Multichannel E-Commerce: Consumer Behavior across E-Channels and E-Channel Touchpoints

A Dissertation

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Gerhard Wagner

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Primary Supervisor:

Prof. Dr. Hanna Schramm-Klein

Advisory Committee Members:

Prof. Dr. Joachim Eigler

Prof. Dr. Volker Stein

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University of Siegen

School of Economic Disciplines

This dissertation was defended on

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and approved by

Prof. Dr. Hanna Schramm-Klein

Prof. Dr. Joachim Eigler

Prof. Dr. Volker Stein

Prof. Dr. Marcus Schweitzer

Summary

The Internet has become a significant part of the retail landscape and altered the way consumers search for information and conduct purchases. This dissertation incorporates that through the increasing multiplicity of Internet-enabled devices, which consumers now use for online shopping activities, the online retailing environment itself changes fundamentally. Accordingly, it is relevant for marketing research and practice to consider which connected devices consumers use for online shopping and how varying characteristics of these devices influence online shopping behavior.

The *first key proposition* of this research is that Internet-enabled devices constitute diverse e-channels, which leads to a fragmentation of e-commerce, i.e., a subdivision of online transactions across a multitude of distinct devices. In this manner, an electronic channel "e-channel" is understood as a category of Internet-enabled devices (for example, mobile devices) that consumers can use to interact with and purchase from an online retailer. The *second key proposition* is that the evaluation and perception of an e-channel depends on the utilized e-channel touchpoint, i.e., the customer contact point that is provided by the retailer. In this context, an e-channel touchpoint is defined as a specific digital shopping format (for example, a mobile shopping app) that is employed by a retailer to provide consumers with an online shopping opportunity. The *third key proposition* is that the expanding e-commerce environment requires a perspective shift from online retailing through a singular "online channel" to online retailing through an advancing multiplicity of e-channels and related touchpoints.

This enhanced perspective comprises that consumers have more versatile alternatives (i.e., devices) to shop online and that retailers need to manage (i.e., develop, operate, coordinate and integrate) multiple e-channel touchpoints. Therefore, in this dissertation a multichannel

perspective is adopted for e-commerce that contributes to investigating individual e-channels as well as the interrelationships across e-channels and e-channel touchpoints. By merging insights from multichannel retailing with knowledge from e-commerce research, both fields are consolidated to the "multichannel e-commerce" approach. The term "multichannel e-commerce" refers to an expanded e-commerce environment that is characterized by consumers online shopping across multiple e-channels and online retailers selling through various e-channel touchpoints. By considering e-channels and e-channel touchpoints within a holistic multichannel e-commerce system, this research adds knowledge to current literature by studying the outcomes of e-channel interrelationships as well as individual e-channel effects. In particular, this work contributes to knowledge on retailing by investigating the relevance of individual e-channels and e-channel touchpoints from a customer's perspective, by examining consumer behavior in a multichannel e-commerce environment and by deriving implications for firms to develop customer-centric multichannel e-commerce systems. To better understand consumer preferences and behavior across e-channels and e-channel touchpoints, this dissertation provides a theoretical foundation and empirical validation of a multichannel e-commerce framework.

In particular, this doctoral research enhances theoretical and practical knowledge by addressing various aspects of the multichannel e-commerce environment in four individual essays. All in all, the data of more than 2,100 respondents who have participated in several online surveys and experimental studies could be obtained to test causal relationships proposed in the underlying models of the four essays. The first essay focuses on the exploration of a research gap with regard to the understanding of online retailing in current marketing literature and the development and empirical validation of a multichannel e-commerce framework. Essay 2 addresses consumer perception and evaluation of online shopping across different e-channels. In the third essay, the diffusion and acceptance of a new

e-channel is examined by investigating consumers' motivations to shop online via Internet-enabled TV. In essay 4, the holistic effects of a retailer's multichannel e-commerce system are focused by investigating the influence of synergies and complementarity across e-channels and their effects on consumer behavior.

The four essays of this dissertation show that consumers use diverse connected devices for online shopping activities and choose an e-channel based on technological and situational factors. Thus, retailers are challenged to accompany their customers on each and every channel by providing adequate e-channel touchpoints (shopping formats). Findings underline especially the relevance of a more differentