1998; von Hippel 2001). Dellaert and Stremersch (2005) proposed four aspects by which perceived choice complexity from a consumer's perspective is affected during a customization process: the extent of mass customization, heterogeneity in available customization options for a customizable module, individual pricing of customizable modules within a customization, and the presence and level of a default version.

More specifically, Dellaert and Stremersch (2005) determined how these facets influence perceived choice complexity in the case of a customizable desktop computer. First, increasing the range of choice options of a consumer product customization architecture

with regard to the number of selectable modules (i.e., the working memory or processor of the desktop computer) and the number of customization options per module (i.e., the number of stages of processing speeds for a desktop computer's processor) increased the ability of consumers to customize their ideal product (Dellaert and Stremersch 2005). Despite this, Dellaert and Stremersch (2005) stated that a greater number of possible product feature compositions increased the perceived choice complexity because of an increase in the number of cognitive steps to be performed by the consumer. More specifically, Dellaert and Stremersch (2005) described the result of this dilemma as a trade-off: "On the one hand, such increases likely reduce the average distance between the mass-customized product that a consumer may compose and his or her ideal product, thereby increasing product utility. On the other hand, consumers must trade-off a greater number of possible module customization options. In turn, this increases the number of cognitive steps in the consumer decision-making process, which increases perceived complexity" (p. 220) (see also Bettman, Johnson, and Payne 1990).

Second, greater heterogeneity in the customization options that are available for a customizable module (i.e., large differences among selectable choice options, such as the option of a screen size of 13 inches compared to one of 20 inches) increases perceived choice complexity (Dellaert and Stremersch 2005). Third, according to Dellaert and Stremersch (2005), individual pricing of modules might influence perceived choice complexity. In particular, Dellaert and Stremersch (2005) stated that "[…] modules may be individually priced (e.g., the price of the different processors is shown) and shown along with the total product price, or they may be such that only the total product price is shown (e.g., the price of the different processors is not shown, but only the computer's total price is shown)" (p. 220). In turn, this might lead to an increase in cognitive effort for the consumer due to processing of multiple price points and could subsequently elevate the perceived choice complexity (Dellaert and Stremersch 2005). Fourth, Dellaert and Stremersch (2005) asserted that the presence and range of customization options for a default option (e.g., a preselected processing speed is displayed for the processor) decreases perceived choice complexity by presenting the consumer with a version of the product closer to his or her ideal version. Hence, the underlying reason for the observed effect is the reduction in cognitive process steps during a customization, given that the default option is in fact closer to the consumers' ideal product (Dellaert and Stremersch 2005). Remarkably, results have demonstrated that through the number of trade-offs

consumers must make during a customization process, choice complexity is significantly affected by the individual pricing of customizable modules within a customization process as well as the presence and range of customization options of a default version (Dellaert and Stremersch 2005).

These findings are consistent with those of Dellaert and Dabholkar (2009) who argued that by extending the range of customization options, the number of cognitive steps required to customize a product was increased which in turn led to an increase in perceived complexity. Hence, the benefits created (e.g., reducing the distance between the actual customized product and the ideal product) by offering consumers a greater set of choices carries the cost of increased complexity (Dellaert and Dabholkar 2009). They further stated that "Complexity is a cost associated with the mass customization process and refers to the consumer's perception of how complicated it is to use online mass customization" (Dellaert and Dabholkar 2009, p. 45). They also argued that the challenge of translating consumer needs to product specifications and addressing product uncertainty influenced perceived complexity. Nevertheless, both issues were partially mitigated by complementary online services such as visualization, salesperson interaction, or product adaptation because they afforded consumers "[…] a greater sense of control in using the on-line mass customization process" (Dellaert and Dabholkar 2009, p. 49). In particular, providing the aforementioned services might decrease perceived complexity (Dellaert and Dabholkar 2009). Moreover, in their consideration of product uncertainty, they compared the visual representation of the web-based customization architecture to consumers' interaction with a salesperson in a physical store. Both scenarios offered immediate feedback for the consumer (i.e., interactive visual examination of the product in the case of web-based customization architectures and verbal interaction between consumers and a salesperson in the case of store visits), subsequently lowering uncertainty (Dellaert and Dabholkar 2009). In turn, lowered uncertainty led to a reduction in perceived complexity as suggested by Simonson (1989). Therefore, providing additional information and offering the opportunity for salesperson interaction during the online customization process reduces perceived complexity and increases consumers' intentions for participation (Dellaert and Dabholkar 2009).

Further evidence for the dilemma of perceived complexity caused by an amplified variety of customization options in the context of consumer product customizations was provided

by Matzler, Stieger, and Füller (2011). They described the phenomenon as consumer confusion (i.e., a negative impact for the consumer) caused by a vast amount of information and choice in the course of the product customization process. Moreover, Matzler, Stieger, and Füller (2011), building on the early work of Mitchell, Walsh, and Yamin (2005) and Leek and Kun (2006), classified consumer confusion into three dimensions (i.e., similarity, overload, and unclarity) and provided evidence that consumer satisfaction with the product as well as the fun experienced during the customization process were negatively affected by it (i.e., consumer confusion). Specifically, similarity confusion was defined as "[…] a potential alternation of choice or an incorrect brand evaluation caused by the perceived similarity of products and services, e.g., colour, style, packaging, or lettering" (Matzler, Stieger, and Füller 2011, p. 233). The term overload confusion was described by Mitchell, Walsh, and Yamin (2005) as a "[…] lack of understanding caused by the consumer being confronted with an overly information-rich environment that cannot be processed in the time available to fully understand, and be confident in, the purchase environment" (p. 143). Finally, Matzler, Stieger, and Füller (2011) defined the entire phenomenon as unclarity confusion, indicating that consumers are confused due to poor quality of information (e.g., false product claims or incorrect interpretations). Further, product knowledge (i.e., knowledge which enables consumers to process information in an efficient manner, differentiate between important and unimportant information, and make well considered choices) and usability (i.e., rapid accessibility of information through use of hyperlinks and efficiency in resolving unclarity during the customization process) led to a decrease in consumer confusion (Matzler, Stieger, and Füller 2011).

In addition to the previous outlined drawbacks regarding perceived choice complexity in the context of consumer product customizations, Franke and Schreier (2010) argued that if a strenuous customization process leads to a negative perception, this in turn could bias the evaluation of the process outcome and finally influence consumers' WTP for the customized product. Hence, they built upon and confirmed early work in the field of emotions in the decision-making literature (e.g., Pham 1998), which stated that consumers rely on their feelings when evaluating a product (Franke and Schreier 2010). This is a vital finding since it provided evidence that perceived choice complexity might influence previously outlined positive benefits of consumer product customization (e.g., WTP for a customized product) discussed in section 2.1.2.1.

2.1.2.3 Feelings of Ownership and Accomplishment

As outlined in the previous sections, value attribution to the customized product is generated by the increased preference fit (i.e., the match between product characteristics and individual consumer preferences) and low design effort during the customization process. However, regardless of increased preference fit and low design effort, other, more subtle, psychological factors were observed in course of online customizations: namely, consumers' feelings of ownership and accomplishment. A growing body of literature has examined the phenomenon of raising the awareness of being the creator of the product design, which evokes feelings of pride and accomplishment in the consumer (Franke, Schreier, and Kaiser 2010; Troye and Supphellen 2012), resulting in a significantly higher WTP for a customized product (Franke, Schreier, and Kaiser 2010), and a positive influence on the evaluation of an outcome (Troye and Supphellen 2012).

In particular, this effect was defined in an article by Franke, Schreier, and Kaiser (2010) as "I designed it myself" (p. 125) or, similarly, as "I made it myself" in an article by Troye and Supphellen (2012, p. 33). Both articles stated that consumer product customization allows consumers to design products that correspond to their individual preferences. Specifically, Franke, Schreier, and Kaiser (2010) built upon fundamental research on the endowment effect, suggesting that "[…] the subjective value a person attributes to an object is contingent upon whether she owns the object or not: Goods that are included in one's endowment are valued more highly than identical goods not held in one's endowment" (p. 126; see also Kahneman, Knetsch, and Thaler 1990, 1991; Reb and Connolly 2007; Thaler 1980). Accordingly, Franke, Schreier, and Kaiser (2010) observed an increased economic value attribution for self-customized products due to underlying psychological mechanisms (i.e., psychological ownership). In other words, consumers are willing to spend more money (i.e., WTP) on self-customized products than on off-the-shelf goods. Although other researchers have investigated this relationship more closely, Belk (1988, p. 144) noted that "[…] we invest 'psychic energy' in an object to which we have directed our efforts, time, and attention. This energy and its products are regarded as a part of self because they have grown or emerged from the self" (see also Csikszentmihalyi and Rochberg-Halton 1981). Thus, raising consumers' positive feelings of accomplishment may result in an increased value attribution for the customized product (Franke, Schreier, and Kaiser 2010). Further, Franke, Schreier, and Kaiser (2010)

emphasized that "To capture the full value of MC [mass customization], toolkits should also elicit "I designed it myself" feelings" (p. 125).

Similarly, Troye and Supphellen (2012) emphasized that consumers' positive evaluation of the self-customized product is influenced by an active engagement in the product customization process. Troye and Supphellen (2012) further defined it as a "positive evaluation bias" (p. 33) due to "self-production" which leads to consumers' misinterpretation of their sensory perceptions. To illustrate this effect, Troye and Supphellen (2012) referred to the example of branded kits to produce an outcome such as preparing a soup using the Knorr brand or assembling an IKEA chair. Further, they drew three distinctions between studies of consumer self-design by various authors (e.g., Dahl and Moreau 2007; Franke, Keinz, and Schreier 2008; Franke, Schreier, and Kaiser 2010) and the "self-production" effect (Troye and Supphellen 2012). First, whereas research on self-design has assumed that the consumer is involved prior to the customization process, "self-production" examined consumers' usage of prefabricated branded items to customize a product.

Second, according to Troye and Supphellen (2012), another distinction between the two effects (i.e., self-production vs. self-design) is consumers and manufacturers' relative control over the outcome (i.e., the final customized product). In the specific case of self-design studies, the marketer can determine the granted level of control over the visual outcome (e.g., a visual pattern) through constraining the amount of possible customization options as well as adjusting the product if the final customized product does not seem feasible (Troye and Supphellen 2012). Conversely, Troye and Supphellen (2012) also investigated the case of self-production and showed that in fact the marketer has less control than the consumer since the marketer can only influence what the consumer does but not on how the consumer does it.

Third, Troye and Supphellen (2012) asserted that "self-production" involves consumers in physical interaction with the items used for the product customization. Thereby, they built upon fundamental research on haptic cues by Krishna and Morrin (2008), stating that these cues might influence consumers' perceptions and evaluations of the final customized product (Troye and Supphellen 2012).

Further, Troye and Supphellen (2012) explained the theoretical implication of the self-production effect (i.e., consumers' usage of prefabricated branded items to customize a product) by drawing on the work of Gawronski and Bodenhausen (2006); they stated that Gawronski and Bodenhausen's associative and propositional processes in evaluation (APE) model illustrates the ideal foundation to explain the underlying psychological processes behind the designated effect (Troye and Supphellen 2012). Specifically, Troye and Supphellen (2012) stated that the APE model is a two-appraisal model "[…] in which evaluations are conceptualized as the outcome of two distinct but partly interdependent processes. Gawronski and Bodenhausen's version labels the two types of processes as 'associative' and 'propositional.' Associative processes produce appraisals that are intuitive, instant, automatic, and affective reactions and are activated automatically when a person encounters a relevant stimulus […] Propositional processes are of a more cognitive, deliberate nature and transform affective reactions into explicit propositional appraisals that are assessed for their validity" (p. 35) (see also Gawronski and Bodenhausen 2006). Hence, Troye and Supphellen (2012) suggested that the previously outlined processes (i.e., associative and propositional) and the interaction between them might elucidate consumers' evaluation of self-customized products.

In conclusion, both the effects of, "I designed it myself" noted by Franke, Schreier, and Kaiser (2010) and "I made it myself" described by Troye and Supphellen (2012) demonstrate how consumers' emotional perception is altered by enabling them to create products which correspond to their idiosyncratic preferences.

2.1.3 Default Options and Requirements

In the previous sections, the author elucidated the benefits (e.g., higher WTP for a customized product) and drawbacks or costs (e.g., increased choice complexity) of consumer product customization architectures. Although the benefits seem to outweigh the drawbacks, there are still some uncertainties left regarding whether an implementation of consumer product customization architecture always must be a trade-off decision and hence if an implementation is reasonable from both the consumer's and company's perspective.

In their article "Product Customization via Starting Solutions," Hildebrand, Häubl, and Herrmann (2014) referred to this dilemma as the "customization paradox" (p. 708). They

presented a remedy to overcome at least one major drawback, perceived choice complexity, by implementing default options into the customization process. In particular, to make "[…] the process less onerous for consumers" (p. 707), they introduced the novel customization via starting solutions architecture, which decreases consumers' perceived choice complexity in the decision-making process without sacrificing the benefits of consumer product customizations (e.g., low cost structure or increased WTP), while also offering consumers the same flexibility regarding attribute range as standard attribute-by-attribute consumer product customization architectures (i.e., consumers choose each attribute individually) (Hildebrand, Häubl, and Herrmann 2014). Thereby, the authors suggested that consumers choose a solution at the beginning which they subsequently modify during the customization process to match their individual preferences (Hildebrand, Häubl, and Herrmann 2014). Further, they built upon the fundamental literature on problem solving, arguing that dividing a complex task into multiple simpler ones ultimately reduces perceived complexity of the overall task (see also Lau, Yam, and Tang 2011; von Hippel 1994).

Despite the reduction in perceived choice complexity, this approach yields further benefits for consumers in comparison to standard attribute-by-attribute consumer product customization architectures, including increased satisfaction with product choices and enhanced mental simulation of product use (Hildebrand, Häubl, and Herrmann 2014). According to the authors, apart from increased consumer satisfaction, firms greatly benefit from default options by selling more feature-rich products to consumers; this provides an increase in revenue without changing other factors such as product assortment, pricing, or any other marketing variable. Brown and Krishna (2004) similarly stated that almost every consumer has experienced default options during a shopping process. Brown and Krishna (2004) further defined a default option as "[…] the choice alternative a consumer receives if he/she does not explicitly specify otherwise" (p. 529) and argued that these default options take advantage of consumers' processing limitations and ultimately influence choice behavior.

2.1.3.1 Requirements and Cost of Implementation

Although default options decrease choice complexity, Zipkin (2001) highlighted four requirements which constitute potential boundaries of consumer product customization

architectures. First, a highly flexible production technology must be in place (Zipkin 2001). He elaborated on highly flexible production technology by discussing notable aspects which should be considered in this regard such as development cost of technologies or the ability to digitalize processes (e.g., information processing, printing, and cutting metal rods and tubes) (Zipkin 2001).

Second, a sophisticated mechanism for examining consumers' wants and needs is required (Zipkin 2001). According to him, acquiring unique information about the consumer is the key driver to shaping a unique customization experience. Therefore, it is of utmost importance to ask consumers the right questions and to establish accurate measurements (Zipkin 2001).

Third, a robust direct-to-consumer logistics system is a prerequisite (Zipkin 2001). The author compared "mass customization" with "e-commerce", stating that in many cases both lack sufficient logistics processes. Specifically, Zipkin (2001) asserted that "Upon emerging from the high-volume production process, each individual product must be sent to the right person. Such direct-to-customer distribution is quite different from the conventional kind, and switching from one to the other has proved difficult" (Zipkin 2001, p. 84). In 2001, the IT underlying logistics processes (i.e., the Internet, automated warehouses, and package-delivery services) were not yet fully developed (Zipkin 2001).

Fourth, Zipkin (2001) noted that consumers are not willing to pay for customized products in all product categories. More specifically, the author suggested that companies should always estimate the potential for customized products by determining consumers' demand for variety in product attributes. To conclude, Zipkin (2001) proposed that companies should carefully analyze their ability to fulfill the aforementioned requirements for successfully integrating consumer product customization architectures.

Similarly, Piller, Moeslein, and Stotko (2004) further emphasized that companies should be aware of the costs involved in the development and implementation of consumer product customization architectures in the fields of sales and consumer interaction as well as manufacturing. Further, the authors stated that in addition to investing in consumer product customization architectures and other IT, it would be beneficial for companies to create mechanisms to limit the burdens of product customization on the consumer (Piller, Moeslein, and Stotko 2004). According to them, additional costs may include investments

in customer service centers, highly qualified staff, trust-building promotional activities, and an increase in distribution costs due to smaller shipment size (Piller, Moeslein, and Stotko 2004). Further, they asserted that in the field of manufacturing, a loss of economies of scale might occur relative to mass manufacturing and cost level might be amplified. They stated in greater detail that "Higher set-up costs, costs for better qualified labour, an increased complexity in production planning and control, and more complex and detailed quality control are escalating the cost level" (Piller, Moeslein, and Stotko 2004, p. 438). Conversely, Franke, Schreier, and Kaiser (2010) argued that the adoption of a consumer product customization architecture is economically feasible only if the company is able to realize a price premium for the customized products or if it is possible to increase the number of units sold to cover the cost incurred in conjunction with the adoption (see also Ansari and Mela 2003; Kramer 2007).

2.1.4 Summary

A considerable amount of literature has been published on consumer behavior in customization environments. These studies investigated characteristics of consumer product customization architectures (i.e., preference fit of customized products, design effort in the customization process, and feelings of ownership and accomplishment) as well as instruments to optimize the customization process (i.e., the implementation of default options). As previously discussed, various authors have argued that requirements (e.g., highly flexible production technology or a robust direct-to-consumer logistics system) and the subsequent cost of implementing a consumer product customization architecture are notable aspects to consider further.

Although the existing literature provides valuable insights into the beneficial outcomes as well as potential obstacles of consumer product customization, the influence of the electronic device type used to customize a product on decisions during the customization process has not yet been fully explored. The present work addresses this gap by exploring the impact of electronic device type usage (smartphone vs. desktop computer) on consumer product customizations. In particular, the author proposes that electronic device type characteristics and their respective usage patterns influence consumers' decision-making processes during a product customization. Subsequently, specific research hypotheses will be outlined in sections 2.3 and 2.4. Research on consumer product

customization and practitioners should thus benefit from the results provided in this dissertation, which should help to achieve a better understanding of the psychological mechanisms underlying the decisions made by consumers during a customization process. Specifically, the present research contributes to a more detailed understanding of consumer product customization behavior regarding the usage of specific electronic device types (i.e., smartphone vs. desktop computer). Hence, this advanced understanding of consumers' customization behavior could support future research attempts to explore new avenues of consumer product customization architectures (e.g., the optimization of the customization process).

2.2 Theoretical Foundation of Smartphones in Consumer Research

"The Internet and other information-processing technologies allow sellers to better understand each customer's needs and wants, facilitating market provision of customized consumer goods."

Dewan, Jing, and Seidmann 2003, p. 1066

The above statement from Dewan, Jing, and Seidmann (2003) demonstrates that the technology component is fundamental to the evolution of consumer product customization throughout the 21st century. Hence, to explore the full potential of consumer product customization it is important to highlight the role of input modalities of electronic device types (i.e., desktop computers use indirect input modalities such as a computer mouse or keyboard and smartphones use direct input modalities such as touch screens) in this regard. Chapter 1 of this dissertation demonstrated the evident rise of smartphones as a prominent device type among other electronic device types such as tablets or desktop computers (e.g., Criteo 2018; Zenith 2017) and among other digital technologies (e.g., the Internet of Things (IoT), artificial intelligence, and deep learning). Uniquely, smartphones "[…] promise significant transformations of consumers' lives in the near future" (Kannan and Li 2017, p. 22). Thus, this discussion will focus on smartphones in the context of consumers' decision-making processes. In the discussion that follows, the author provides a review of previous research regarding smartphones in the broad field of consumer

research to form a common understanding of the subject. First, the technological characteristics of smartphones relative to desktop computers are discussed (section 2.2.1) to highlight the unique character of the electronic device type (i.e., the smartphone). Second, the broader field of mobile marketing is discussed. Specifically, after establishing a conceptual foundation along with a formal definition of mobile marketing, influential environmental factors (i.e., the physical location of the consumer and point in time) regarding promotional targeting are discussed (section 2.2.3). Third, to underline the business impact of mobile marketing, the author examines how mobile commerce can contribute to a company's long-term success if correctly implemented into an overall strategy (section 2.2.4). Finally, observed research gaps in the existing literature are presented together with their practicable implications for this dissertation.

2.2.1 Characteristics of Smartphones

Mobile phone technology has significantly developed since a truck driver in St. Louis (U.S.) placed the first telephone call via a mobile phone in June 1946 (Balasubramanian, Peterson, and Jarvenpaa 2002). According to Balasubramanian, Peterson, and Jarvenpaa (2002), at that time mobile phones were heavy (i.e., weighing about 80 pounds) and expensive to use (i.e., the monthly fee was USD 15 plus a surcharge of 30 cents per call), compared to smartphones nowadays. In addition, early mobile phone models were not technologically comparable with today's smartphones (Balasubramanian, Peterson, and Jarvenpaa 2002). However, Balasubramanian, Peterson, and Jarvenpaa (2002) stated that because of technological advancements such as wireless local area networks (LANs) and GPS technology (e.g., Shugan 2004) and the wide adoption of smartphones (e.g., Lamberton and Stephen 2016; Xu et al. 2014), this electronic device type became a powerful gadget for marketers.

According to Larivière et al. (2013) the ubiquitousness of smartphones in our everyday life cannot be repudiated.[1] Further, they stated that smartphones have five unique characteristics (i.e., portable, personal, networked, textual/visual, and convergence elements), which in combination lead to multiple beneficial outcomes for consumers and

[1] Larivière et al. (2013) refer to mobile devices in their article which explicitly includes smartphones.

companies, such as enhanced interaction and communication or new means of value creation (Larivière et al. 2013). These are outlined in greater detail below.

First, one key characteristic of a smartphone is its portability (i.e., consumers can carry and use it everywhere) which naturally depends on the size and weight of the electronic device type (Larivière et al. 2013). Similarly, Balasubramanian, Peterson, and Jarvenpaa (2002) affirmed this argument by describing portability as one key benefit of mobile devices over desktop computers. Larivière et al. (2013) concluded that, among mobile device types (i.e., tablets, smartphones, and laptops), smartphones have the highest portability. In addition, Shankar and Balasubramanian (2009) emphasized that mobile device types are not only portable but could also be described as a "[…] constant companion to the user […]" (p. 119), hence enabling companies to instantly communicate with the consumer at any point in time (Shankar and Balasubramanian 2009).

Second, smartphones are perceived as personal devices since a vast amount of personal data is stored on the device (Shankar and Balasubramanian 2009). In addition, Shankar and Balasubramanian (2009) described how consumers tend to customize their device with cases or skins (showing individualism) and adjust the variety of applications stored on the device to their individual needs. According to Larivière et al. (2013), in rare cases consumers even give their smartphone a name to express the personal relationship they have with the device. They further argued that marketers have introduced the term "companion device" to refer to the intimate relationship between consumer and device (Larivière et al. 2013). This is consistent with the findings of Danaher et al. (2015), who described smartphones as a "highly personal medium" (p. 711) (see also Bacile, Ye, and Swilley 2014; Goh, Chu, and Wu 2015). Moreover, Shankar et al. (2010) extended that notion by stating that smartphones have a personal nature and that this distinguishes them fundamentally from other electronic devices such as desktop computers. In addition, smartphones are cultural objects, while desktop computers are perceived as functional gadgets (Wang, Malthouse, and Krishnamurthi 2015). Hence, Wang, Malthouse, and Krishnamurthi (2015) asserted that companies have the opportunity to build personal relationships with consumers through smartphones across both temporal and spatial dimensions (see also sections 2.2.1 and 2.2.2).

Third, Larivière et al. (2013) further delineated smartphones' connectivity to the Internet as one of their most important characteristics since it enables them to have quick access to

a vast amount of information. In particular, consumers are able to compare prices or offers of competitors during their in-store shopping process or merely share shopping process-related experiences via social media (Larivière et al. 2013). Moreover, they stated that "Being networked inherently implies anytime, anywhere, but also just-in-time (when there is a need to produce or consume) and in real time (without any delays)" (Larivière et al. 2013, p. 272). In a similar vein, Shankar et al. (2010, p. 119) promoted the term of "anytime, anywhere mobile devices" to illustrate the uniqueness of this electronic device type (see also Okazaki and Mendez 2013). Notably, smartphones are purely wireless and do not depend on any physical connection to a server whereas desktop computers need a wired connection to function properly (Shankar and Balasubramanian 2009). Hence, the aspect of connectivity offers marketing-related opportunities for companies to approach consumers (Shankar and Balasubramanian 2009).

Fourth, unlike to traditional telephones which only provide acoustic exchange, smartphones allow consumers to use textual and visual content for communication with peers or access relevant visual information during the shopping process (Larivière et al. 2013). One interesting example of using smartphones in the context of offline shopping is that consumers share pictures of themselves using a product or service in the shop (i.e., offline) and then asking their peers to vote on it before the product is even purchased (Larivière et al. 2013). Fifth, according to Larivière et al. (2013), the convergence of technologies enables consumers to use different functions (e.g., phone calls, emails, maps, videos, or shopping) with one device. Thus, consumers do not have to purchase various types equipment which is clearly a cost benefit for them and also allows companies to establish multichannel relationships with consumers (Larivière et al. 2013). In summary, according to Larivière et al. (2013) the array of discussed characteristics (i.e., portable, personal, networked, textual/visual and convergence) provided an indication of smartphones' uniqueness and elucidate the benefits for both consumers and companies.

In contrast to the aforementioned beneficial characteristics of smartphones, there is one missing technical aspect that could be interpreted as a disadvantage when compared to other electronic device types (i.e., desktop computers); smartphones have a relatively small screen size (Wang, Malthouse, and Krishnamurthi 2015; see also Shugan 2004). Ghose, Goldfarb, and Han (2012) provided evidence that smartphones increase consumers' search costs because of the small screen size of the smartphone compared to

desktop computer monitors. In addition, according to Ghose, Goldfarb, and Han (2012), click-through rates for smartphones increased by 37% if a post moved upwards on a website relative to desktop computers, which increased by 25%. Moreover, behavioral data from a microblogging[2] service similar to Twitter (i.e., users write short posts to express their thoughts) was analyzed regarding ranking effects of posts (i.e., the rank of the position of each post on the screen) and the results showed higher ranking effects for smartphones (relative to desktop computers) which in turn indicated higher search cost (i.e., consumers using a smartphone are more likely to select certain informational content if it is displayed at the top of the screen) (Ghose, Goldfarb, and Han 2012). According to Ghose, Goldfarb, and Han (2012), the underlying reason for the observed ranking effects was that consumers experienced greater cognitive effort due to having to scroll down a long list of displayed information on a small screen. Thus, Ghose, Goldfarb, and Han (2012) drew on the literature on ranking effects in online environments, which suggests that consumers using a desktop computer tend to choose website links to specific web content that are ranked higher (e.g., Ansari and Mela 2003; Drèze and Zufryden 2004). Further, these ranking effects are crucial from a managerial perspective since they fundamentally influence the strategy of a company, in particular its mobile marketing strategy (Ghose, Goldfarb, and Han 2012).

Raptis et al. (2013) similarly suggested that smartphone screen size has a significant effect on consumers' efficiency in terms of information seeking exercises. According to them, consumers who used a smartphone with a larger screen to complete an information seeking task performed it more efficiently (i.e., finding specific information on the Internet) than did consumers who used a smartphone with a small screen. In addition, they proposed that the observed effect of screen size on efficiency strongly depends on the kind of task which is performed by the consumer. Thus, if the consumer faces a task with low cognitive interaction (e.g., scrolling on the screen), they benefit from a larger screen size (Raptis et al. 2013). Conversely, Sohn, Seegebarth, and Moritz (2017) provided evidence that a larger screen size for the electronic device type is not always beneficial for consumers. Specifically, consumers negatively perceived visual complexity, due to richer modes of

[2] "A microblog differs from a traditional blog in that its content is typically much smaller in size, consisting of a short sentence or fragment described within a limit of 140 characters. The central feature of microblogging is a stream of messages (i.e., tweets) that a user receives from those he or she follows" (Ghose, Goldfarb, and Han 2012, p. 2).

presentation (e.g., animated pictures or videos) in mobile online shops. This influenced consumers' perceived satisfaction with the shopping experience regardless of the screen size of the device type that was used during the shopping process (Sohn, Seegebarth, and Moritz 2017). Conversely, "Using content that is developed for large screens does not usually cause any problems with small screens, where in the opposite situation, problems or difficulties are more likely to arise" (Güler, Kılıç, and Çavuş 2014, p. 129).

Research in the emerging field of human-computer interaction in marketing has only partially investigated the importance of the medium (i.e., electronic device type) which is used to access online content and how the medium affects consumers' perception of the content while experiencing a website. However, one of the first investigations into the effects of electronic device types' input modalities (i.e., touch vs. non-touch) on consumer behavior was conducted by Brasel and Gips (2014). Their seminal paper, "Tablets, Touchscreens, and Touchpads: How Varying Touch Interfaces Trigger Psychological Ownership and Endowment," drew on an extensive range of preliminary work in the area of touch and consumer behavior (e.g., Jansson-Boyd 2011; Krishna 2012; Peck and Childers 2003; Peck and Shu 2009). Brasel and Gips (2014) highlighted the shift in electronic device type usage from desktop computers to mobile devices, which implies a shift from indirect (i.e., computer mice) to direct (i.e., touchscreens) input modalities. Hence, the results indicate that these changes influence the online experience of consumers. More specifically, according to Brasel and Gips (2014), touching the representation of a product via a direct input modality (i.e., touch screen) generated stronger levels of endowment (i.e., "The endowment effect causes consumers to overvalue items they perceive they own […]" (p. 227)) and created stronger psychological ownership (i.e., "[…] a consistent mediator of product valuation […]" (p. 227)) compared to an indirect input modality (i.e., a computer mouse).

In a similar vein, Krishna (2012) drew on ancient Greek philosopher Aristotle to emphasize the meaning of touch for humans by stating that "Per Aristotle, touch provided a true picture of the intrinsic nature of the object, so that the soft coat of a kitten would be indicative of its innate softness of character. Also, touch and the cosmos were connected since sexual stimulation worked through the sense of touch allowing the human race to continue" (p. 335).

Recent evidence from research by Shen, Zhang, and Krishna (2016) further supported the notion of differences in usage behavior among consumers when using different electronic device types (i.e., input modalities of touch vs. non-touch). In particular, Shen, Zhang, and Krishna (2016) suggested that usage of touch relative to non-touch input modalities promotes consumers' choice of "[…] an affect-laden alternative over a cognitively superior one […]" (p. 745); they called the observed effect the "direct-touch effect". According to them, the discovered effect is driven by greater mental simulation from the actual interaction with the product via a touch screen as an input modality. Notably, the effect provided consistent results across multiple product categories (Shen, Zhang, and Krishna 2016). Specifically, this particular "direct-touch effect" was observed when consumers who used an electronic device type with a touch input modality (relative to a non-touch one) chose a chocolate cake (i.e., an affect-laden alternative) over a fruit salad (i.e., an item that is cognitively superior) (Shen, Zhang, and Krishna 2016). They stated that mental simulation of the actual product interaction is the main reason (i.e., the mediator) for the observed "direct-touch effect". However, Shen, Zhang, and Krishna (2016) proposed two alternative explanations for the "direct-touch effect".

First, drawing on Shiv and Fedorikhin (1999), they argued that if consumers are able to touch a product (i.e., indirectly through a screen) it could be perceived as a natural habit that leads to an automatic mode, as opposed to just clicking a mouse, which is less natural. Hence, consumers are more likely to choose the affective alternative when touching the product via a screen than when clicking on the product using a mouse (Shen, Zhang, and Krishna 2016).

Second, they argued that certain electronic device types (i.e., tablets or desktop computers) are used for specific purposes (i.e., fun activities or work-related tasks). More specifically, Shen, Zhang, and Krishna (2016) proposed that tablets (i.e., a touch input modality) are used for fun activities whereas desktop computers (i.e., non-touch input modality) are instead used for work-related tasks. Thus, according to Shen, Zhang, and Krishna (2016), consumers using an electronic device type with a touch input modality (vs. a non-touch input modality) are more likely to choose the affective product option due to an enjoyment goal which was activated by touching the representation of the product on the screen. However, the usage of touch vs. non-touch input modalities could also lead to negative outcomes. According to Kim et al. (2012) typing productivity was lower and discomfort

higher for consumers who used an electronic device type with a touchscreen as an input modality than for consumers who used an electronic device type with a conventional keyboard as an input modality.

In a similar vein, Hildebrand, Levav, and Herrmann (2015) contributed to the research field of human-computer interaction in marketing by providing evidence that changes in input modalities (i.e., touch vs. non-touch) of electronic device types affect consumers' spending behavior and their perceived shopping experience. More specifically, results showed that in the context of consumer product customizations, consumers' usage of electronic device types with touch as an input modality caused a more experiential perception (relative to an instrumental one) of the shopping experience than did usage of non-touch devices (Hildebrand, Levav, and Herrmann 2015). Thus, the downstream consequence of this effect is that consumers chose more hedonic product features relative to utilitarian ones which in turn resulted in a higher monetary value of the final customized products (Hildebrand, Levav, and Herrmann 2015).

2.2.2 Mobile Marketing

2.2.2.1 Conceptual Foundation and Definition

As previously described in the introduction to the current work, the usage of smartphones compared to desktop computers has increased rapidly in recent years (e.g., Criteo 2018; Zenith 2017). Hence, it could be assumed that the relevance of smartphones for marketers is increasing similarly due to the rising number of consumers using a smartphone for consumption purposes such as mobile commerce (m-commerce) (Shankar et al. 2010). A comprehensive overview of representative literature in the field of mobile advertising has been provided by Grewal et al. (2016), drawing on and synthesizing substantial work by various authors (e.g., Andrews et al. 2015; Danaher et al. 2015; Fong, Fang, and Luo 2015; Hui et al. 2013a; Luo et al. 2014; Shankar et al. 2016). Grewal et al. (2016) concluded that regardless of the industry, nearly every company faces a multitude of factors (e.g., environmental contexts, technological contexts, consumer-related factors, the role of advertising goals and elements, and market-related factors) that will substantially affect companies' mobile advertising and marketing-related strategies in the future. Importantly, Grewal et al. (2016) asserted that consumers' access to information anytime and anywhere (see also Larivière et al. 2013; Shankar et al. 2010) due to the characteristics of

smartphones, enables companies to approach consumers more effectively (i.e., directly and constantly). Similarly, Peters, Amato, and Hollenbeck (2007) emphasized the importance of smartphones as ideal advertising tools due to their ubiquitous nature, further underlining the relevance of smartphones in marketing. Wang, Malthouse, and Krishnamurthi (2015) supported this notion by stating that "Interacting with customers via their mobile devices is a desirable marketing approach because providing a mobile app or website does not require buying media, unlike traditional advertising or retailing" (p. 218). Despite the positively related aspects of mobile advertising, companies should be aware that not every product type is well-suited for mobile advertising campaigns through display ads[3] (Bart, Stephen, and Sarvary 2014).

In order to define mobile marketing, this dissertation draws on a definition provided by the Mobile Marketing Association (2008). This association formally defined mobile marketing relatively broadly as "[…] the use of wireless media as an integrated content delivery and direct response vehicle within a cross media or stand-alone marketing communications program" (Mobile Marketing Association 2008, p. 22). Some preliminary work in the field of mobile marketing was carried out by Shankar and Balasubramanian (2009) who provide a more exhaustive delineation, defining mobile marketing as "[…] the two- or multi-way communication and promotion of an offer between a firm and its customers using a mobile medium, device, or technology" (p. 118) and that it is "[…] restricted to owners of mobile devices, and in many cases, to a subset of those owners who opt-in to receive communications from marketers […]" (p. 119).

In contrast, mass marketing addresses a wide array of consumers and is not restricted to owners of the mobile device type (Shankar and Balasubramanian 2009). Shankar and Balasubramanian (2009) established a clear distinction between mobile marketing and mass marketing in terms of the potential audience. They further emphasized the importance of mobile marketing anticipating a future increase of spending on mobile advertising by companies in the U.S. Zenith (2018) confirmed this prediction by stating that mobile advertising spending worldwide increased from USD 743 million in 2010 to USD 104,257 million in 2017.

[3] According to Bart, Stephen, and Sarvary (2014), mobile display ads promote an increase in favorable attitudes toward products and purchase intention, if the product type is of a high involvement and utilitarian nature.

Moreover, Shankar and Balasubramanian (2009) built a conceptual framework in order to analyze the field of mobile marketing and four key aspects in particular: key drivers of smartphone adoption, impact on customer decision-making through mobile marketing, establishment of a coherent mobile marketing strategy, and a global mobile marketing perspective. Further, they proposed six practical implications for mobile marketing which could help companies to thrive in the field of mobile marketing. First, they asserted that companies should rethink their value proposition regarding the mobile context; given that mobile devices are fundamentally different from desktop computers in terms of usage behavior and technical aspects, a company could bear the possibility of failure if it uses a similar strategy across electronic device types (Shankar and Balasubramanian 2009). Second, the foundation of effective mobile marketing is that consumers opt-in[4] via other channels such as television, print, or websites (Shankar and Balasubramanian 2009). Third, companies should not expect a positive short-term return on investments from heavy mobile marketing investments due to constant changes in consumers' mobile usage behavior (Shankar and Balasubramanian 2009). In fact, they suggested that companies should instead observe and learn about consumers' behavior in the mobile environment, ultimately with the objective to adjusting their initiatives to these behaviors. Fourth, they noted that communication via social channels is enabled through the characteristics of mobile devices (i.e., portable, personal, networked, textual/visual and convergence). Hence, it could be beneficial for companies to implement social media elements into their overall marketing strategy for mobile devices. Fifth, they suggested that the most important feature of mobile marketing might be location-specificity.[5] In comparison to marketing via stationary electronic device types (i.e., desktop computers) which is superior to mobile marketing in terms of information richness as well as accessibility of information, mobile marketing can leverage consumers' physical location to optimize its offerings (Shankar and Balasubramanian 2009). Sixth, they emphasized that mobile marketing, unlike mass marketing (which targets the entire customer base), should focus on customization of advertising messages to individual consumers or at least certain consumer segments (Shankar and Balasubramanian 2009).

[4] Kumar, Zhang, and Luo (2014) defined opt-in marketing as "[…] firms explicitly asking customers for permission, usually when an online account is created" (Kumar, Zhang, and Luo 2014, p. 404).

[5] "Many mobile devices, including car navigation systems, have GPS capabilities to identify their physical location" (Shankar and Balasubramanian 2009, p. 119).

2.2.2.2 Environmental Context

The novel and important characteristic of a smartphone is that it is the only electronic device type which always tracks its own physical location (Goh, Chu, and Wu 2015). Hence, Goh, Chu, and Wu (2015) encouraged marketers to unlock the smartphone's promotional potential via targeted mobile advertisements using location-based information. Similarly, Grewal et al. (2016) stated that the characterization of the environmental context in mobile marketing depends on two factors: where (e.g., location, weather or social context) and when (e.g., time of the day) the advertising message is distributed.

2.2.2.3 Location-Based Targeting

A vast amount of research in the field of mobile marketing regarding the environmental context has dealt with the physical location of the consumer (e.g., Hui et al. 2013a; Hui et al. 2013b; Shankar et al. 2010). Shankar et al. (2010) proposed a conceptual framework of mobile marketing that built on and extended the work of Shankar and Balasubramanian (2009) by emphasizing shifts in the physical retailing environment due to the growing importance of mobile marketing in that channel. Thereby, Shankar et al. (2010) addressed the three key entities of consumers, smartphones, and retailers as well as an array of corresponding topics such as mobile consumer activities, mobile consumer segments, mobile adoption enablers and inhibitors, key mobile properties, key retailer mobile marketing activities, and competition. Notably, they drew a distinction between virtual (i.e., mobile channel) and physical (i.e., retail channel) environments, suggesting that consumers' behavior differs depending on the context (i.e., consumers "[…] do not move around virtual environments the same way in which they do around physical environments" (p. 113)). Hence, companies face a challenge to leverage the full potential of mobile devices in the retail environment (Shankar et al. 2010). On the other hand, they asserted that mobile marketing "[…] has the potential to change the paradigm of retailing from one based on consumers entering the retailing environment to retailers entering the consumer's environment through anytime, anywhere mobile devices" (Shankar et al. 2010, p. 119). Alternatively, Hui et al. (2013a) proposed that retail companies could encourage consumers to use location-based applications (e.g., Foursquare) to indicate if and when the consumer enters the physical store. They noted that combining location-

specific information with data from applications that enable consumers to store their individual shopping lists (e.g., Grocery iQ) enables companies to tailor mobile promotional activities (e.g., individual coupons or product bundles) based on item categories on the consumer's shopping list, subsequently fostering unplanned purchases (Hui et al. 2013a).

A similar approach regarding in-store targeting was developed by Heilman, Nakamoto, and Rao (2002); namely, the usage of surprise coupons (e.g., electronic shelf coupons or peel-off coupons) at the point of sale. According to Heilman, Nakamoto, and Rao (2002), at least two probable causes contribute to consumers making more unplanned purchases in-store if they receive a surprise coupon. First, drawing on Arkes et al. (1994), Heilman, Nakamoto, and Rao (2002) argued that consumers' monetary savings from coupons are likely to create an unpredicted psychological income effect (i.e., unanticipated gains are spent more readily than gains that are anticipated) (see also Shefrin and Thaler 1988). Second, Heilman, Nakamoto, and Rao (2002) stated that if consumers were in a good mood because of the surprise savings, there is a high probability of an increase in purchases (see also Arkes, Herren, and Isen 1988; Donovan et al. 1994).

Similarly, in another study, Hui et al. (2013b) provided further evidence that mobile promotions prompted unplanned in-store purchases. According to them, unplanned spending in a simulation (for three product categories) was increased by 16.1% through mobile promotions relative to an estimated 7.2% increase in unplanned spending due to a physical relocation of product categories within the store (Hui et al. 2013b). Further, the authors conducted a field experiment where they provided promotional coupons on consumers' mobile phones to examine the coupons' effect on unplanned purchases in the physical retail environment (Hui et al. 2013b). Specifically, they found that that "[…] a coupon that required shoppers to travel farther from their planned path resulted in a substantial increase in unplanned spending ($21.29) over a coupon for an unplanned category near their planned path ($13.83)" (Hui et al. 2013b, p. 1).

The aforementioned results suggest that it could be beneficial for companies to use smartphones to leverage location-specific consumer data for promotional purposes. Fong, Fang, and Luo (2015) provided similar results regarding competitive locational targeting via smartphones (i.e., approaching consumers with promotional efforts if they are geographically close to a competitor's location). According to them, the term "geo-

fencing" is used among practitioners if consumers in close spatial proximity to the companies' location are targeted. In the case of targeting consumers who are geographically close to competitors' locations, the approach is called "geo-conquesting" (Fong, Fang, and Luo 2015, p. 726). Building upon initial predictions by Kenny and Marshall (2000), Fong, Fang, and Luo (2015) suggested that for a company to be successful in its mobile marketing efforts it is crucial to perform the right activities at the right place and time. A randomized field experiment in cooperation with a mobile service provider revealed the effectiveness (i.e., increased purchases) of mobile promotions due to geo-conquesting in real time compared to mobile promotions targeting the focal location (Fong, Fang, and Luo 2015). Hence, competitive locational targeting via smartphones combines the strengths of online and offline direct marketing techniques and might serve marketers as a fundamental strategic advantage (Fong, Fang, and Luo 2015).

Another interesting field study regarding responses to mobile promotions in form of coupons in the retail environment was conducted by Danaher et al. (2015). They recruited about 8,500 participants over a period of two years and sent mobile coupons to them when they entered the retail location.[6] According to Danaher et al. (2015), mobile coupons have certain characteristics which set them apart from traditional coupons (e.g., price off coupons for packaged goods delivered via newspapers). Specifically, their results demonstrated that besides spatial aspects (i.e., where the consumer is located) and temporal aspects (i.e., when the promotion is received) which significantly influenced coupon redemption, the expiry length of mobile coupons had a strong impact on the redemption rate as well. Since expiry lengths of mobile coupons are generally shorter than those of traditional coupons, the authors recommended indicating time urgency to the consumer by shortening the expiry length even further (Danaher et al. 2015).

As previously outlined in various examples, the physical location of consumers apparently has a significant influence on the effectiveness of mobile marketing activities. In addition, according to Andrews et al. (2015), not only the location but also physical crowdedness (i.e., how many individuals are in close spatial proximity to the consumer) significantly affects consumers' responses to mobile advertisements. In cooperation with a large telecommunication service provider that granted access to field data (i.e., a sample of

[6] The field study included 38 unique stores and almost 144,000 different coupons were sent.

14,972 active mobile phone users), Andrews et al. (2015) suggested that consumers in crowded locations such as a subway (in this case) are twice as likely to purchase a product after being exposed to a mobile advertisement compared to consumers in trains which are not crowded. According to them, the explanation for the observed effect is called mobile immersion. In particular, Andrews et al. (2015) explained that people tend to turn inwards if their perceived physical space is invaded by others due to increased crowding and thus become more receptive to mobile advertisements. Even though previous work on crowding mainly focused on negative emotions (i.e., risk-avoidance and anxiety), Andrews et al. (2015) provided evidence that mobile advertising could in fact serve as a welcoming relief from the mental pressure created in a crowded place such as a subway. They took a different approach than did the earlier qualitative work by Schau and Gilly (2003), which suggested that consumers' online experiences would have an impact on their offline activities and not vice versa.

2.2.2.4 Temporal Targeting

Smartphones enable companies to target consumers at any time (Luo et al. 2014) because of the wireless Internet connection (i.e., GPS technology) of the device type regardless of consumers' location (e.g., Balasubramanian, Peterson, and Jarvenpaa 2002; Larivière et al. 2013; Shankar and Balasubramanian 2009). According to Luo et al. (2014), companies could increase the odds of sales significantly (up to 76%) by using temporal targeting via promotional activities (i.e., discounted tickets via short message service (SMS)) on the day of a specific event (i.e., movie at a cinema) if the consumer was in close spatial proximity to the location (i.e., a cinema). Specifically, in a large-scale field experiment,[7] 12,265 smartphone users were sent SMS which contained discounted movie tickets (Luo et al. 2014). Thereby, Luo et al. (2014) sent the discounted tickets either on the same day, one day prior, or two days prior to the day when the movie was actually showing, and they controlled for the distance of the recipients to the cinema. Their results indicated that, if consumers were in close spatial proximity to the location (i.e., the cinema), same-day targeting was the most effective tactic whereas consumers who were further away from the location (i.e., the cinema) needed more time, thus, it was more effective to send the discounted offer in advance (Luo et al. 2014).

[7] The field experiment was conducted in cooperation with a mobile service provider.

In a similar vein, Goh, Chu, and Wu (2015) examined the effect of temporal targeting via smartphones on the relevance of mobile advertising campaigns. The authors used clickstream panel data from a mobile ad campaign about an automobile show and examined consumers' information search behavior as well as advertising responses before and during the campaign. Goh, Chu, and Wu (2015) found that the temporal proximity of advertisement to the event did not impact the relevance (i.e., the depth/breadth of the search or advertising response[8]) of an ad campaign since it also depended on the type of advertisement content (e.g., images viewed and characters viewed). Further, regarding the aforementioned advertising content, they recommended that practitioners should consider designing advertising content creatively and engagingly, always considering temporal aspects (i.e., when the consumer receives the advertisement) in order to realize increased response rates. In addition, they asserted that rank order of content is crucial for the success of an ad campaign. Hence, placing most relevant informational content on the top of the page with a clear call-to-action is essential (Goh, Chu, and Wu 2015).

To conclude, a growing body of literature regarding the environmental context of mobile marketing, has examined the importance of location-based mobile marketing activities (i.e., advertisements or coupons) and illuminated the opportunities which arise for practitioners when they consider these insights for their mobile marketing strategy (e.g., Andrews et al. 2015; Danaher et al. 2015; Fong, Fang, and Luo 2015; Hui et al. 2013a; Shankar et al. 2010). Moreover, various authors have provided evidence that appropriate timing of mobile marketing activities (i.e., when consumers receive promotional items) is the key to success for companies and may increase the monetary outcome of mobile marketing campaigns (e.g., Goh, Chu, and Wu 2015; Luo et al. 2014).

2.2.3 M-Commerce

2.2.3.1 Conceptual Foundation and Definition

The retail environment has changed fundamentally over the last two decades since the digitalization of sales channels has increased significantly (Verhoef, Kannan, and Inman 2015) and the technological obstacles (i.e., tiny screen size, small keypads, or limited

[8] "[…] a registration for a free car test drive on the mobile site — the key advertising response action that we focus on in this study" (p. 37).

bandwidth (Shugan 2004)) of mobile devices used in the retail context could be overcome through in-store targeting via mobile coupons due to GPS and sufficient bandwidth (Heilman, Nakamoto, and Rao 2002). Recently, Grewal, Roggeveen, and Nordfält (2017) advanced this discussion even further by specifically stating that the shopping landscape has been revolutionized by the introduction of smartphones. Moreover, m-commerce is one of the key drivers of this development because it provides great market opportunities for retailers by offering a third sales channel that is complementary to offline and online channels (Kim et al. 2017).

The concept of m-commerce was already present in the 1990s when Durlacher Research Ltd. (1999) defined m-commerce as "[…] any transaction with a monetary value that is conducted via a mobile telecommunications network" (p. 7). Through later technological advancements (i.e., the introduction of smartphones) the mobile sales channel gained further strategic importance for companies and increased its attractiveness to consumers (Wang, Malthouse, and Krishnamurthi 2015). Further, the relevance of m-commerce (i.e., "[…] using smartphones or tablets to compose, modify, or place orders" (Wang, Malthouse, and Krishnamurthi 2015, p. 217)) for industry and academia has increased dramatically in recent years. This development was underlined by results from eMarketer (2018), which indicated a global mobile retail revenue[9] of USD 1,357 million in 2017 (58.9% of digital sales) and further projected an increase of up to USD 3,556 million in 2021 (72.9% of digital sales). Another remarkable fact that supports the notion that mobile devices are gaining importance with regard to sales figures is that, for the first time in retail history, on Black Friday in 2016, mobile revenue surpassed the one billion dollar mark (i.e., USD 1.2 billion), which in turn was equal to a 33% increase over 2015 mobile revenue (Adobe Systems 2016).

Further, not only online but also offline purchases are influenced by smartphones. The leading[10] professional services firm Deloitte TTL asserted in 2012 that smartphones also had a major impact on in-store purchases, stating that over 60% of mobile shoppers used

[9] Mobile retail revenue includes products or services ordered via mobile devices (regardless of method of payment or fulfilment). However, it excludes travel and ticket sales (eMarketer 2018).

[10] On a global scale, Deloitte TTL was the leading professional service firm in 2017 (i.e., revenue of USD 38.8 billion) compared to the second largest firm of PricewaterhouseCoopers (i.e., revenue of USD 37.68 billion) and the third largest firm of Ernst & Young (i.e., revenue of USD 31.4 billion) (Statista 2018).

their smartphone during a shopping trip in the store (Lobaugh 2012). According to Lobaugh (2012), mobile influence on store sales amounted to USD 158 billion in 2012. These insights emphasized the notion that smartphones have changed business models in the retail environment, the operationalization of the retail mix, and consumer behavior in general (Verhoef, Kannan, and Inman 2015). Moreover, Verhoef, Kannan, and Inman (2015) observed a shift toward omni-channel retailing (i.e., consumers move through different channels during the search and purchase process) (see also Rigby 2011). Lemon and Verhoef (2016) supported Verhoef, Kannan, and Inman's (2015) argument by stating that the mobile channel interacts with other sales channels (i.e., brick and mortar stores), significantly improving cross-channel synergies and influencing the customer journey at various touchpoints. According to DeGusta (2012), smartphones had not been widely adopted in the early 2000s. However, Balasubramanian, Peterson, and Jarvenpaa had already investigated the opportunities and challenges for companies presented through m-commerce in their seminal paper of 2002. Describing m-commerce as in its incubatory stage, they specifically discussed future implications for marketing, and the possible impact of mobile technologies, and developed a taxonomy of m-commerce applications (Balasubramanian, Peterson, and Jarvenpaa 2002). Later research by Kleijnen, Ruyter, and Wetzels (2007) provided a framework of m-commerce that proposed three benefits (i.e., time convenience, user control, and service compatibility) and two costs (i.e., perceived risk and cognitive effort) that are associated with m-commerce.

2.2.3.2 Consumer Adoption of M-Commerce

A large and growing body of literature has investigated consumer intentions to use mobile services and largely draws on F. Davis's (1989) technology acceptance model (TAM) (Nysveen, Pedersen, and Thorbjørnsen 2005; see also F. Davis 1989; Davis, Bagozzi, and Warshaw 1989). According to Nysveen, Pedersen, and Thorbjørnsen (2005), the traditional TAM can explain intentions to use mobile services from the information systems perspective. However, Nysveen, Pedersen, and Thorbjørnsen (2005) proposed an extension of the TAM through application of various theoretical perspectives, namely, the theory of reasoned action (Fishbein and Ajzen 1975), theory of planned behavior (Ajzen 1991), and uses gratifications research (Höflich and Rössler 2001) to capture a "[…] more holistic understanding of the antecedents of consumers' intentions to use mobile services than existing research" (p. 331). Notably, building on uses and gratifications research (e.g.,

Höflich and Rössler 2001; Leung and Wei 2000), Nysveen, Pedersen, and Thorbjørnsen (2005) specified that positively related affective constructs such as enjoyment, fun seeking, and entertainment motivate consumers to use mobile services. Consistent with that argument, Cyr, Head, and Ivanov (2006) found that enjoyment in using m-commerce may also lead to mobile loyalty. In addition, Bruner and Kumar (2005) investigated attitudes regarding m-commerce adoption by examining usefulness and ease of use (i.e., utilitarian constructs which are used in the TAM) in combination with fun (i.e., an inherently hedonic construct); they asserted that "[…] the fun of using a device was a more powerful determinant of attitudes toward usage than the perceived usefulness of the device" (p. 557). However, Peters, Amato, and Hollenbeck (2007) stated that both of these studies (i.e., Bruner and Kumar 2005; Nysveen, Pedersen, and Thorbjørnsen 2005) are critically relevant to the field of m-commerce and the TAM because both support the notion that hedonic constructs (i.e., amusement and entertainment) influence consumers' attitudes and intentions toward the use of mobile services. These findings highlighted the hedonic component of smartphones which is discussed in greater detail in section 2.3.

Further, according to Ko, Kim, and Lee (2009), most research in the field of marketing has focused on the characteristics (i.e., ubiquity, convenience, localization, instant connectivity, and personalization) of m-commerce with regard to the adoption of the technology (see also Kleijnen, Ruyter, and Wetzels 2007) while Okazaki and Mendez (2013) highlighted how perceived ubiquity (i.e., "[…] a multidimensional construct consisting of continuity, immediacy, portability, and searchability" (p. 108)) is one of the most important characteristics of mobile services. Moreover, Ko, Kim, and Lee (2009) stated that m-commerce characteristics such as usefulness and ease of use determine technology adoption from a consumer perspective (see also Bruner and Kumar 2005; Nysveen, Pedersen, and Thorbjørnsen 2005). Further, building on previous research (e.g., Kulviwat et al. 2007; Nasco et al. 2008; Nysveen, Pedersen, and Thorbjørnsen 2005), Ko, Kim, and Lee (2009) argued that work in the field of technology adoption expanded initial theories (e.g., F. Davis 1989) through the linkage of cognitive and affective motivations. Notably, findings suggested that affective aspects of mobile services are correlated with technology adoption (Ko, Kim, and Lee 2009). They noted that previous research (e.g., Davis, Bagozzi, and Warshaw 1989; Kleijnen, Ruyter, and Wetzels 2007) provided evidence that consumers' perceived value of m-commerce depends on extrinsic and intrinsic benefits of technology use (Ko, Kim, and Lee 2009). Specifically, they

highlighted four characteristics of m-commerce (i.e., usefulness, enjoyment, instant connectivity, and ease of use), which indicated that consumers "[…] perceive mobile shopping services as heterogeneous in conjunction with utilitarian and affective benefits […]" (Ko, Kim, and Lee 2009, p. 683)). In summary, the various characteristics of m-commerce determine the perceived value of m-commerce for consumers and the adoption of m-commerce services (Ko, Kim, and Lee 2009; see also Kleijnen, Ruyter, and Wetzels 2007).

2.2.3.3 New Ways of Selling Through Smartphones

Recently, Grewal, Roggeveen, and Nordfält (2017) described a further evolution in the field of m-commerce; they drew on a practical example from the Internet company Amazon and illustrated a seamless consumer journey. In particular, they described the new concept of Amazon Go, which allows consumers to shop for groceries at a store without even paying the cashier via common payment methods (e.g., smartphone, cash, or credit card). According to Grewal, Roggeveen, and Nordfält (2017), advanced technologies and methods such as computational analysis of visual content, sensor fusion, or deep learning "[…] detect when products are taken from or returned to shelves and keep track of items in a virtual cart" (p. 2). Then, Amazon automatically charges consumers after the store visit.[11]

In another study, Wang, Malthouse, and Krishnamurthi (2015) analyzed large-scale field data (i.e., customer- and transaction-level across all grocery product categories) from an online grocery retailer to assess consumers' spending behavior after adopting m-commerce compared to such behavior when using a desktop computer. They found that consumers' order rate (i.e., the number of placed orders per year) and order size (i.e., the monetary value of the shopping basket) were increased when m-commerce was adopted compared to prior spending via desktop computers. Further, they proposed that the key element to these patterns is the unique technology of smartphones which leads to an incorporation of m-commerce into consumers' daily routines. They also recommended that companies should leverage the full potential of their mobile platforms while being

[11] In order to track consumers and connect their final product choices with the paying mechanism via the consumer's account, the consumer needs to scan the Amazon Go app at the entrance of the store (Grewal, Roggeveen, and Nordfält 2017).

cautious when launching new products since mobile platforms might not be the right channel to do so (Wang, Malthouse, and Krishnamurthi 2015).

Shankar et al. (2016) took a different approach by investigating a rapidly evolving area of research within the broader field of mobile marketing: mobile shopper marketing. This is different from regular mobile marketing since a shopper is not necessarily a consumer. They differentiated between the terminologies by stating that unlike a consumer, a shopper could purchase for consumption by others such as a parent buying products for a child. Further, the mindset of shoppers and consumers is fundamentally different; while a shopper has the mindset to shop for products when in an environment which facilitates purchase decisions, a consumer might primarily pursue consumption or disposal in any environment and not necessarily make a purchase (Shankar et al. 2016). More specifically, Shankar et al. (2016) defined mobile shopper marketing as "[…] the planning and execution of mobile-based marketing activities that influence a shopper along and beyond the path-to-purchase: from a shopping trigger, to purchase, consumption, repurchase, and recommendation stages" (p. 38). In this conceptual article they identified key entities of m-commerce marketing (i.e., the shopper, employee, organization, and mobile technology) and presented a process model which connects these entities with the m-commerce journey, ultimately encouraging future research avenues in this emerging field. In sum, these findings by Shankar et al. (2016) contributed to a more holistic understanding of the mobile shopping journey compared to the previously outlined literature in the field of mobile marketing (e.g., Kim et al. 2017; Wang, Malthouse, and Krishnamurthi 2015). In particular, Shankar et al. (2016) considered later stages in the mobile shopping journey (i.e., repurchase and recommendation) whereas other studies (e.g., Kim et al. 2017; Wang, Malthouse, and Krishnamurthi 2015) primarily examined factors influencing the mobile purchase decision a priori.

2.2.4 Summary

In sum, smartphones and desktop computers are inherently different because of technological aspects (e.g., input modalities, screen size, or portability), contextual usage (e.g., smartphones are often used for hedonic or social activities whereas desktop computers are used for work-related tasks), and the personal nature of the electronic device type (e.g., smartphones are perceived as more personal objects compared to desktop

computers). The author expects that characteristics such as personal value or portability and contextual usage, might influence consumers' decision-making during a customization process.

A considerable amount of literature has been published on mobile marketing and m-commerce, covering a wide array of topics such as growing revenue through newly formed mobile channels (e.g., Amazon Go) or the integration of innovative mobile marketing activities (e.g., individual targeting via location-based offers).

However, this dissertation takes a different approach by investigating if and to what extent handheld electronic device types (i.e., smartphones) relative to stationary electronic device types (i.e., desktop computers) affect consumers' WTP and final product feature composition in the context of consumer product customizations. Moreover, it examines the underlying psychological mechanisms (i.e., hedonic and social value attribution to the electronic device type) that explain consumer decision-making in a product customization context and thereby extends prior research on human-computer interaction in marketing.

2.3 Hedonic Value Attribution

Observing people around us staring at their smartphone screens leads to the impression that this precious electronic device type has become a constant companion in our daily lives. In various situations (e.g., on the bus, during a shopping trip, or when with a group of friends) people seem to be engaged by the content on the screen, conveying the image of a modern victim of digitalization. However, there are moments were the typical "smartphone smile" (i.e., a person who smiles while using a smartphone) is visible on the face of a person and in that moment we usually ask ourselves why is this person so happy? A reasonable answer to that question might be that this person is smiling because he or she is consuming some entertaining content which is displayed on the smartphone screen. The association of our smartphone with enjoyable moments or activities could be interpreted as a hedonic value attribution toward the smartphone.

2.3.1 Smartphone Usage Behavior

The findings previously outlined in section 2.2.1 demonstrate that one of the technological characteristics of smartphones which primarily sets them apart from desktop computers is

their portability and thus their ubiquitousness in our everyday life. Specifically, consumers are enabled to use the functionalities of smartphones anytime and anywhere due to the portability of this electronic device type. The portability of smartphones enables consumers to carry the device with them at all times, usually in a trouser pocket or held firmly in the hands. Prior research has shown that the activities primarily performed on a smartphone are of a hedonic nature (e.g., entertainment) (Balasubramanian, Peterson, and Jarvenpaa 2002; Larivière et al. 2013; Nysveen, Pedersen, and Thorbjørnsen 2005; Shankar and Balasubramanian 2009). Chong (2013) emphasized this argument by asserting that consumers prefer smartphones over desktop computers for hedonic activities (i.e., watching videos or listening to music) due to the accessibility of content. Further empirical evidence for that argument was provided by Buckle (2017). Among 72,529 respondents worldwide,[12] 39% of Internet users used a smartphone to stream music compared to 30% who used a desktop computer (Buckle 2017). The example of streaming music by Buckle (2017) describes a typical hedonic activity performed on smartphones which inhibits enjoyment for consumers. In contrast, desktop computers are usually associated with work-related tasks (Shen, Zhang, and Krishna 2016) or perceived as functional gadgets (Wang, Malthouse, and Krishnamurthi 2015) relative to smartphones. Moreover, Dhar and Wertenbroch (2000) underlined that argument by suggesting that desktop computers are primarily instrumental and functional.

Thus, usage patterns (i.e., activities usually performed on a smartphone) determine the perception consumers have of their smartphone which in turn might influence consumers' behavior in various situations. Specifically, the author assumes that consumers perceive their smartphone as a hedonic object since they use the device primarily for hedonic activities which can be interpreted as a form of hedonic value attribution to the smartphone. Prior research has underlined that argument by stating that if a good (i.e., in this case the smartphone) offers a benefit in the form of experiential enjoyment, then it is a hedonic good (Batra and Ahtola 1991; Hirschman and Holbrook 1982; Mano and Oliver 1993; Okada 2005). Therefore, the author suggests that a priori affective involvement of consuming enjoyable content (e.g., entertainment) leads to consumers' hedonic attitude toward their smartphones which subsequently influences consumption behavior.

[12] One month in the second quarter of 2016; 72,529 respondents; age group 16-64 years.

Prior research has shown that consumers have hedonic motivations (e.g., enjoyment, fun seeking, and entertainment) in the use of smartphones or related services performed on a smartphone (e.g., m-commerce, music streaming, and video content) (Bruner and Kumar 2005; Chong 2013; Nysveen, Pedersen, and Thorbjørnsen 2005). Further, Kim, Kim, and Wachter (2013) proposed that "Smartphones, for example, allow users to control when, where, and how they engage in chosen activities that serve their needs […]" (p. 361) while asserting that consumers' motivations to use their smartphone and foster engagement in those activities (e.g., entertainment) are primarily of a hedonic nature. These patterns can be described as a form of hedonic consumption, a phenomenon that was formally defined by Hirschman and Holbrook in 1982 as "[…] those facets of consumer behavior that relate to the multisensory, fantasy and emotive aspects of one's experience with products" (p. 92). They also stated that consumers seek emotional arousal when their emotional consumption involves product classes such as novels, plays, or events (see also Holbrook 1980) which is similar to the activities predominantly performed on smartphones (e.g., Bruner and Kumar 2005; Chong 2013; Nysveen, Pedersen, and Thorbjørnsen 2005). In a similar vein, Venkatesh, Thong, and Xu (2012) suggested that the behavioral intention to use a certain technology is in some cases more determined by consumers' hedonic motivation (e.g., enjoyment) than other factors such as performance expectancy.[13] Venkatesh, Thong, and Xu (2012) formally defined hedonic motivation as "[…] the fun or pleasure derived from using a technology" and further note that "it has been shown to play an important role in determining technology acceptance and use" (p. 161)[14] (see also Brown and Venkatesh 2005).

Yang (2010) took a different approach by investigating driving factors of consumer behavioral intention to use mobile shopping services in the U.S. In particular, she provided evidence for a positive effect from hedonic performance expectancy on attitudes toward using mobile shopping services. She thus asserted that hedonic or entertainment aspects

[13] The term "performance expectancy" was defined by Venkatesh, Thong, and Xu (2012) as "[…] the degree to which using a technology will provide benefits to consumers in performing certain activities" (p. 159).

[14] In addition, Venkatesh, Thong, and Xu (2012) provided evidence that consumers are "[…] motivated more by the hedonic benefits gained from using a technology" (p. 174).

are pivotal determinants of consumers' intention to use mobile shopping services.[15] Therefore, the author expects that the aforementioned hedonic intentions to use a mobile shopping service may also apply in other contexts such as a product customization conducted via a smartphone.

2.3.2 Hedonic Value Attribution Leads to Higher WTP

Consumers tend to be less price sensitive in situations where they are in a pleasant or enjoyable atmosphere (Wakefield and Inman 2003) such as being on vacation in a foreign city. For example, buying a drink in a bar while vacationing in a major city (e.g., New York City) probably costs more compared to buying that same drink in a bar in one's home town. However, consumers still accept that price because they are on vacation with their friends or family and simply want to enjoy the metropolitan atmosphere of "the Big Apple" underpinned by a feeling of lightheartedness that comes with a vacation to an enticing destination such as New York City. This fictive example reveals a psychological mechanism which is prominent in human behavior; namely, a loss of price sensitivity in hedonic situations. The author deduces that this psychological mechanism is triggered when consumers use their smartphone (vs. their desktop computer) since consumers predominantly use the smartphone for hedonic activities.

Research by Wakefield and Inman (2003) supports this assumption. In particular, Wakefield and Inman (2003) examined the usage context or occasion of purchases as related to consumers' WTP (i.e., consumers' price sensitivity) in social and hedonic situations (e.g., visiting a theme park) compared to their WTP in nonsocial and functional situations (e.g., a trip alone to the supermarket). In particular, they proposed that "[…] differences in the motivations underlying the purchase […] across hedonic and functional situations should lead to price being relatively more important in functional products and situations than in hedonic products and situations" (Wakefield and Inman 2003, p. 202). They further argued that consumers are willing to spend more (i.e., are less price sensitive)

[15] The term "hedonic performance expectancy" as it relates to a mobile service was defined by Yang (2010) as "[…] the degree to which an individual believes that using the technology services is fun" (p. 264) (see also Davis, Bagozzi, and Warshaw 1992). Drawing on fundamental research in the field of hedonic consumption (e.g., Babin, Darden, and Griffin 1994; Holbrook 1999), Yang (2010) further elaborated that "Hedonic performance expectancy includes the experiential and emotional aspects of services derived from the multisensory, emotive, and entertainment aspects of experiences in the consumption process" (p. 264).

if they can derive fun or relaxation from using the product or service. Further, they provided evidence that for 59%-66% of the sample, price sensitivity was high in functional consumption occasions (e.g., spending on frozen vegetables or gasoline) compared to 31%-43% of the sample who reported high price sensitivity in hedonic consumption occasions (e.g., spending on sporting events or restaurant visits) (Wakefield and Inman 2003).[16] Building upon these findings of Wakefield and Inman (2003), the author expects that since consumers primarily use their smartphone (vs. their desktop computer) in hedonic contexts, the mechanism of consumers' higher WTP in hedonic contexts applies when consumers customize a product via their smartphone.

2.3.3 Transfer of Hedonic Experiences

A central tenet of this dissertation is that consumers have hedonic associations with certain consumption situations which might affect their behavior in other consumption situations. As previously addressed, because consumers use smartphones for hedonic activities, in many cases the smartphone itself might be associated with hedonic experiences (i.e., emotions of pleasure and arousal). A downstream consequence of this association might be a carry-over effect of hedonic value attribution toward other activities performed with that smartphone. Hence, the author assumes that if consumers customize a car via their smartphone, the customization process is subsequently perceived as a hedonic activity which is partially derived from the actual usage and pre-usage of that smartphone. Notably, Menon and Kahn (2002) supported that assumption by stating "[…] when consumers engage in hedonic browsing, they may use their affective feelings as a guide while evaluating any target […] they may mistakenly attribute a preexisting affective state as a reaction towards the target stimuli" (p. 33). In addition, they stated that these experienced hedonic emotions lead to higher favorable evaluations toward target stimuli (e.g., exploring a new website) (see also Schwarz 1990). Based on these considerations, the author expects that in the case of smartphone usage, a preexisting affective hedonic state, which is derived from past hedonic activities, is attributed toward the customizable product.

[16] Wakefield and Inman (2003) noted that "Hedonic motives and social situations offer a theoretical explanation for price discrimination practices (i.e., context-specific reference prices)" (p. 208). Specifically, building upon prior research by Cassady (1946), Wakefield and Inman (2003) provided evidence for the specific occasions when consumers are prone to effective price discrimination.

Thereby, using the setting of an online consumer product customization to test the proposed assumptions compared to using a regular online shopping setting may yield various advantages. Notably, consumer product customization architectures are gaining importance from a managerial perspective since the personalization of products is an evident trend across various industries (e.g., automotive, apparel, and furniture).

Taken together, the perception of as well as usage behavior with electronic device types differs to a notable extent between electronic device types (smartphones vs. desktop computers) regarding their inherent nature. In particular, whereas smartphones are used for hedonic activities, desktop computers are used for functional activities. The author expects that the increase in hedonic value attribution to the product is translated into an increase in consumers' WTP (for an overview of the hypothesized effects, see Figure 2-1). Specifically, the author proposes that:

> *H_1: The use of smartphones vs. desktop computers increases consumers' willingness to pay for a customized product.*
>
> *H_2: The positive effect of smartphones on consumers' willingness to pay for a customized product is mediated by an increase in hedonic value attribution.*

2.4 Social Value Attribution

What do cave paintings, orally transmitted legends, tabloid newspapers, and smartphones have in common? Each one of them has served different types of social networks (Jordan 2012). The evolution of technology has helped humanity to further develop its tools for sharing information, communicating with each other, and staying connected within its respective social communities. Turkle (2011) moved beyond this understanding and proclaimed that multifunctional electronic device types, such as smartphones, support individuals when feeling lonely (e.g., teenagers whose parents are not at home) and ultimately described them as the glue which holds together the personal aspects of life. Similarly, Srivastava (2005) described the smartphone as a social object which "[…] gives consumers the impression that they are constantly connected to the world outside, and therefore less alone" (p. 113). Bayer, Campbell, and Ling (2016) extended that view by stating "We have moved into a stage where mobile technology has not only reached saturation in terms of ownership, but also become a basic element of social life" (p. 128)

(see also Jacobson, Mortensen, and Cialdini 2011; Rainie and Wellman 2012). Hence, the association of our smartphone with social contexts could be interpreted as a social value attribution toward the smartphone.

2.4.1 The Personal Nature of Smartphones

Smartphones have an inherently personal nature (i.e., consumers perceive smartphones more as personal objects than as functional gadgets such as desktop computers) (e.g., Bacile, Ye, and Swilley 2014; Danaher et al. 2015; Goh, Chu, and Wu 2015; Larivière et al. 2013). Prior research by Jung (2014) emphasized this argument by stating that smartphones have a "highly personalized nature" (p. 300). Typically, smartphones are associated with social interactions: that is, they are used to communicate with friends and family via messaging services or social media applications (Oulasvirta et al. 2012) and thus they not only "[…] enhance our social life but also embody it" (Vincent 2006, p. 39). Thereby, not only personal data (e.g., photos or private messages) is exchanged and stored on the smartphone but personal emotions such as a sense of belonging or attachment to the smartphone might also be evoked. Some individuals even form such an intimate relationship with their smartphone that they take the device with them to bed or give it a name. Relatedly, YouGov (2017) showed that 53% of U.S. teenagers between age 13 and 17 indicated that they could only manage without using their smartphone for one day or less compared to 27% who gave the same response for using their desktop computer. Conversely, 39% of U.S. teenagers stated that they could manage without using their desktop computer for more than a week whereas only 18% of teenagers stated that they could manage without using their smartphone for more than a week (YouGov 2017). Similarly, Bayer, Campbell, and Ling (2016) suggested that "Staying 'connected' has become a societal norm and a personal habit" (p. 128). Thus, the author proposes that consumers perceive smartphones as personal objects with which they have a deep emotional relationship, beyond a typical relationship with an electronic device type (e.g., a desktop computer) and that this could be interpreted as a form of social value attribution to the smartphone.

This social value attribution to smartphones through social interactions and thus, their personal nature, relative to desktop computers, has been exemplified by prior survey-based research. In particular, a survey among U.S. consumers showed that for social activities

81% used a smartphone while only 19% used a desktop computer, whereas the opposite (39% vs. 61%, respectively) held for work-related tasks; this demonstrates that electronic device type usage differs between work and social contexts (IAB 2017; see also Google 2017). Saad (2015) emphasized that argument by stating that smartphones are used more frequently for personal communication compared to desktop computers, which are primarily used for functional tasks such as managing finances. Specifically, results from a large field study of 15,776 U.S. adults showed that 44% of adults used their smartphone to communicate with personally related individuals (i.e., friends or family) via social media or messenger apps whereas only 24% of adults used their desktop computer for the same purpose (Saad 2015). However, 59% of adults stated that they managed their finances via their desktop computer compared to 18% of adults who stated that they managed them via their smartphone (Saad 2015). These findings hint toward the idea that smartphones serve more as a tool for social interaction than do desktop computers.[17] Support for this notion comes from Beasley et al. (2016), who stated that consumers view their smartphones "[…] as a tool for navigating their social lives better by helping them […] feel connected with friends, feel included with peers, gain approval from peers, create social harmony with peers, avoid disapproval and rejection from peers, coordinate getting together with friends, and catch up with family and friends" (p. 32). Consequently, consumers start to build a relationship with their smartphone which subsequently affects future interactions with other individuals (Wang et al. 2007). It is expected that the socially meaningful relationship that consumers have with their smartphone influences future behavior when they use the smartphone in other contexts such as product customizations.

2.4.2 Social Influences on Consumers

A growing body of research supports the contention that human-computer interaction prompts social responses from consumers since electronic device types "[…] are close enough to a human" in the way that they interact with individuals (Reeves and Nass 1996, p. 22). In particular, smartphones enable consumers to continuously stay in touch with their social network, overcoming the main constraint of face-to-face communication,

[17] Accordingly, Apple Inc. revealed that most downloaded applications (the top three positions) in the iTunes online store in 2016 were social context-related communication applications (Snapchat, Facebook or Instagram) (Bell 2016; see also Barkhuus and Polichar 2011).

thereby disposing of spatial-temporal contiguity (Riva 2010). Therefore, individuals primarily use social applications (e.g., Facebook, Instagram or Twitter) to stay informed and react instantly to incidents via their smartphone (Barkhuus and Polichar 2011). Hence, the artificial social presence of others (i.e., consumers perceiving other individuals as present) is constantly provided, even though these others are not physically present in the digital space. Consequently, there may be a social impact on the consumer due to that social presence. Latané (1981) supported this notion by defining social impact as "[…] any of the great variety of changes in physiological states and subjective feelings, motives and emotions, cognitions and beliefs, values and behavior, that occur in an individual, human or animal, as a result of the real, implied, or imagined presence or actions of other individuals" (p. 343). In the context of this dissertation, social impact is an effect on the consumer, driven by social influences which determine how consumers think and behave. The author expects that the social value attribution that occurs when using a smartphone also affects consumers' decision-making when customizing a product. In particular, the author proposes that the social value attribution to a smartphone leads consumers to process displayed objects on that smartphone, such as customizable product features, with a comparable social value attribution.

However, it is not evident if and to what extent social value attribution to the smartphone affects consumers' ultimate product feature choice and, thus, final product feature composition when customizing products with the smartphone. The author proposes that consumers associate displayed objects on the smartphone with the equivalent social value attribution to their smartphone. Specifically, the author interprets the final product feature composition as a representation of the social value attribution which the consumer makes toward the smartphone. Thus, the social attributes of the smartphone are also assigned to customizable product features since consumers' awareness of the existence of others (i.e., peers, friends, and family) and their relationship with these others is subconsciously present during the customization process. This influences consumers' decision-making (i.e., choice of symbolic product features). Empirical support for this idea is presented by Nysveen, Pedersen, and Thorbjørnsen (2005), who stated that the gratifications consumers receive from using smartphones are related to status and sociability which are expressed through the usage of mobile services (see also Höflich and Rössler 2001). Further, they stated that "The importance of these gratifications indicates that the use of mobile services may be a way to express personality, status, and image in a public context. Expressiveness

can be seen as people's perception of a mobile service's ability to express both social and personal identity dimensions" (Nysveen, Pedersen, and Thorbjørnsen 2005, p. 332; see also Stryker and Burke 2000). Building upon research regarding expressiveness in the context of consumer research by Mittal (1994), Nysveen, Pedersen, and Thorbjørnsen (2005) further argued that "[…] expressiveness indicates how well a product expresses values beyond instrumental utility" (p. 332).

Based on these considerations, the author expects that the final product feature composition comprises more socially visible product features (e.g., sport wheels) when using a smartphone (vs. a desktop computer) to customize a car. The rationale behind this assumption is that "[…] social connectedness transforms from a possibility to a presumption, the connection norm becomes an added mental 'context' that can shape behavior without conscious thinking" (Bayer, Campbell, and Ling 2016, p. 131). Thus, consumers' feature choices during the customization process might be influenced by the social value attribution given the electronic device type which is used to customize a product.

According to Solomon (1983), the aforementioned symbolic need is motivated by social meaning rather than functional utility. Similarly, Park, Jaworski, and MacInnis (1986) defined symbolic needs as "[…] desires for products that fulfill internally generated needs for self-enhancement, role position, group membership, or ego-identification" (p. 136).[18] Therefore, it is expected that the symbolic need can be triggered by the socially-related associations and relationships individuals foster through their smartphones. Naylor et al. (2008) supported this argument by stating that "A product that carries symbolic meaning conveys that meaning to both the individual and to others" (p. 50). For example, if a consumer takes an extravagant vacation such as a stay in a fancy resort, this vacation conveys a message to other individuals (e.g., family, friends, and peers) which indicates a certain financial status (Naylor et al. 2008). In a similar vein, Thompson and Norton (2011) stated that social concerns (i.e., the impression which is formed by other individuals) are the reason for consumers to choose products which have positive associations for their

[18] To gain a thorough understanding of the relationship between symbolic needs and consumption, a review of fundamental research in the fields of symbolic consumer behavior (e.g., Levy 1959; Martineau 1958; Sirgy 1982; Solomon 1983) as well as the sociology of consumption (e.g., Nicosia and Mayer 1976; Wallendorf and Reilly 1983) is suggested.

reference groups (see also White and Dahl 2006). This argument is consistent with that of Ireland (1994) who stated that consumers do indeed care about how other individuals view them. Thus, he endeavors "[…] to engage in consumption signals which attempt to establish higher levels of status than their true status type" (Ireland 1994, p. 91). Therefore, when consumers are using a smartphone to customize a product, consumers' choice of socially visible features might be the downstream consequence of the aforementioned impact of symbolic needs on consumer behavior since using a smartphone may trigger social value attribution toward the smartphone.

Building on this understanding, the author suggests that the linking of social value attribution and customizable product features affect the final product feature composition of a self-customized product. Specifically, the author hypothesizes that the use of smartphones to customize a product leads to a final product feature composition which comprises more socially visible (i.e., symbolic) product features relative to product customizations made on desktop computers (for an overview of the hypothesized effects, see Figure 2-1). Specifically, the author proposes that:

> *H_3: The use of smartphones vs. desktop computers leads to a final product feature composition which comprises more socially visible product features.*
>
> *H_4: The positive effect of smartphones on the final product feature composition which comprises more socially visible product features is mediated by an increase in social value attribution.*

2.5 Overall Conceptual Model

Overall, the presented findings in Chapter 2 set the theoretical foundation of the current research work. Based on this theoretical foundation, four research hypotheses were derived. Figure 2-1 depicts the overall conceptual model of this dissertation and summarizes the hypotheses which will be tested in course of the next chapter (Chapter 3).

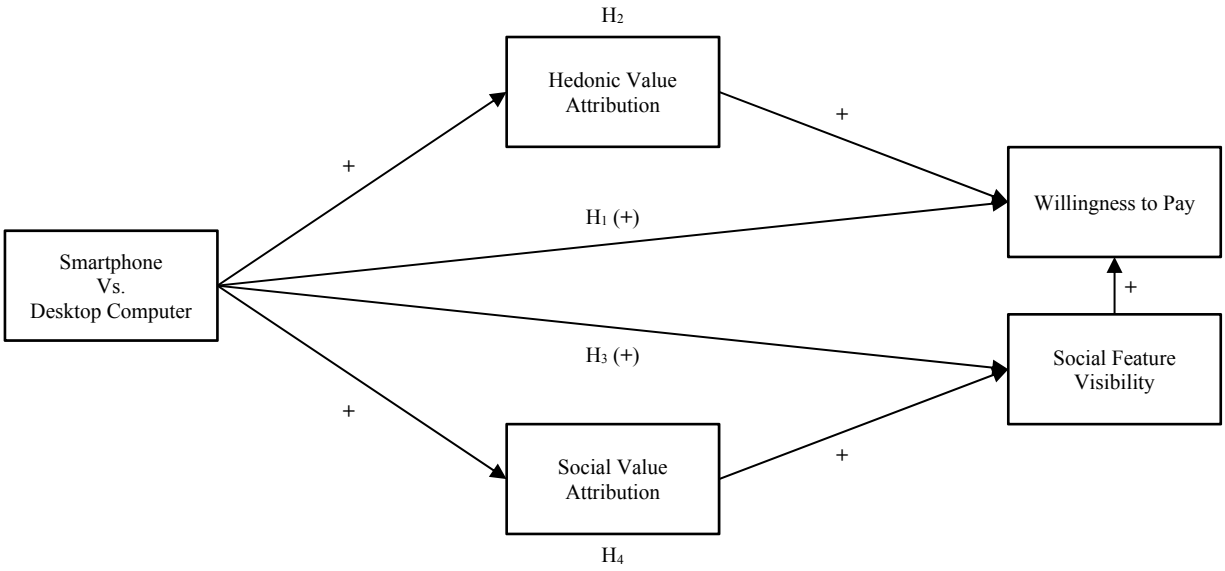


Figure 2-1. Conceptual Model.

3 Research Design, Methodology, and Results

The author conducted four studies that aimed to test the hypothesized effects of electronic device type usage (smartphone vs. desktop computer) on consumers' WTP for a customized product (measured through the consumer product customization value in EUR or USD, depending on the research study setting) and the final product feature composition of consumer product customizations.

In Study 1, a large-scale field study conducted in cooperation with a German premium car manufacturer, the author examined the effect of electronic device type usage (smartphone vs. desktop computer) on consumers' WTP for a customized product. In Study 2, the author examined the effect of electronic device type usage (smartphone vs. desktop computer) on the final product feature composition of consumer product customizations. Moreover, the author analyzed consumers' associations and value attributions (hedonic and social) with electronic device types (smartphone vs. desktop computer). In Study 3, the author examined the effect of electronic device type usage (smartphone vs. desktop computer) on consumers' WTP for a customized product as well as on the final product feature composition of consumer product customizations by applying a controlled experimental paradigm (i.e., a random assignment of participants to experimental conditions). Finally, in Study 4, the author tested the conceptual model (i.e., the underlying psychological mechanisms that were hypothesized to explain the effect of electronic device type usage (smartphone vs. desktop computer) on consumers' WTP for a customized product and the final product feature composition) in a consumer product customization context.

Table 3-1 summarizes the basic characteristics of the research studies, including the type of research study, design of the research study (if applicable), hypotheses that were tested in the research study, and the number of observations that were considered in the research study.

Overview of Research Studies

Study 1: General Differences Between Electronic Device Types	
Type of Research Study	Field study
Design	N/A
Hypotheses	Hypothesis 1
Observations	N = 52,531,463 unique website visitors
Pages in the Dissertation	57-63
Study 2a: Specific Consumer Associations with Electronic Device Types	
Type of Research Study	Online survey
Design	N/A
Hypotheses	N/A
Observations	N = 67 participants
Pages in the Dissertation	63-65
Study 2b: Social Visibility of Car Features	
Type of Research Study	Field study
Design	N/A
Hypotheses	Hypothesis 3
Observations	N = 7,396 unique car customizations
Pages in the Dissertation	65-67
Study 2c: Rating of Electronic Device Type Value Attribution	
Type of Research Study	Experiment
Design	Within-subject design (smartphone vs. desktop computer)
Hypotheses	N/A
Observations	N = 120 participants
Pages in the Dissertation	67-70
Study 3: Experimental Car Customization Task	
Type of Research Study	Experiment
Design	Between-subject design (smartphone vs. desktop computer)
Hypotheses	Hypotheses 1 and 3
Observations	N = 100 participants
Pages in the Dissertation	70-74
Study 4: Experimental Car Customization Task (Mediation Analysis)	
Type of Research Study	Experiment
Design	Between-subject design (smartphone vs. desktop computer)
Hypotheses	Hypotheses 1, 2, 3, 4
Observations	N = 106 participants
Pages in the Dissertation	74-79

Table 3-1. Overview of Research Studies.

3.1 Study 1: General Differences Between Electronic Device Types

The goal of Study 1 was to gain an initial understanding of the effect of electronic device type usage (smartphone vs. desktop computer) on consumers' WTP for a customized product. In particular, the rationale of Study 1 was to test, based on large-scale field data, hypothesis H_1: that the usage of smartphone vs. desktop computer in a consumer product customization task increases consumers' WTP for a customized product (represented by the increase of monetary customization value).[19] The research study was conducted in cooperation with a German premium car manufacturer. The cooperation partner provided car customization and process data that were generated via the car manufacturers' web-based car customization architecture.

3.1.1 Method

The cooperation partner (a German premium car manufacturer) provided car customization data (i.e., records of actions of visitors within the car manufacturers' web-based car customization architecture that were tracked via the car manufacturers' web analytics system) and process data (i.e., records of general visitor- and/or visit-specific characteristics that were tracked via the car manufacturers' web tracking system). The data sources (car customization and process data) were merged via unique identifiers (IDs) that characterized each visitor (i.e., visit) to the car manufacturers' web-based car customization architecture. The merged data sources constituted the basis for the following calculations.

The data referred to a total of N = 52,531,463 unique website visitors[20] with a total of N = 95,427,279 million visits over a time-span of 36 months (01/01/2014-12/31/2016). The following analysis referred to single visits to the website of the car manufacturer to ensure a maximum granularity of observations. In addition, in the course of Study 1, data subsets were provided by the cooperation partner and labeled accordingly in each analysis.

[19] In this and the following studies we refer to customization values which do not necessarily reflect customization values of actual purchases.

[20] The number of visitors to the website of the car manufacturer included all visitors that used any kind of electronic device types (i.e., desktop computer, smartphone, tablet, television, media player, gaming console, or e-reader) to visit (i.e., access) the website of the car manufacturer and subsequently the web-based car customization architecture.

The data included the following metrics on a visit level: monetary baseline car customization value in EUR, monetary difference between the baseline and final car customization value in EUR (i.e., increase in customization value), electronic device type used (i.e., electronic device type used to access the website of the car manufacturer and subsequently the web-based car customization architecture), date and time of the visit to the car manufacturers' web-based car customization architecture (i.e., contextual cues), and record of page visits that constituted the basis for the definition of completed customizations. "Completed customizations" indicated that the visitor completed all customization stages, including the final "overview" stage, within the visit to the car manufacturers' web-based car customization architecture.

In addition, the data included information on referrer websites that visitors visited prior to navigating to the website of the car manufacturer. Information on referrer websites allowed identification of an individual's browsing history (Oh, Lee, and Lee 2011) if the individual allowed the respective website provider(s) and/or maintainer(s) to track the respective information (also known as "cookies" (Clifton 2012)). The information on referrer websites could be used to analyze visitors' prior experiences when visiting the targeted website of interest and, consequentially, to capture the individual context of the visit of the targeted website with specific regard to the current research. Information on referrer websites could be used to analyze differences in customization behavior between (social vs. nonsocial linked) referrer websites to identify differences in the usage behavior of visitors who used either a smartphone or desktop computer to visit the website of the car manufacturer and subsequently the web-based car customization architecture.

3.1.2 Results

First, the results demonstrated that in the year 2016, 28.15% of all unique website visitors (N = 20,374,389) accessed the website of the car manufacturer via a smartphone compared to 58.39% of visitors who accessed the website of the car manufacturer via desktop computer. Even though more than half of all visitors used a desktop computer to access the website of the car manufacturer, an increasing portion of visitors to the website used a smartphone to access it, demonstrating a shift in patterns between electronic device types (smartphone and desktop computer) in the considered time-span of 36 months (01/01/2014-12/31/2016) as presented in Figure 3-1.

Findings were as follows. First, while over the time-span of 36 months (01/01/2014-12/31/2016; N = 52,531,463) the number of unique visitors who accessed the website of the car manufacturer via a desktop computer decreased slightly (11,897,108 visitors in 2014 compared to 11,896,145 visitors in 2016; decrease of .01%), the number of unique visitors who accessed the website of the car manufacturer via a smartphone, increased substantially (1,268,181 visitors in 2014 compared to 5,734,548 visitors in 2016; increase of 352.19%). Moreover, within the same time-span (01/01/2014-12/31/2016), the number of completed car customizations for visitors who accessed the web-based car customization architecture via desktop computers increased by 10.07%, while completed car customizations for visitors who accessed the web-based car customization architecture via smartphones increased by 1,083.28%.

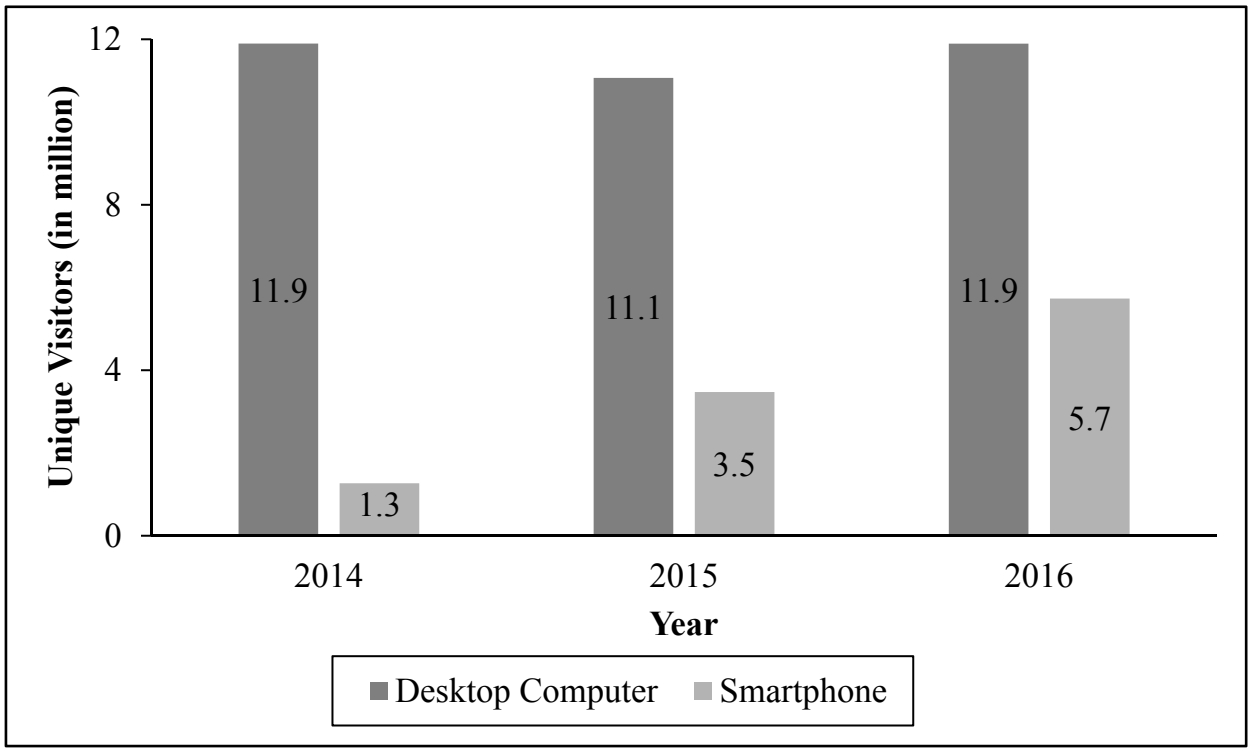


Figure 3-1. Unique Visitors on Website of the Car Manufacturer.

Second, the results demonstrated that visitors who accessed the web-based car customization architecture via a smartphone (within the time-span of 36 months (01/01/2014-12/31/2016)) spent, on average, EUR 681 more for the customized car compared to visitors who accessed the web-based car customization architecture via a desktop computer. This analysis referred to N = 10,456,875 unique customizations.

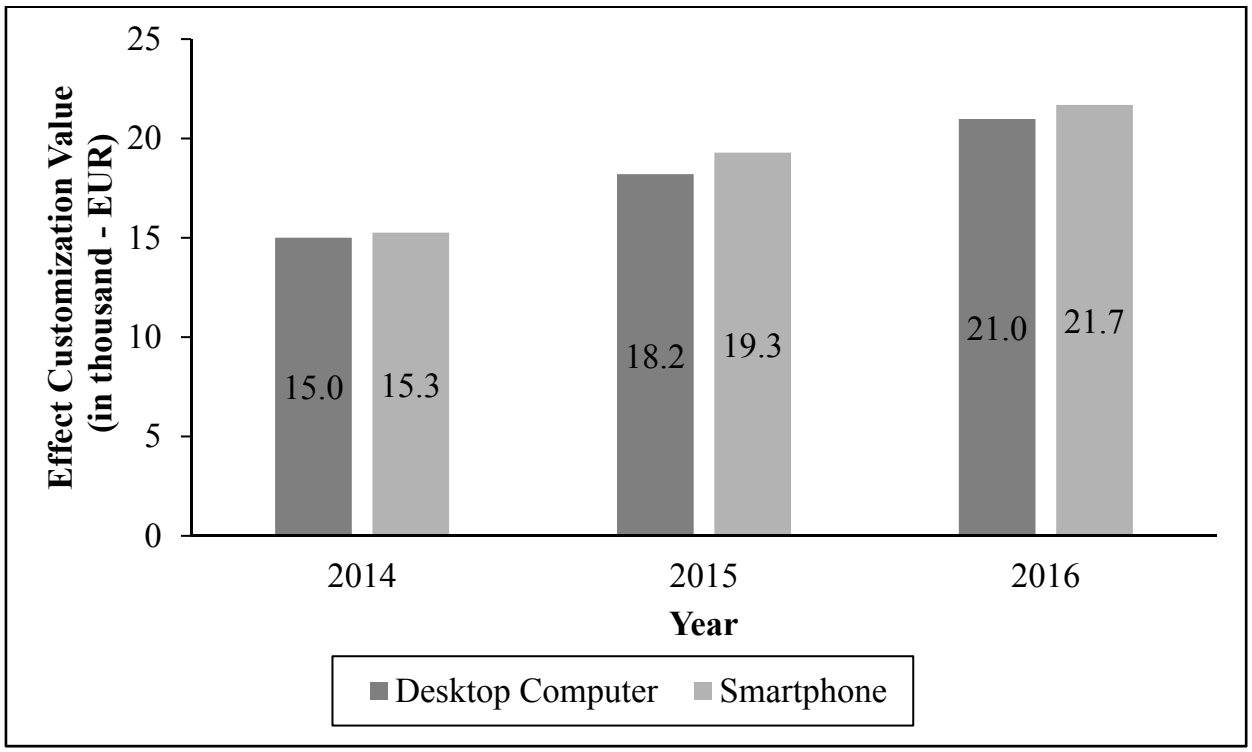


Figure 3-2. Effect Customization Value 2014-2016.

Third, the analysis of referrer websites demonstrated that, 12.55% of visitors who accessed the web-based car customization architecture via a smartphone visited a social network website (e.g. Facebook) before entering the web-based car customization architecture, whereas only .96% of visitors who accessed the web-based car customization architecture via a desktop computer visited a social network website before entering the web-based car customization architecture. This analysis referred to a subset of data, provided by the cooperation partner (N = 1,834,430 unique website visitors in a time-span of 12 months (09/01/2015-08/31/2016)).

Fourth, the analysis of contextual cues demonstrated that usage behavior among visitors who accessed the website of the car manufacturer via a smartphone or desktop computer differed in terms of time of day. In particular, visitors who accessed the website of the car manufacturer via a desktop computer substantiated the majority audience proportion at 11 a.m. CET (75.08%), compared to the percentage of visitors who accessed the website of the car manufacturer via a smartphone (16.11%). However, visitors who accessed the website of the car manufacturer via a smartphone substantiated the relative majority audience proportion at 4 a.m. CET (37.42%), compared to visitors who accessed the website of the car manufacturer via a desktop computer (52.59%). This analysis referred

to a subset of data, provided by the cooperation partner (N = 32,656,510 unique website visitors in a time-span of 12 months (09/01/2015-08/31/2016)).

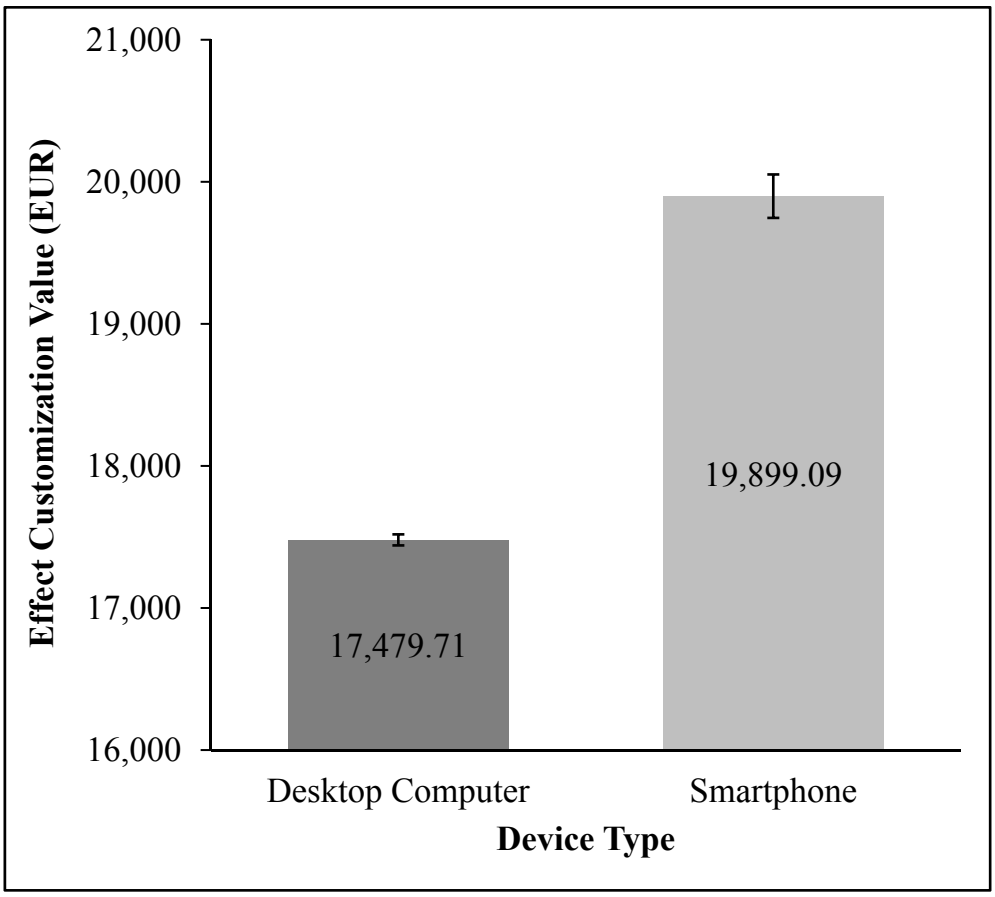


Figure 3-3. Effect Customization Value (Study 1).

Fifth, it was hypothesized that the use of smartphones relative to desktop computers when customizing a product leads to an increase in consumers' WTP for a customized product (H_1). To test this hypothesis, the author referred to additional car customization and process data on N = 303,335 car customizations over a time-span of 12 months (09/01/2015-08/31/2016), which were prepared for analysis as outlined in the Method part of this research study. A t-test demonstrated that visitors who accessed the web-based car customization architecture via a smartphone spent significantly more for a customized car compared to visitors who accessed the web-based car customization architecture via a desktop computer ($M_{Smartphone}$ = EUR 19,899.09, $M_{DesktopComputer}$ = EUR 17,479.71, $t(20{,}586) = 15.30$, $p < .001$; see Figure 3-3). The increase in car customization value equaled EUR 2,419.38. Since only 5.95% of visitors used a smartphone to customize their car, a non-parametric test statistic (Wilcoxon-Mann-Whitney test) was performed to control for unequal cell sizes. The results of the Wilcoxon-Mann-Whitney test provided

further evidence for the hypothesized effect of electronic device type usage on car customization value (U = 2,352,113,328, $p < .001$).

3.1.3 Discussion

The results of Study 1 demonstrated that the use of smartphones (in the context of online car customizations) among visitors increased compared to stagnating use of desktop computers. This finding is consistent with prior research and demonstrates that smartphones (relative to desktop computers) represent an increasingly relevant electronic device type for accessing the web (StatCounter 2018).

In consideration of actual car customizations data, the results of this research study showed that the usage of a smartphone vs. desktop computer in a product customization task increased consumers' WTP for a customized product (represented by the increase in monetary customization value) (H_1). Further, the results demonstrated notable differences between electronic device types regarding contextual usage such as time of day of website access (e.g., visitors who accessed the website of the car manufacturer via a desktop computer substantiate the majority audience proportion (75.08%) at 11 a.m. CET, when consumers are usually at work) and referrer websites (e.g., 12.55% of visitors, who accessed the web-based car customization architecture via a smartphone, visited a social network website before entering the web-based car customization architecture).

These results can be interpreted to mean that smartphones, relative to desktop computers, are used in/for more hedonic environments/tasks or in/for social settings/activities. This complies with the findings from a large-scale field study conducted by Google in 2012. In Google's (2012) study, 1,611 participants (i.e., smartphone, desktop computer, and TV users, aged 18-64) with 15,738 media interactions were observed.[21] The results demonstrated the importance of contextual cues regarding electronic device type usage, such as time (i.e., the point in time during the day and amount of time available for a task), goal (i.e., the goal which the consumer wanted to accomplish), location (i.e., the physical location of the consumer), and attitude (i.e., the state of mind of the consumer) (Google

[21] This observation consisted of three components. First, in the qualitative phase, participants were interviewed in-home, filled out mobile text diaries, and participated in an online bulletin board. Second, participants in the study logged their traditional and digital media interactions in a so-called mobile diary. Finally, they filled out an online survey to probe further into observed behaviors (Google 2012).

2012). Further, the results demonstrated that smartphone usage was associated with hedonic and social aspects such as entertainment and communication, whereas desktop computers reminded consumers of work-related aspects such as productivity, task orientation, and a serious attitude (Google 2012). These results highlight the importance of contextual cues in the framework of electronic device type usage.

Even though the current research study has provided initial evidence from field data for the hypothesized effects of electronic device type usage on consumers' customization behavior, it has at least two limitations. First, since consumers choose their respective electronic device type themselves, self-selection mechanisms might affect the observed effects. Second, because of differences in screen size between smartphones and desktop computer monitors (Goh, Chu, and Wu 2015), companies adapt presentation formats (i.e., the structure and visual representation of content) of web-based car customization architectures to fit smartphones in order to display content adequately. This is known as responsive design (Kammer et al. 2010). Responsive design alters the design of the product customization process, which in turn might affect consumers' product customization behavior.

The results from this research study suggest differences in consumers' product customization behavior between the electronic device types that they used (smartphones and desktop computers). Studies 2a, 2b, and 2c were designed to investigate these differences more closely. In particular, they examined the differences between electronic device types (smartphones and desktop computers) from various perspectives to extrapolate a holistic view of the value attributions that consumers have toward their electronic device types. Thus, these studies used distinct research designs (i.e., a qualitative survey in study 2a, field data analysis in 2b, and a rating procedure in 2c) to contribute to a better understanding of these differences.

3.2 Study 2a: Specific Consumer Associations with Electronic Device Types

The aim of Study 2a was to examine associations which individuals might have with certain electronic device types (smartphones and desktop computers) to explore differences in the perception of these electronic device types.

3.2.1 Method

A total of 67 participants (M_{Age} = 34.00, SD_{Age} = 12.13, 44.78% females) recruited from a web-survey panel (Clickworker) were asked the following questions regarding their electronic device type usage, in an online survey: "How would you evaluate the difference in the use of a smartphone versus using a desktop computer"; "What feelings do you associate with your smartphone"; "In which situations and locations do you prefer a smartphone"; and "How would you describe the relationship with your smartphone?" The respective answers were analyzed using the methodological approach of Leithäuser and Volmerg (1988). In particular, prominent statements were identified to extract major propositions. Those prominent statements allow for a deeper understanding of participants' associations with the respective electronic device types. Afterward, the statements were grouped, and these groups were labeled accordingly with an appropriate description.

3.2.2 Results

The names of the formed groups were as follows: "The Smartphone as Social Gateway," "Everywhere-Anytime-Anything," "Work vs. Fun," "Recreation on the Go," "Hate or Love," and "The Extinction of the Desktop Computer." In addition, the following statements highlighted the choice of group names and support the notion that smartphones were viewed inherently different by consumers than desktop computers: *"It is my best friend," "I associate it with being connected to others," "I think my smartphone makes me busy but social," "Desktop computer are better designed for use in a work environment […]," "Smartphones replace the desktop computer more and more," "[…] it's easier to write emails on a desktop computer," "The smartphone is rather for entertainment […]," "I could not imagine working on the smartphone every day," "A disadvantage, is the small screen, which makes certain types of use very tedious in the long run," "Smartphones are sometimes very helpful when traveling, otherwise it's like a toy," "[…] Proper work is only possible with the right hardware," "Smartphones: mobile usage, research quickly. Stronger activity on social networks. Laptop: more complicated work […]," and "Smartphones are more flexible."*

3.2.3 Discussion

The findings of Study 2a demonstrated that participants had more socially-related associations with smartphones than with desktop computers, as exemplified by contextual cues and daily usage behavior. Specifically, participants associated their smartphones mainly with hedonic or social activities (e.g., communicating or engaging with friends and family, sharing content on social websites etc.), while desktop computers elicited more work-related thoughts (e.g., writing emails, performing complex tasks or scheduling meetings). Building on this notion, the author assumes that these perceptional differences, determined by the electronic device type used, may lead to divergent behavioral patterns in the context of consumer product customizations (i.e., the influence of hedonic or social value attribution as related to the respective electronic device type). Although Study 2a illuminated the associations consumers make regarding electronic device types (smartphones and desktop computers), the results did not provide further evidence on the (assumed) effects of used electronic device type on consumer product customization behavior (i.e., increase of consumers' WTP for a customized product and final product feature composition which comprises more socially visible product features for smartphones and desktop computers). Building on this notion, Study 2b examined whether smartphone usage (relative to desktop computer usage) has a positive effect on a final product feature composition which comprises more socially visible product features (H_3).

3.3 Study 2b: Social Visibility of Car Features

Study 2b was designed to examine product feature choices in the context of consumer product customizations contingent on the electronic device type used. In particular, the objective of Study 2b was to test H_3: the use of smartphones vs. desktop computers leads to a final product feature composition which comprises more socially visible product features. The research study is based on data provided by the cooperation partner.

3.3.1 Method

The data set was collected for one particular car model (i.e., a mid-size category) over a time-span of 30 days (11/01/2016-11/30/2016) and contained a total of N = 7,396 unique car customizations performed by consumers who used a smartphone or desktop computer. The web-based car customization architecture for the particular car model allowed

consumers to select from among 235 single car features (e.g., wheels, colors, engines, interior or extras, including the default options).

First, each car feature was rated with respect to the value indicating the social visibility of the car feature (e.g., sport wheels were considered to have high social visibility and an automobile jack to have low social visibility). Therefore, in the first round, each of the 235 car features (e.g., wheels, colors, engines, interior or extras, including the default options) was rated independently by two automotive experts with respect to its social visibility. The rating was conducted under supervision of the author. In the second round, the experts discussed deviations and determined a final rating for each of the 235 car features. Further, the social visibility rating of each car feature was merged with the (single) car features for each of the 7,396 unique car customizations. Next, a social visibility score for each of the 7,396 unique car customizations was calculated by dividing the sum of social visibility ratings by the sum of car features (on a single car customization level).

3.3.2 Results

The results provided support for the hypothesized effect that the use of smartphones vs. desktop computers leads to a final product feature composition which comprises more socially visible product features (H_3). In particular, a t-test confirmed that visitors who accessed the web-based car customization architecture via a smartphone customized cars that include significantly more socially visible car features compared to visitors who accessed the web-based car customization architecture via a desktop computer ($M_{Smartphone}$ = .19, $M_{DesktopComputer}$ = .16, t(296) = -3.12, $p < .01$; see Figure 3-4). Since only 3.79% of visitors used a smartphone to customize their car, a non-parametric test statistic (Wilcoxon-Mann-Whitney test) was performed to control for unequal cell sizes. The results of the Wilcoxon-Mann-Whitney test provided further evidence for the hypothesized effect of electronic device type usage on the final product feature composition, namely, that the use of smartphones vs. desktop computers leads to a final product feature composition which comprises more socially visible product features (U = 871,018, $p < .001$).

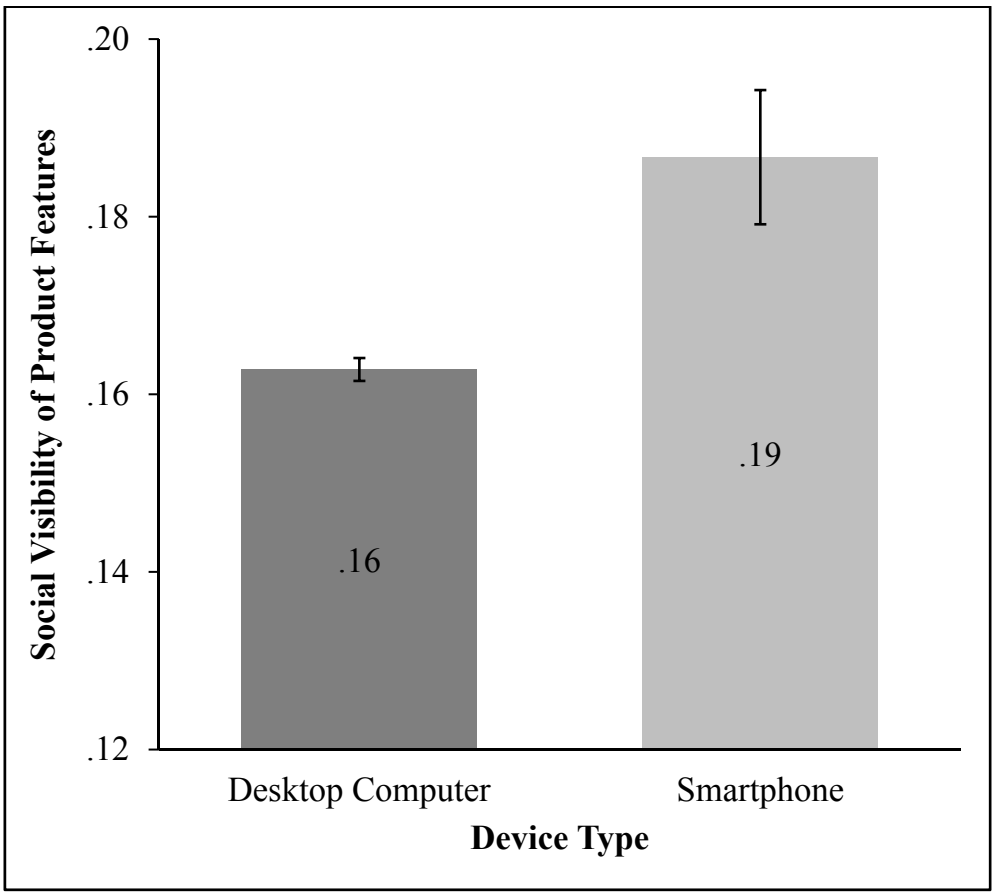


Figure 3-4. Social Visibility of Car Features.

3.3.3 Discussion

The results of Study 2b provided profound evidence for the hypothesized effect of H_3 in a large-scale field environment. The current research study also has potential limitations that are like the limitations of Study 1; namely, self-selection mechanisms and differences in screen size between electronic device types (Gardner 2011).

3.4 Study 2c: Rating of Electronic Device Type Value Attribution

The objective of Study 2c was to develop a more precise understanding of the psychological factors that explain differences in customization behavior between the electronic device types used (smartphones and desktop computers). These psychological factors are expected to illuminate the effect of electronic device type usage on consumers' WTP for a customized product and final product feature composition. Thus, this study addresses H_1 and H_3, even though it is not directly testing them.

3.4.1 Method

A total of 120 participants (M_{Age} = 36.55, SD_{Age} = 11.78, 52.50% females) recruited from a web-survey panel (Amazon's Mechanical Turk) rated both electronic device types (smartphone and desktop computer, each displayed on a picture) in terms of their hedonic/utilitarian value attribution (i.e., whether the electronic device type was perceived as an instrument for pleasurable activities or associated with functional usage) as well as their social value attribution (i.e., whether the electronic device type carried an inherent social meaning). The display order of each electronic device type was randomized. All participants rated the respective electronic device type consecutively and in exchange for monetary compensation.

The "hedonic"/"utilitarian" value was measured by a ten-item semantic differential (five item-pairs for each category of "hedonic"/"utilitarian"), using a seven-point Likert scale as proposed by Voss, Spangenberg, and Grohmann (2003). The question of "How would you describe the electronic device type shown" was asked. For the utilitarian category, choices included "effective"/"ineffective," "helpful"/"unhelpful," "functional"/"not functional," "necessary"/"unnecessary," and "practical"/"impractical." For the hedonic category, choices included "not fun"/"fun," "dull"/"exciting," "not delightful"/"delightful," "not thrilling"/thrilling," and "enjoyable"/"unenjoyable."

In the course of the analysis, one item-pair ("enjoyable"/"unenjoyable") had to be recoded due to reversed coding as proposed by Voss, Spangenberg, and Grohmann (2003). The five hedonic items were aggregated into one index score for the smartphone (α = .84) and one index score for the desktop computer (α = .91). Similarly, the five utilitarian items were aggregated into one index score for the smartphone (α = .87) and one index score for the desktop computer (α = .89).

The social value of the electronic device type was measured by a five item, seven-point scale adopted from Wang et al. (2007) without modification. It included the item, "Please indicate the extent to which you agree or disagree with the adjectives describing the electronic device type" and respondents were asked to address the possible anchors ("interactive," "helpful," "intelligent," "informative," "polite") based on a Likert scale of "strongly disagree" (1) to "strongly agree" (7). The five social items were aggregated into

one index score for the smartphone (α = .78) and one index for the desktop computer (α = .73).

3.4.2 Results

To determine differences in mean responses between electronic device types (smartphone vs. desktop computer), two paired t-tests were performed. The results demonstrated that participants rated a smartphone significantly higher in terms of its hedonic value compared to the hedonic value of a desktop computer ($M_{Smartphone} = 5.49$, $M_{DesktopComputer} = 4.64$, $t(119) = 6.69$, $p < .001$; see Figure 3-5). Moreover, results provided evidence that participants rated a smartphone significantly higher in terms of its social value compared to a desktop computer ($M_{Smartphone} = 5.49$, $M_{DesktopComputer} = 5.23$, $t(119) = 3.12$, $p < .01$; see Figure 3-5). No significant difference between electronic device types was found for the utilitarian value attribution ($M_{Smartphone} = 2.22$, $M_{DesktopComputer} = 2.22$, $t(119) = .02$, $p = .98$).

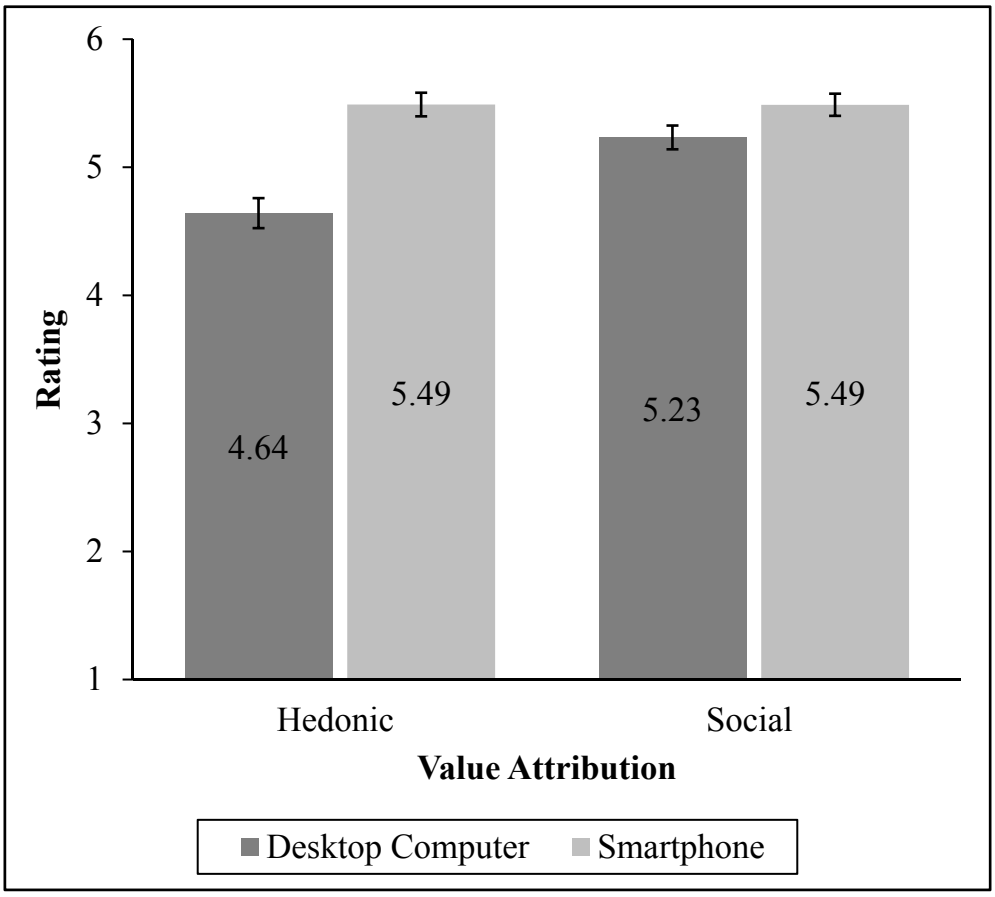


Figure 3-5. Rating of Electronic Device Type Value Attribution.

3.4.3 Discussion

The findings of Study 2c supported the initial hypothesis that there is a significant difference between smartphones and desktop computers regarding hedonic/social value attribution. Therefore, Study 2c contributes to the initial understanding of the underlying psychological mechanisms that cause differences in consumers' customization behavior depending on whether consumers perform such customizations on smartphones or desktop computers. However, before testing the underlying psychological mechanisms for this pattern, Study 3 aimed to provide additional evidence for the hypothesized effects (H_1 and H_3).

3.5 Study 3: Experimental Car Customization Task

The main objective of Study 3 was to verify the previously obtained findings by applying a controlled experimental paradigm (i.e., ruling out potential self-selection mechanisms and presentation format effects). Specifically, the rationale of Study 3 was to test if the usage of smartphones relative to desktop computers promotes consumers' WTP for a customized product (H_1) and that it leads to a final product feature composition which comprises more socially visible product features (H_3).

3.5.1 Method

A total of 100 participants (M_{Age} = 35.53, SD_{Age} = 10.66, 45% females) recruited from a web-survey panel (Amazon's Mechanical Turk) completed this experiment in exchange for monetary compensation. Participants were randomly assigned to a between-subjects experimental design (electronic device type: smartphone vs. desktop computer). The main task of the experiment consisted of a car customization for one particular car model through a self-built, web-based car customization architecture.

During the introduction of the research study, participants were informed that they would participate in a car customization task that aims to understand their car preferences. Subsequently, participants were randomly assigned to one of two experimental conditions (smartphone or desktop computer). In the smartphone condition, participants were allowed to customize a car using a smartphone (i.e., participants used their personal smartphone). In the desktop computer condition, participants were allowed to customize a car using a

desktop computer (i.e., participants used their personal desktop computer). To increase external validity, the car customization process was designed on the basis of the actual car customization process of a particular car model as implemented on the website of a German car manufacturer at the time of the experiment. Hence, participants were able to choose their preferred type of engine out of six versions (e.g., a 2.0 turbo fuel stratified injection (TFSI) quattro), car color out of seven versions (e.g., Manhattan grey metallic), wheels out of seven versions (e.g., 17" cast aluminum alloy wheels in a 5-parallel spoke design), and types of interior out of seven versions (e.g., synthetic leather seat upholstery) as illustrated in the Figure 3-6 exemplar for engines. In addition, participants were able to select 35 additional car features (e.g., a vehicle tool kit and lifting jack, rear seat entertainment, anti-theft alarm system, parking assistance, or sport seats). After finishing the car customization task, pictures of the final customized car and an overview of the car feature choices were presented to the participants as shown in Figure 3-7 (see Appendix for an illustrative representation of the complete customization task). In the introduction to the research study, participants were informed that compensation was only guaranteed if they use the randomly assigned electronic device type for the customization task. This was tracked via the browser uniform resource locator (URL) for each electronic device type (e.g., the operating system of the electronic device type used). Thus, whether the users actually used the assigned electronic device type was validated. After finishing the customization task, participants were debriefed and compensated accordingly.

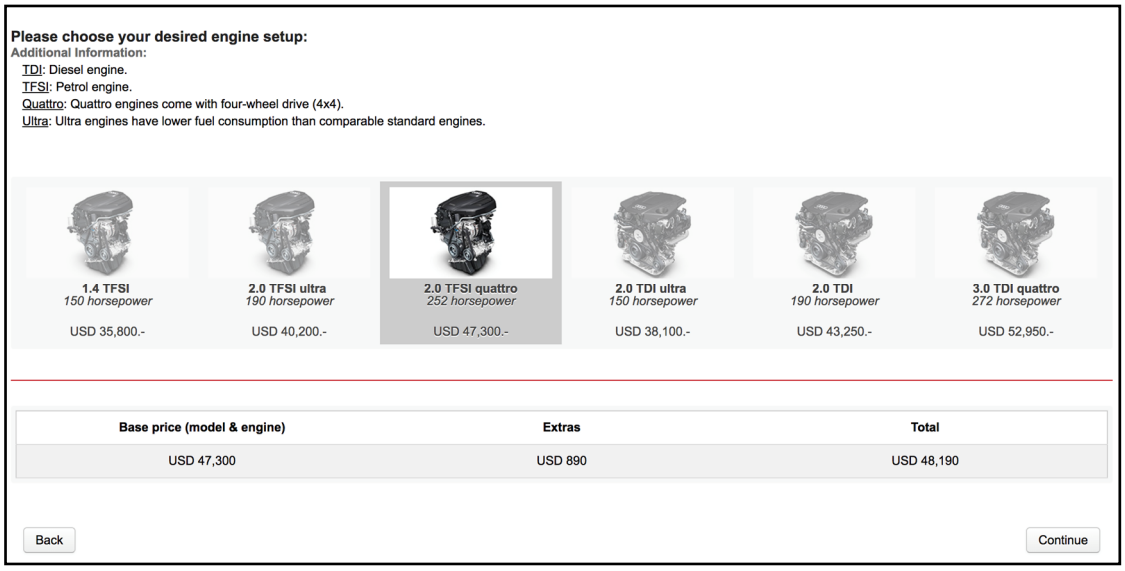


Figure 3-6. Illustration of Engine Selection.

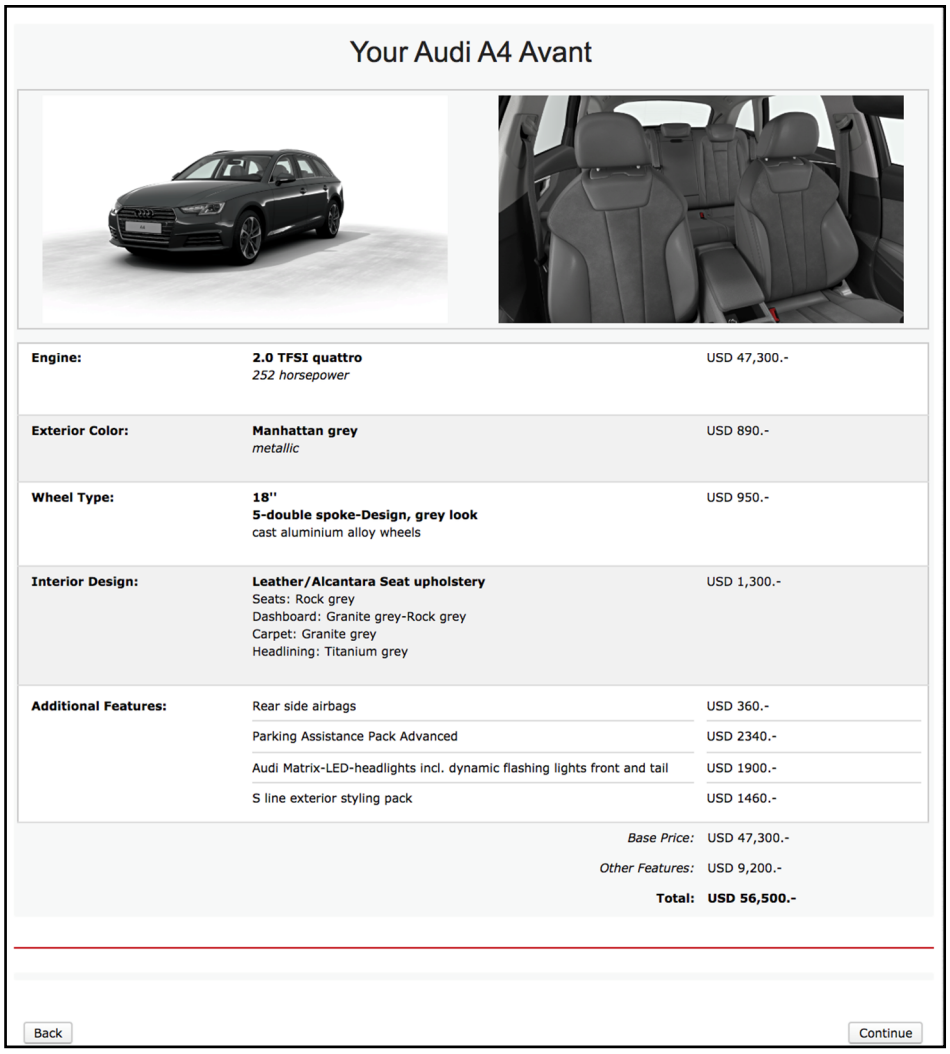


Figure 3-7. Illustration of Customized Car.

3.5.2 Results

In support of hypothesis H_1, the results confirmed that the car customization value was significantly higher for participants who used a smartphone for customizing the car relative to participants who used a desktop computer ($M_{Smartphone}$ = USD 22,150.88, $M_{DesktopComputer}$ = USD 16,414.77, $t(98) = 2.65$, $p < .01$; see Figure 3-8). This equals a difference of USD 5,736.11.

Moreover, the results of Study 3 demonstrated that the use of smartphones vs. desktop computers led to a final product feature composition that comprised more socially visible car features ($M_{Smartphone} = .53$, $M_{DesktopComputer} = .41$, $t(98) = 2.88$, $p < .01$), supporting hypothesis H_3.

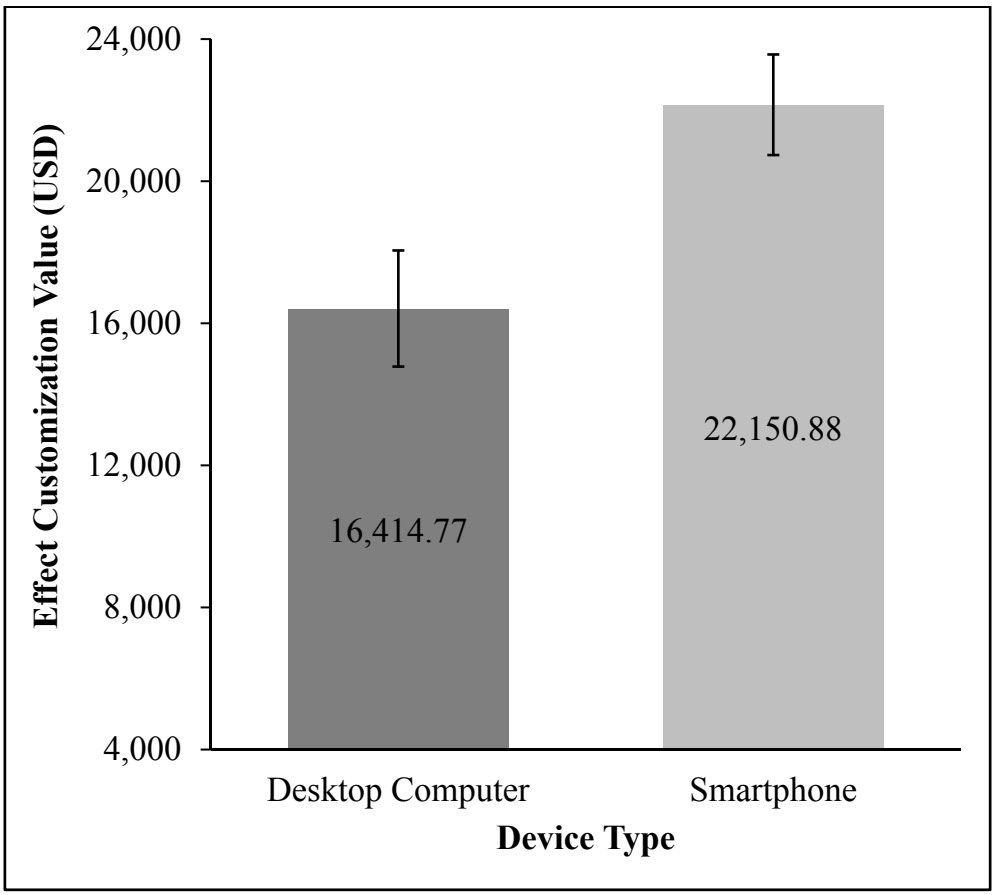


Figure 3-8. Effect Customization Value (Study 3).

3.5.3 Discussion

The results of Study 3 corroborate the findings of Studies 1 and 2b. Specifically, the results demonstrated that the use of a smartphone vs. a desktop computer alters consumers' WTP for a customized product (H_1) and also leads to a final product feature composition that comprises more socially visible product features (H_3).

While the results of Studies 1 and 2b were potentially confounded by self-selection mechanisms and presentation format issues of the web-based car customization architecture, the present research study controls for these aspects by randomly assigning participants to a particular condition (either a smartphone or desktop computer) and by presenting the same presentation format of the web-based car customization architecture through a self-built, web-based car customization architecture independent of the respective conditions.

However, the hypothesized effect of hedonic value attribution on consumers' WTP for a customized product (H_2) and the hypothesized effect of social value attribution on the final

product feature composition which comprises more socially visible product features (H_4) have yet to be tested. Therefore Study 4 aimed to test the respective hypotheses H_2 and H_4 in an experimental setting. After having shown robust effects across different studies, including large-scale field data analysis and an experimental setting, the author designed Study 4 to investigate the underlying psychological mechanisms.

3.6 Study 4: Experimental Car Customization Task (Mediation Analysis)

The evidence presented thus far has supported the assumption that the usage of smartphones relative to desktop computers promotes consumers' WTP for a customized product (H_1) and that it leads to a final product feature composition which comprises more socially visible product features (H_3). The rationale of Study 4 was to examine the underlying psychological mechanisms that were hypothesized to explain those effects (H_2 and H_4). Specifically, the rationale of Study 4 was to examine whether hedonic value attribution increases consumers' WTP for a customized product (H_2) and whether social value attribution positively affects a final product feature composition which comprises more socially visible product features (H_4), if a smartphone was used instead of a desktop computer in the context of a consumer product customization.

3.6.1 Method

The experimental procedure of Study 4 corresponded to the experimental procedure of Study 3. A total of 106 participants ($M_{Age} = 33.44$, $SD_{Age} = 9.91$, 40.57% females) recruited from a web-survey panel (Amazon's Mechanical Turk) completed this experiment in exchange for monetary compensation. Participants were again randomly assigned to a between-subjects experimental design (electronic device type: smartphone vs. desktop computer). Like Study 3, the main task of the experiment consisted of a car customization for one particular car model through a self-built, web-based car customization architecture (see Appendix for an illustrative representation of the complete customization task).

During the introduction of the research study participants were informed that they were to participate in a car customization task that aimed to understand their car preferences, following the same procedure used in Study 3. Subsequently, participants were randomly assigned to one of two experimental conditions (smartphone or desktop computer). Under

the smartphone condition, participants were allowed to customize a car using a smartphone (i.e., participants used their personal smartphone). In the desktop computer condition, participants were allowed to customize a car using a desktop computer (i.e., participants used their personal desktop computer). To increase external validity, the car customization process was designed on the basis of the actual car customization process of a particular car model as implemented on the website of the cooperation partner at the time of the experiment. Hence, participants were able to choose their preferred type of engine out of six versions, car color out of seven versions, wheels out of seven versions, and types of interior out of seven versions. In addition, participants were able to select 35 additional car features (see Study 3 for examples). After finishing the car customization task, pictures of the final customized car and an overview of the car feature choices were presented to the participants.

As occurred in Study 3, participants were informed in the introduction of the research study that compensation was only guaranteed if they used the randomly assigned electronic device type for the customization task. This was tracked and validated via the browser URL for each electronic device type (e.g. the operating system of the electronic device type used). After finishing the customization task, participants were debriefed and compensated accordingly.

Additionally, either a photograph of a smartphone (smartphone condition) or a photograph of a desktop computer (desktop computer condition) was presented to the participants and they rated the respective electronic device type according to its social value and hedonic value following the work of Wang et al. (2007) and Voss, Spangenberg, and Grohmann (2003), in accordance with Study 2c. The five hedonic items were aggregated into one index ($\alpha = .89$) and the five social items were aggregated into one index ($\alpha = .82$) to measure the respective value attribution.

3.6.2 Results

Like the results of Study 3, the results of Study 4 confirmed that the car customization value was significantly higher when participants used a smartphone for customizing the car relative to participants who used a desktop computer ($M_{Smartphone}$ = USD 21,270.71, $M_{DesktopComputer}$ = USD 14,623.70, $t(104) = 3.11$, $p < .01$: see Figure 3-9). Thus, the results yielded a difference of USD 6,647.01. Further, the use of smartphones vs. desktop

computers led to a final product feature composition that comprised more socially visible car features ($M_{Smartphone}$ = .50, $M_{DesktopComputer}$ = .41, t(104) = 2.14, $p < .05$).

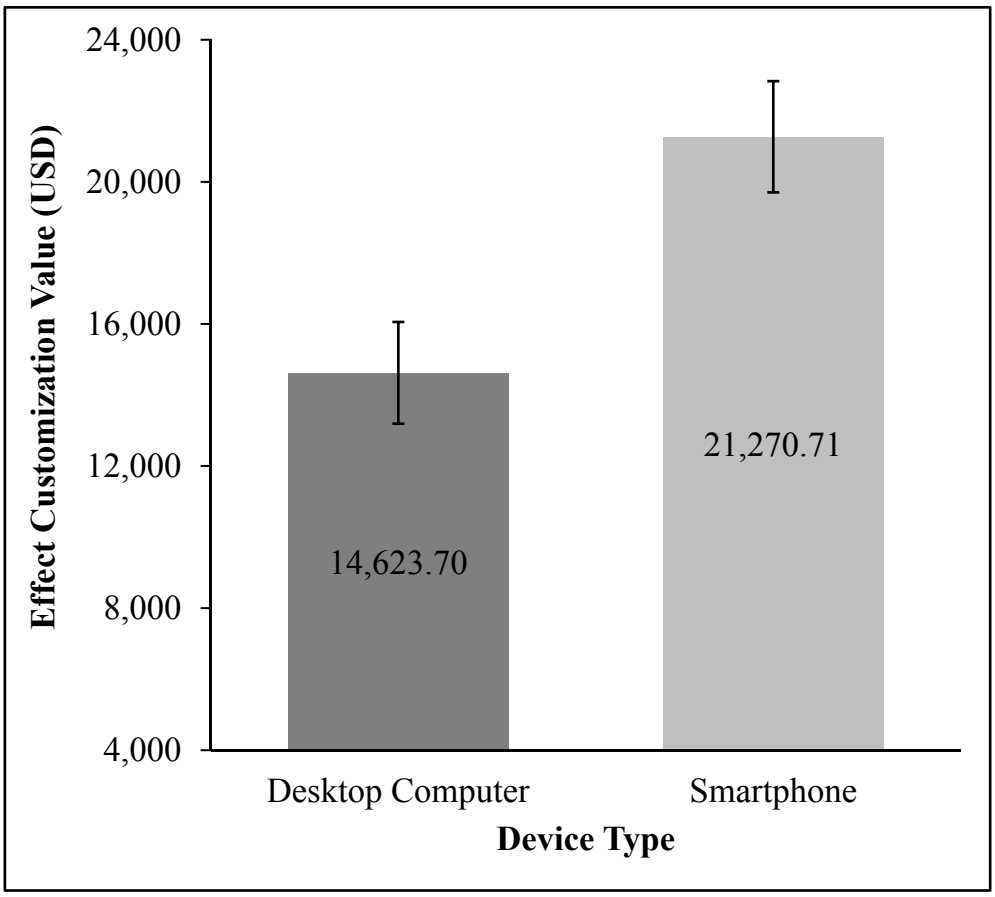


Figure 3-9. Effect Customization Value (Study 4).

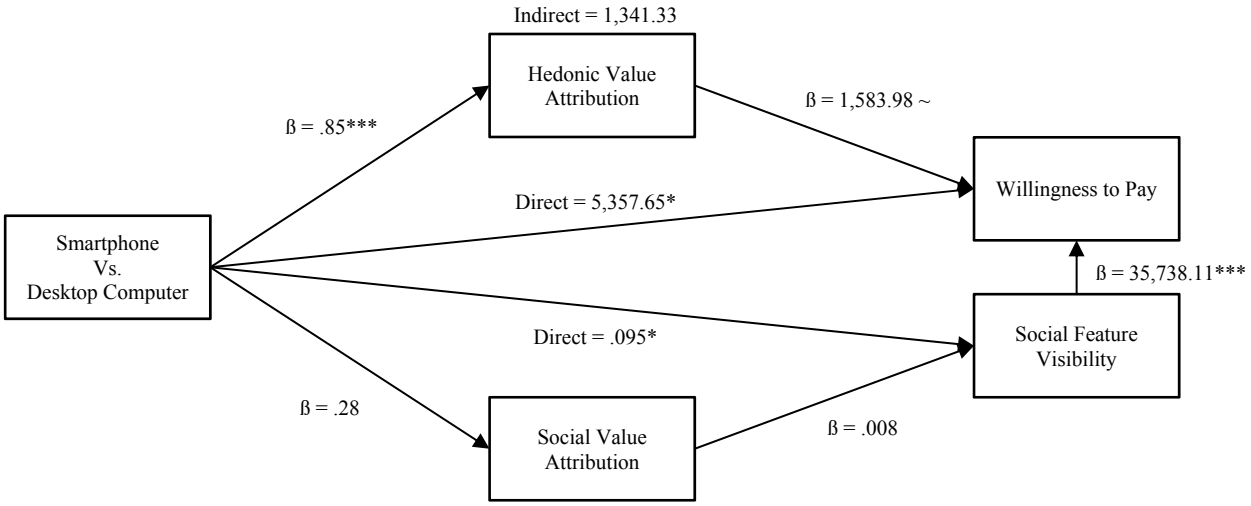
To test the hypothesized conceptual model (H_1-H_4) and the specific influence of electronic device type usage on consumer product customization behavior (whether both hedonic value attribution and social value attribution mediate the positive effect of smartphones (vs. desktop computers) on WTP for a customized product and choice of social visible product features), the author estimated a multiple mediation model (model 4; Hayes 2013) with bootstrapped estimates with 5,000 resamples (Preacher and Hayes 2008). The results are described below.

First, both hypothesized effects for H_1 and H_3 were statistically significant. In particular, support for hypothesis H_1 was provided through a significant difference in the final customization value between the electronic device types that consumers used to customize the car; the car customization value was significantly higher when participants used a smartphone for customizing the car relative to participants who used a desktop computer

($ß_{TotalWillingnessToPay}$ = 6,698.99, t(102) = 3.06, $p < .01$). Further, the use of smartphones vs. desktop computers led to a final product feature composition that comprised more socially visible car features ($ß_{TotalFeatureVisibility}$ = .097, t(102) = 2.12, $p < .05$), as predicted by H_3.

Second, the results of Study 4 showed that participants in the smartphone condition attributed significantly more hedonic value to their electronic device type relative to consumers in the desktop computer condition ($ß_{SmartphoneVsDesktopComputerHedonic}$ = .85, t(102) = 3.67, $p < .001$), and as a consequence of this greater value attribution, a significantly higher car customization value was demonstrated ($ß_{HedonicAttribution}$ = 1,583.98, t(101) = 1.70, $p < .1$). Further, an indirect effect for consumers in the smartphone condition was observed ($CI_{95\%HedonicAttribution}$ of indirect effect [32.08; 3,294.23]). This indirect effect was significantly above zero and led to a reduction in the direct effect ($ß_{DirectHedonic}$ = 5,357.65, t(102) = 2.32, $p < .05$); it thus indicates a partial mediation as hypothesized in H_2.

Third, no significant difference was observed between participants in either condition (smartphone and desktop computer) regarding social value attribution to the electronic device type ($ß_{SmartphoneVsDesktopComputerSocial}$ = .28, t(102) = 1.40, $p = .17$), and social value attribution to the electronic device type had no significant effect on the final product feature composition ($ß_{SocialAttribution}$ = .008, t(101) = .37, $p = .71$). Therefore, and in opposition to the hypothesized indirect effect of social value attribution to the electronic device type on the final product feature composition (H_4), no significant evidence was found ($CI_{95\%SocialAttribution}$ of indirect effect [-.01; .03]). Hence, there was no reduction in the direct effect ($ß_{DirectSocial}$ = .095, t(102) = 2.04, $p < .05$). Fourth, as an additional finding, results showed that an increase of social feature visibility led to an increase in the customization value ($ß_{SocialFeatureVisibility}$ = 35,738.11, t(105) = 10.82, $p < .001$). Figure 3-10 depicts the results of the mediation analysis.



Note: *** p < .001, ** p < .01, * p < .05, ~ p < .10
N =106

Figure 3-10. Results of the Mediation Analysis.

3.6.3 Discussion

The first five studies (1, 2a, 2b, 2c and 3) provided profound evidence that the usage of smartphones relative to usage of desktop computers promoted consumers' WTP for a customized product (H_1) and that it led to a final product feature composition which comprised more socially visible product features (H_3). Building upon these empirical findings, Study 4 confirmed and extended these results by demonstrating the underlying psychological mechanisms of consumers' behaviors. In particular, hedonic value attribution to a smartphone positively affects consumers' WTP for a customized product (H_2). However, the results did not provide further evidence that social value attribution toward smartphones leads to a final product feature composition which comprises more socially visible product features as hypothesized (H_4). Potential reasons for that shortcoming are discussed below.

First, it is possible that a moderator which was not considered in the experimental design impacted the effect of electronic device type usage on social value attribution toward the device. Thus, future studies should be conducted to rule out alternative explanations. Second, unlike to the results of Study 2c, where participants solely had to rate the social value attribution of the electronic device type, the customization task in this study (Study 4) might have affected the social value attribution toward the device type since the participants had to rate the electronic device type following the customization task.

Therefore, the measure of social value attribution results of Study 4 might be distorted based on the preceding customization task.

4 General Discussion

The aim of this dissertation has been threefold. First, the main goal of the present research was to contribute to a better understanding of differences in consumer product customization behavior (i.e., consumers' WTP for a customized product and final product feature composition) depending on the electronic device type (smartphone vs. desktop computer). Second, the current research explained which underlying psychological mechanisms affect consumers' WTP for a customized product and final product feature composition based on electronic device type used to make the customization (smartphone vs. desktop computer). Third, it suggests how firms can actively use the provided findings to influence consumer product customization behavior, depending on the specific electronic device type used.

This chapter begins with a discussion of the theoretical and empirical findings of this dissertation. Building upon these findings, an outline of the theoretical and managerial contributions follows. Potential limitations of the experimental examination are addressed and finally future research directions are presented.

4.1 Overall Findings

In addressing the aforementioned research goals of this dissertation, the theoretical background chapter (Chapter 2) illuminated the current state of research in the fields of consumer product customization and smartphones in consumer research. Further, potential research gaps were identified in sections 2.1 and 2.2. Notably, to the best of the author's knowledge, research in the field of consumer product customization had not addressed the usage of smartphones in web-based consumer product customization architectures. In addition, there was no evidence regarding hedonic and social value attribution toward smartphones in the field of consumer research.

Based on this review, the author discussed hedonic and social value attribution toward smartphones in sections 2.3 and 2.4 and elaborated on those findings in the field of consumer behavior in product customization environments. Based on those considerations, a set of research hypotheses was developed.

First, prior research regarding smartphone usage behavior provided evidence that primarily hedonic activities are performed with a smartphone (e.g., Balasubramanian, Peterson, and Jarvenpaa 2002; Larivière et al. 2013; Nysveen, Pedersen, and Thorbjørnsen 2005; Shankar and Balasubramanian 2009) and thus, the subsequent hedonic value attribution to the smartphone was expected (section 2.3). Further, it was postulated that the usage of a smartphone (vs. a desktop computer) in a web-based consumer product customization architecture would result in a higher WTP for the self-designed product due to the hedonic value attribution toward the smartphone.

Second, it was further argued that consumers attribute some sort of social value to their smartphone, due to the personal nature of the electronic device type (i.e., consumers perceive smartphones more as personal objects than as functional gadgets such as desktop computers; e.g., Bacile, Ye, and Swilley 2014; Danaher et al. 2015; Goh, Chu, and Wu 2015; Jung 2014; Larivière et al. 2013). For example, consumers' social connections and emotional relationships are fostered more often via their smartphones than via their desktop computers (e.g., Bayer, Campbell, and Ling 2016; Oulasvirta et al. 2012; Vincent 2006; YouGov 2017). Building upon this understanding, it was suggested that the linking of social value attribution and a customizable product would affect the final product feature composition of the customizable product.

Overall, the results in this dissertation have demonstrated the differences in electronic device type usage behavior and, therefore, contextual influences on the consumer product customization processes. The novel research question of examining electronic device type usage (smartphone vs. desktop computer) and its downstream consequences when entering a web-based consumer product customization architecture was posed. Thereby, this research presented a new perspective on consumers' WTP for a customized product and final product feature composition depending on the electronic device type used (smartphone vs. desktop computer).

Building upon this understanding, Chapter 3 of the current research presented six empirical studies to test the hypotheses presented in sections 2.3 and 2.4. Lamberton and Stephen (2016) proposed that a combination of big data analyses and experimental settings which enable a consumer-level analysis is the best way to generate an in-depth understanding of consumer behavior in the field of mobile devices. Thus, the previously outlined studies in Chapter 3 followed that recommendation.

Study 1 used large-scale car customization data (i.e., a total of N = 303,335 car customizations) provided by the cooperation partner, to test hypothesis (H_1); that the use of smartphones vs. desktop computers increases consumers' WTP for a customized product. Results of Study 1 revealed that visitors who accessed the web-based car customization architecture via a smartphone spent significantly more for a customized car compared to visitors who accessed the web-based car customization architecture via a desktop computer. Thus, the results provided in Study 1 supported Hypothesis (H_1).

In addition, general differences between electronic device types (i.e., smartphones vs. desktop computers) were examined in Study 1, using online customization data. Notably, the analysis of N = 10,456,875 unique customizations, revealed that visitors who accessed the web-based car customization architecture via a smartphone, spent on average EUR 681 more for the customized car compared to visitors who accessed the web-based car customization architecture via a desktop computer.

Study 2a examined differences in the perception of electronic device types (smartphones and desktop computers) among consumers. Results indicated that contextual cues and daily usage behavior form specific associations of electronic device types. Interestingly, individuals associated their smartphones primarily with hedonic or social activities (e.g., communicating or engaging with friends and family, sharing content on social websites etc.), while desktop computers elicited more work-related activities (e.g., writing emails, performing complex tasks, or scheduling meetings).

Study 2b used large-scale car customization data (i.e., N = 7,396 unique car customizations) to examine product feature choices in the context of consumer product customizations contingent on the electronic device type used to customize a car. Results provided evidence for the hypothesized effect (H_3); that the use of smartphones vs. desktop computers leads to a final product feature composition which comprises more socially visible product features.

Study 2c contributed to the understanding of the underlying psychological mechanisms causing differences in consumers' customization behavior, depending on electronic device type usage (smartphones and desktop computers). Results of Study 2c indicated that there is a significant difference between smartphones and desktop computers regarding hedonic and social value attribution. In particular, participants rated a smartphone significantly

higher with respect to its hedonic and social value compared to a desktop computer. Findings of Study 2c (i.e., constructs to measure the hedonic and social value attribution of electronic device types) were further used in Study 4 to test hypotheses H_2 and H_4.

Study 3 was conducted to verify the previously obtained findings of Studies 1 and 2b by applying a controlled experimental paradigm. Thereby, participants were randomly assigned to a between-subjects experimental design (electronic device type: smartphone vs. desktop computer) to customize a car. Results indicated that the use of a smartphone vs. desktop computer alters consumers' WTP for a customized product, supporting H_1. Further, results provided evidence that the use of a smartphone vs. desktop computer leads to a final product feature composition which comprises more socially visible product features, supporting H_3.

Study 4 was designed to test the hypothesized conceptual model (H_1-H_4). Participants were again randomly assigned to a between-subjects experimental design (electronic device type: smartphone vs. desktop computer) to customize a car. Results indicated that the increase of WTP was significantly higher for the customized car (H_1) and the final product feature composition comprised more socially visible car features (H_3) when a smartphone was used (vs. a desktop computer) to customize the car. Thus, these findings were consistent with the results provided in Study 3 and supported the hypothesized effects (H_1 and H_3). Further, results of Study 4 contributed to the understanding of the underlying psychological mechanisms that were hypothesized to explain the differences in customization behavior between device types (H_2 and H_4). Notably, results of Study 4 indicated that for consumers using a smartphone rather than a desktop computer, hedonic value attribution toward the electronic device type increases consumers' WTP for a customized product (H_2). However, no empirical evidence could be found to support the hypothesis that social value attribution positively affects the final product feature composition which comprises more socially visible product features (H_4) when consumers use a smartphone compared to those who use a desktop computer to customize a product. The managerial implications of these results will be discussed in section 4.3.

4.2 Theoretical Contributions

This dissertation has attempted to elaborate on differences in consumer product customization behavior depending on the electronic device type used and the subsequent

effects on consumers' WTP for a self-customized product as well as the actual final product feature composition. Thus, this research contributes to the field of human-computer interaction in marketing and research on consumer product customization in several ways. These are described below.

First, the current findings contribute to the field of human-computer interaction in marketing (e.g., Brasel and Gips 2014; Hildebrand, Levav, and Herrmann 2015; Ko, Kim, and Lee 2009; Kwon and Lennon 2009; Novak, Hoffman, and Yung 2000; Sarker and Wells 2003; Shen, Zhang, and Krishna 2016). In particular, prior research on consumer decision-making in computer-mediated environments primarily focused on website appeal, content, or usability aspects (Brasel and Gips 2014; Hildebrand, Levav, and Herrmann 2015; Kwon and Lennon 2009; Shen, Zhang, and Krishna 2016), technology adoption (Ko, Kim, and Lee 2009, Sarker and Wells 2003), or website navigation (Novak, Hoffman, and Yung 2000). Notably, fundamental research regarding electronic device type usage (e.g., Brasel and Gips 2014; Hildebrand, Levav, and Herrmann 2015; Shen, Zhang, and Krishna 2016) examined the influence of touchscreens (vs. non-touchscreens) on consumers' decision-making in computer-mediated environments. It has been argued that physically touching the screen (vs. not touching a screen) increases feelings of ownership and endowment of the product that is displayed (Brasel and Gips 2014), imagining product interaction (Shen, Zhang, and Krishna 2016), and the experience of product consumption (Hildebrand, Levav, and Herrmann 2015). This dissertation has extended prior research, by showing that the usage of a smartphone (vs. a desktop computer) leads to an increase of hedonic value attribution toward the smartphone. In turn, it demonstrated that a higher hedonic value attribution toward the smartphone leads to an increase consumers' WTP for a customized product. This combination of findings provides support for the conceptual premise that consumers' activities performed via their smartphone ultimately influence customization behavior. Prior research focused primarily on the impact of technical, electronic device-specific characteristics (i.e., touch vs. non-touch input modalities) on consumers' decision-making. However, the current research also considered contextual factors of electronic device type usage by providing evidence that consumers' hedonic value attribution toward the electronic device type affects their decision-making. Thus, the findings of this dissertation contribute a more detailed understanding of decision-making in computer-mediated environments.

Second, this dissertation has advanced the understanding of how consumers customize products via web-based consumer product customization architectures (e.g., Ansari and Mela 2003; Franke and Piller 2004; Franke, Schreier, and Kaiser 2010; Norton, Mochon, and Ariely 2012). Prior research in the field of consumer product customizations has primarily examined characteristics of consumer product customization architectures (i.e., preference fit of customized products (e.g., Dellaert and Stremersch 2005; Franke and Piller 2004)), design effort in the customization process (e.g., Randall, Terwiesch, and Ulrich 2007; von Hippel 2001), feelings of ownership and accomplishment (e.g., Franke, Schreier, and Kaiser 2010; Troye and Supphellen 2012), as well as instruments to optimize the customization process such as the implementation of default options (e.g., Hildebrand, Häubl, and Herrmann 2014). Thus, prior research primarily examined the technological aspects of customization architectures (e.g., Hildebrand, Häubl, and Herrmann 2014) and feelings evoked by the customization process (e.g., Franke, Schreier, and Kaiser 2010; Troye and Supphellen 2012). Notably, Hildebrand, Häubl, and Herrmann (2014) argued that altering the customization architecture by implementation of pre-defined default options leads to a reduction in complexity of the customization process (section 2.1.3 for a review). However, Franke, Schreier, and Kaiser (2010) as well as Troye and Supphellen (2012) focused largely on the feelings of pride and accomplishment perceived by the individual when he/she was aware of being the creator of a self-customized product (see section 2.1.2.3 for a review). Unlike this previous research on consumer product customization, the current work has emphasized the importance of the electronic device type that is used to access a web-based consumer product customization architecture. The previously outlined findings in Chapter 3 provided evidence that the usage of a smartphone (vs. a desktop computer) increases consumers' WTP for a customized product and that this leads to a final product feature composition which comprises more socially visible product features. Thus, this dissertation has further enhanced the understanding of electronic device type usage and its influence on consumer decision-making.

Altogether, this dissertation has indicated that exposure to a certain electronic device type (a smartphone vs. a desktop computer) to enter a web-based consumer product customization architecture significantly affects consumers' WTP for a self-customized product as well as the actual final product feature composition. Moreover, the current results have provided pioneering insights into the understanding of the psychological mechanisms underlying the decisions made by consumers during a customization process

(i.e., hedonic value attribution toward smartphones). To the best of the author's knowledge, the consideration of smartphones in web-based consumer product customization architectures had not yet been investigated yet in the broad field of consumer research. Thus, this research endeavor has provided an important theoretical contribution to the consumer research literature.

4.3 Managerial Contributions

Besides its theoretical contributions, this research has valuable implications for managers across functions and industries seeking to optimize web-based consumer product customization architectures. Each of these are described below.

First, the main implication for practitioners is that there are contextual cues (i.e., the choice of electronic device type) that influence consumer decision-making regarding WTP and product choices and are not necessarily controllable by the company. The author assumes that if practitioners use the results of this dissertation to better understand and distinguish consumers' device-specific usage behavior, it might then be possible for them to influence consumer product customization behavior by restructuring website content in a reasonable way (i.e., without adjusting the entire infrastructure). This would be contingent on the device type used to access the customization architecture, would subsequently increase consumers' WTP, and would also promote choice of specific product features. In particular, companies can improve onsite targeting and promotion of relevant products to their consumers based on the respective electronic device type used by each consumer. In consideration of the example of a premium car manufacturer, it would be beneficial to adapt content structures of car features presented during an online car customization process, based on the corresponding electronic device type which is used to customize a car. Specifically, because the smartphone user attributes more hedonic value to the smartphone, the smartphone user should receive more hedonic product feature descriptions; the implementation of hedonic functions such as videos or music may also be beneficial. Empirical evidence that supports this notion was provided by Scarpi (2012), who stated that "The hedonic orientation emerges as more profitable than does the utilitarian orientation on the Internet, so e-tailers should create their Web sites in such a way as to enhance their hedonic potential […] A possible strategy could be to create a Web site with different levels of hedonic stimulation to cater for different browsers" (p.

64). Therefore, exploiting sensory functions (i.e., colors, music, and videos) to seek consumers with a hedonic orientation (i.e., consumers using a smartphone to customize a product) might lead to an increase in the current customer base (Scarpi 2012). According to Scarpi (2012), consumers' enjoyment of the Internet subsequently leads to higher profits for the retail company due to an increase in consumer spending through unplanned purchases.

Second, the results of this research have indicated that in terms of a major consumer product customization outcome (i.e., customization value) outcomes from smartphone customizations are superior to those from desktop computers. Notably, as stated in section 2.2.3, mobile devices already accounted for 58.9% or USD 1.36 trillion of total e-commerce sales worldwide and market share is projected to increase even further to 72.9% or USD 3.56 trillion in 2021 (eMarketer 2018). Another valuable insight from secondary data provided by comScore (2012) indicates that shoppers using a smartphone have more buying power compared to shoppers using a desktop computer when buying from online retailers. According to comScore (2012), 32.6% of all smartphone users (i.e., almost 86 million users) visiting online retailer websites in the U.S. had a high household income at over USD 100,000 compared to 23.8% of all desktop computer users in the same household income range. In contrast, only 10.8% of all smartphone users visiting online retailer websites in the U.S. had a household income between USD 40,000 and USD 60,000 compared to 22.2% of all desktop computer users in the same household income range[22] (comScore 2012). These findings have important strategic consequences for companies and might encourage practitioners to broaden their understanding and conceptualization of a consumer journey by examining the presence of potential context effects (such as choice of electronic device type) on consumers' product customizations, as also suggested by Herrmann et al. (2015). Hence, convincing the current customer base to perform an electronic device type switch from desktop computers to smartphones might be beneficial for companies.

Third, the author expects that current results might be applicable for additional industries beyond the automotive industry in the context of consumer product customizations. Healthcare applications, among others, yield great potential for the use of generated

[22] The study was conducted in the U.S. market and contains user data of July 2012 (comScore 2012).

insights from this research since there is an emerging field of "mobile health" (i.e., mHealth) applications such as those for tracking running training or daily calorie intake. Data from PricewaterhouseCoopers highlights the potential of this industry by stating that worldwide revenue of mHealth from 2013 to 2017 increased by 411.11% from USD 4.5 billion up to USD 23 billion (Vishwanath et al. 2012). One possible application of the results provided in this dissertation could be that patients be encouraged to compose their workout plan or medicine schedule differently when using a certain electronic device type. Specifically, the portability of smartphones allows consumers to use mHealth services regardless of their physical location and might enhance usage frequency due to the accessibility of the service. Hence, mobile-driven consumer product customization behavior in the context of healthcare and promoting healthcare applications for consumers might be a valuable field to explore and understand. The effects observed and reported in this dissertation lead to the conclusion that it is of the utmost importance that companies further investigate the possibility of optimizing consumer product customization architectures with regard to device-specific usage behavior.

4.4 Limitations

The results of this dissertation have several limitations that are enumerated and discussed in this section.

First, since the two experimental studies (Study 3 and 4) were conducted as online surveys on Amazon Mechanical Turk, issues regarding data quality might result. The participants of these experimental studies included U.S. residents who only shared similar demographical characteristics (e.g., income and education) because of the regional popularity of the Mechanical Turk service provider. Thus, derived findings might not be representative and therefore potentially reduce their generalizability. Moreover, conducting experimental studies (Study 3 and 4) in an online setting through a service provider (i.e., Mechanical Turk) limited control over participants compared to a laboratory experimental setting (Chandler, Mueller, and Paolacci 2014; Chandler and Shapiro 2016; Pham 2013). Specifically, Chandler, Mueller, and Paolacci (2014) stated that contextual factors such as perceived anonymity or financial motivations might be reasons for Mechanical Turk workers (i.e., study participants) to invest little effort into the accuracy of completing tasks during the study. In addition, building upon Chandler, Mueller, and

Paolacci (2014), Pham (2013) suggested that "[…] there is growing evidence of increased MTurk sophistication in seeing through and 'gaming' social science studies, raising issues about the validity of the data provided" (p. 420). Thus, future studies should consider subjects from diverse cultural backgrounds and it is suggested that such studies be conducted in a laboratory experimental setting to examine whether the results of this dissertation remain applicable.

In addition, this research did not broach the issue of how and to what extent the results provided in this dissertation apply in contexts other than car customizations. To further support the generalizability of the effect of electronic device type (i.e., smartphone vs. desktop computer) usage on consumers' WTP and product feature composition in a customization context, further studies should be conducted in a product customization setting with products and services from various other categories. This approach has already been applied successfully by various researchers in the broader field of consumer product customizations (e.g., Franke, Schreier, and Kaiser 2010; Hildebrand, Häubl, and Herrmann 2014).

Second, the research at hand did not rule out the influence of touch (i.e., subjects touching the smartphone screen during the customization process). Prior research (e.g., Brasel and Gips 2014; Hildebrand, Levav, and Herrmann 2015; Shen, Zhang, and Krishna 2016) provided evidence that touching the screen of an electronic device type (i.e., a tablet) subsequently influences product evaluation as well as consumers' decision-making. However, results of Study 3 and Study 4 might have been affected since subjects were touching the smartphone screen to customize the car. Thus, introducing an experimental design with a control group (i.e., subjects who customize via smartphone must use a touch pen in order to prevent touching the screen with their fingers) might isolate the potential boundary of touching the smartphone screen.

4.5 Future Research

The results presented in this dissertation have provided empirical evidence for the effect of electronic device type usage on consumers' decisions during product customizations. Further, the previously outlined findings of the current research present a variety of opportunities for new research endeavors. In the following section, two research opportunities are suggested to other researchers in the field of consumer research: the

manipulation of product feature descriptions for products customized via smartphones and the investigation of physical as well as psychological proximity in the context of electronic device type usage.

4.5.1 Manipulation of Product Feature Descriptions

Future research might reveal that previously derived findings regarding the effect of device type (smartphone vs. desktop computer) usage on consumers' WTP and final product feature composition can be used to increase company revenues by manipulating customization product feature descriptions. In particular, it is proposed that standard product features be described in the context of a product customization setting with more hedonic associated language. Specifically, depending on the device type (a smartphone vs. a desktop computer) which is used to access the product customization architecture, altered product feature descriptions will be displayed to the consumer. For example, instead of showing the standard product feature description "2.0 TFSI quattro with 252 horsepower" (engine), it is proposed that if a smartphone is used to access the web-based product customization architecture the product feature description be modified to read: "this remarkably powerful 2.0 TFSI quattro with 252 horsepower will let you feel the excitement and adrenaline of a professional race car driver." In the context of this dissertation it was discovered that smartphones are perceived as hedonic objects compared to desktop computers (see section 2.2 for a review). Thus, it is expected that manipulating product feature descriptions (i.e., smartphone users receive hedonic feature descriptions and desktop users receive standard feature descriptions) might direct consumers' feature choices (i.e., smartphone users may choose more hedonic product features) during a product customization task. In turn, this might result in a higher WTP (i.e., hedonic features usually had a higher monetary value in the context of this dissertation) for the self-customized product. It is expected that consumers' hedonic associations with their smartphones can be triggered by a hedonic description of product features in the context of a customization task and can subsequently influence consumers' choice behavior.

This approach is inspired by research of Polak et al. (2008) who found that more hedonic product feature descriptions (vs. standard descriptions) led to a higher WTP and, thus, increased company revenues. Polak et al. (2008) manipulated product feature descriptions of an audio system in the case of a car customization by describing the audio system with

hedonic language (e.g., a unique high-end sound experience) compared to describing the audio system with standard language where merely the technical aspects of the audio system are presented (e.g., an integrated CD player). Moreover, since smartphones are perceived as hedonic objects compared to desktop computers, it is expected that a manipulation of product feature descriptions that is contingent on the electronic device type used to customize a product, might lead to an effect similar to that observed by Polak et al. (2008). In particular, displaying more hedonic product feature descriptions for smartphone users in the context of a product customization task might lead to an increased selection of hedonic features which, in turn, could result in a higher WTP for the self-customized product.

Ashraf and Thongpapanl (2015) provided similar evidence that hedonic product feature descriptions in the case of purchasing a laptop (e.g., "It offers a groundbreaking HD+ Display (5 million pixels in 15-inch screen, equally impressive 2,880-by-1,800 resolution, and a 178-degree view of everything on the screen) that reduces glare while maintaining incredible color and quality" (p. 23)) relative to standard product feature descriptions (e.g., "It offers HD+ Display" (p. 23)) led to a higher purchase intention. Specifically, they drew on prominent regulatory focus and regulatory fit theories by Higgins (1997) (see also Higgins 1987; Higgins et al. 1994), to show that consumers with a promotion focus (i.e., "[…] concerned with advancement, growth, accomplishment" Crowe and Higgins 1997, p. 120) purchased a laptop which was advertised with emphasis on hedonic product feature descriptions as previously outlined in the examples. Thus, empirical findings suggest that manipulating product feature descriptions (i.e., describing features with more hedonic language) significantly increased purchase intention. Applying this approach in a product customization setting where smartphone users receive more hedonic product feature descriptions, might result in a higher purchase intention for the self-customized product.

Similarly, Wakefield and Inman (2003) supported that assumption by stating that "Enhancing the hedonic and social nature of a product or service can allow an organization to gain a competitive advantage (i.e., functional to hedonic conversion)" (p. 208). Therefore, Wakefield and Inman (2003) provided evidence that consumers minimize individual spending for products or services with a functional purpose and that companies which "[…] reposition their product offerings to emphasize more hedonic qualities may be able to (a) attract more buyers at standard prices and/or (b) charge higher prices than

competition" (p. 208). Thus, they indicated that repackaging or positioning food items (e.g., meat or sweets) with hedonic themes (e.g., "reward yourself" (p. 209) or "party time" (p. 209)) at a grocery store may induce hedonic motivations and thoughts about social situations to use these food items, which then leads to a reduction in price sensitivity "[…] for those who buy into the theme" (Wakefield and Inman 2003, p. 209). Building upon these findings, it is proposed that future research might further investigate the effect of hedonic product feature descriptions on WTP for the respective product depending on the electronic device type (smartphone vs. desktop computer) which is used to customize the product.

4.5.2 Physical and Psychological Proximity of Smartphones

Typical smartphone users hold their smartphone in their hands and locate the smartphone relatively close to their body. The smartphone is primarily operated without intermediate devices (i.e., swiping and pressing actions are made directly on the multisensory touch field of the smartphone) (Hong and Kim 2011). Conversely, desktop computers are located at a more distant position from a consumer's body and are mainly operated by intermediate devices (i.e., a keyboard and mouse) (Kim et al. 2012). Thus, both the device operation as well as the device location differ between device types with regard to physical proximity. In particular, while smartphones are regularly physically close to the consumer, desktop computers remain physically distant to the consumer.

Prior research shows that the physical proximity of an object determines a consumer's psychological proximity to the object. In particular, Prelinger (1959) showed that physically close objects are perceived as psychologically close, whereas the opposite is true for physically distant objects (see also Belk 1988, p. 140; Habermas 1999, p. 61). For example, Konok et al. (2016) showed that participants try to maintain proximity to their smartphones and describe a feeling of distress if they are separated from them. Further, they stated that the relationship to objects in modern society (e.g., smartphones, robots, or artificial agents) "[…] shows many constraints and attributes that infant-mother attachment has (e.g., proximity-seeking, separation stress)" (Konok et al. 2016, p. 542).

According to Thomson, MacInnis, and Park (2005), psychological proximity (in the form of emotional attachment) yields downstream consequences for the value attribution of the respective object (or objects that are ultimately associated with that same object);

specifically, psychological proximity serves as a determinant for value attribution (i.e., price premiums). In particular, psychologically close objects are valued more highly in the form of price premiums than are psychologically distant objects.

Further, Bushong et al. (2010) demonstrated that the mere physical proximity of the actual product to the consumer in a shopping context leads to greater WTP (see also Del Saz Salazar and Menéndez 2007). Similarly, Hoch and Loewenstein (1991) argued that physical proximity is possibly the most effective inducer of reference point shifts (i.e., the effect of physical proximity on impulsivity) (see also Mischel 1974), and Baxter, Aurisicchio, and Childs (2015) argued that proximity enables individuals to recognize product features that would otherwise remain undiscovered.

In summary, a meaningful path for future research might include further investigation of the relevance of the physical distance between a consumer and the electronic device type used (i.e., smartphone vs. desktop computer) in a customization context and the subsequent influence on consumers' decision-making during the customization process. Moreover, valuable insights could be derived not only from the examination of the physical proximity between consumer and device type but also from influences of the physical proximity on the psychological proximity between the consumer and the electronic device type. As has been described in the previously outlined research, if consumers perceive the psychological proximity as close, they attribute more value to products. Therefore, it could be promising to further research and understand the role of electronic device types in commercial contexts such as consumer product customizations since physical distance between consumers and device types varies depending on the electronic device type used.

5 Conclusion

The fundamental goal of this dissertation was to gain an in-depth understanding of the underlying psychological mechanisms that were hypothesized to explain the effect of electronic device type usage (smartphone vs. desktop computer) on consumers' WTP for a customized product and the final product feature composition.

A review of prior research on consumer decision-making in consumer product customization architectures and smartphones in consumer research formed the basis for this investigation of the current research and contributed to an in-depth understanding of these research areas. Further, this review established the neglected areas of research on electronic device type usage in consumer product customization architectures as well as substantial research gaps regarding consumers' implicit hedonic and social value attribution toward different electronic device types (smartphones vs. desktop computers).

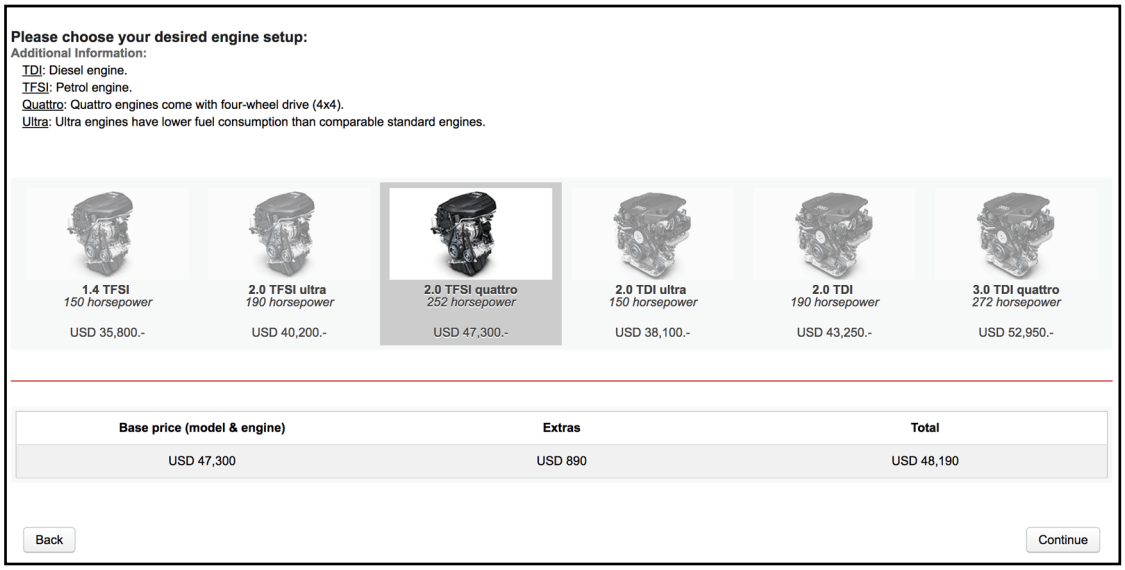
Building upon these findings, it was argued that the use of a smartphone increases consumers' WTP for a customized product and leads to a final product feature composition that comprises more socially visible product features. Results based on large-scale field and experimental studies supported that assumption. In addition, the underlying rationale of the aforementioned effects was investigated in this dissertation. First, it was assumed that consumers experience a preexisting affective hedonic state that is determined by hedonic activities performed on a smartphone (vs. a desktop computer), and results in a higher hedonic value attribution toward smartphones compared with desktop computers. Consistent with the findings of prior research, this hedonic value attribution led to an increase in consumers' WTP for a self-customized product for those who used a smartphone (vs. a desktop computer) during the customization process. Second, it was assumed that social value attribution to a smartphone (vs. desktop computer) is caused by the social connotations of that electronic device type. However, the results did not provide evidence for this assumption.

In total, the author intended to contribute to a more detailed understanding of consumer product customization behavior regarding the usage of specific electronic device types (i.e., the smartphone and desktop computer).

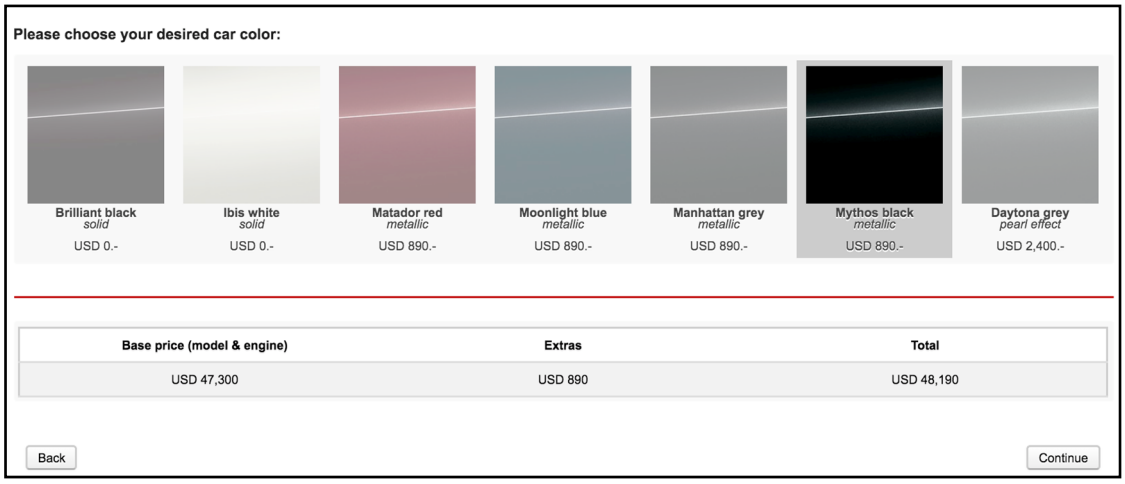
6 Appendix

Experimental Car Customization Task (Study 3 and Study 4):

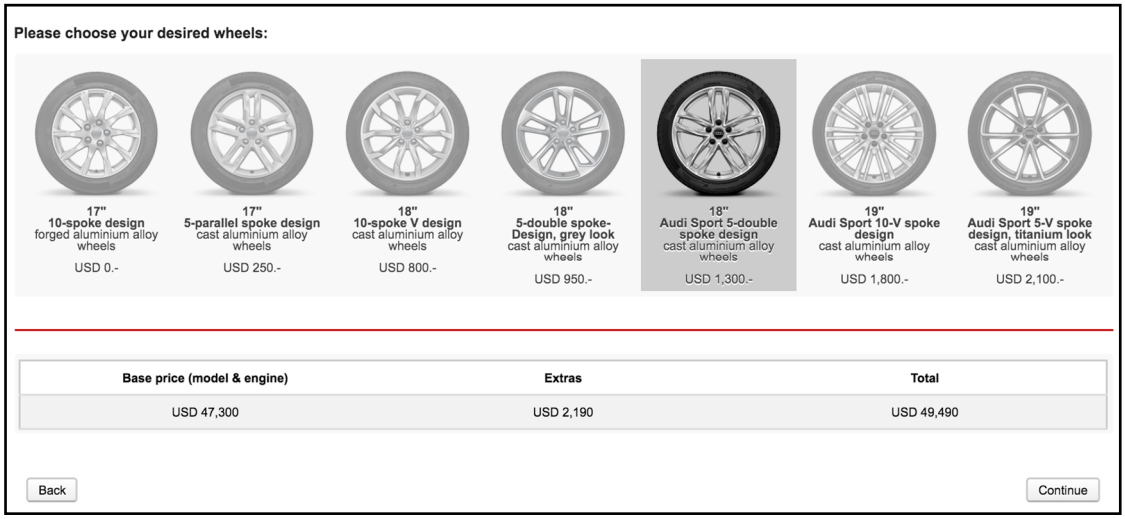
Step 1: Illustration of Engine Selection



Step 2: Illustration of Color Selection

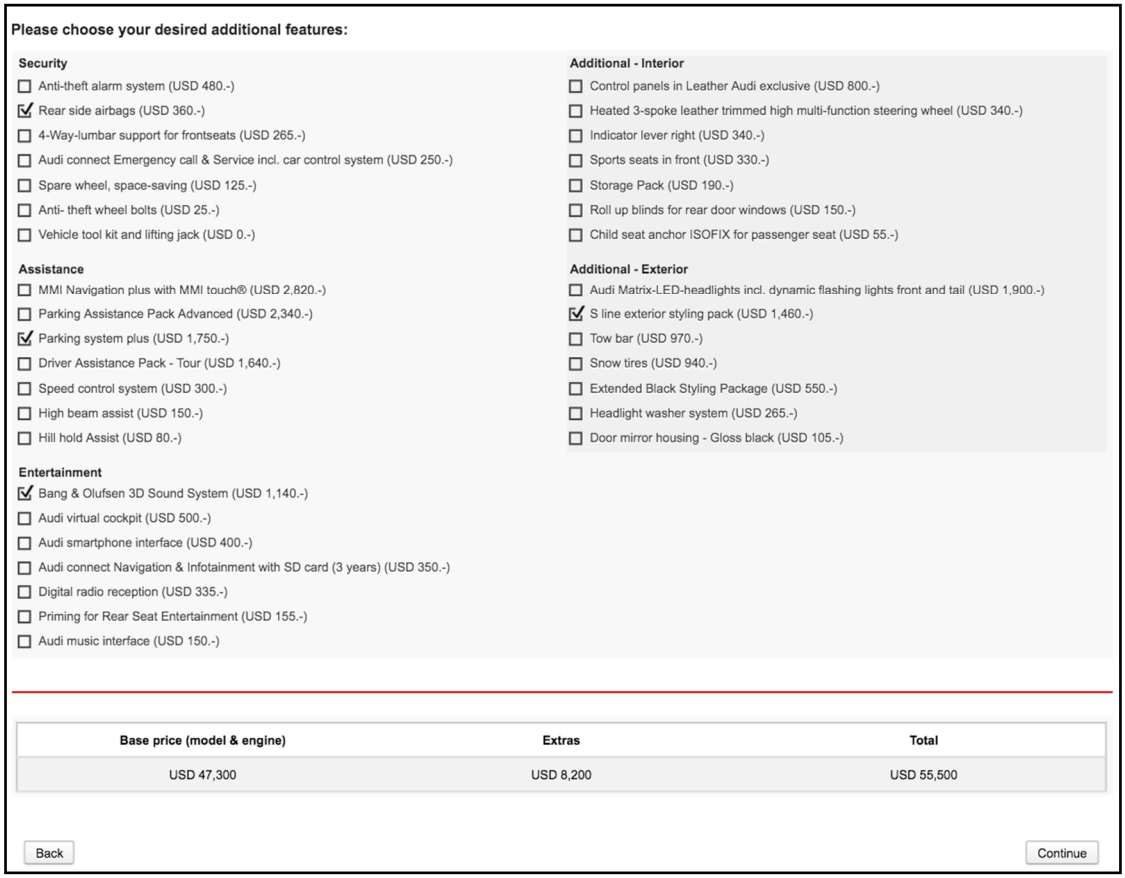


Step 3: Illustration of Wheel Selection



Step 4: Illustration of Interior Selection

Step 5: Illustration of Additional Feature Selection



Step 6: Illustration of Customized Car

Your Audi A4 Avant

Engine:	**2.0 TFSI quattro** *252 horsepower*	USD 47,300.-
Exterior Color:	**Mythos black** *metallic*	USD 890.-
Wheel Type:	**18''** **Audi Sport 5-double spoke design** cast aluminium alloy wheels	USD 1,300.-
Interior Design:	**Leather/Alcantara Seat upholstery** Seats: Rock grey Dashboard: Granite grey-Rock grey Carpet: Granite grey Headlining: Titanium grey	USD 1,300.-
Additional Features:	Rear side airbags	USD 360.-
	Parking system plus	USD 1750.-
	Bang & Olufsen 3D Sound System	USD 1140.-
	S line exterior styling pack	USD 1460.-
	Base Price:	USD 47,300.-
	Other Features:	USD 8,200.-
	Total:	**USD 55,500.-**

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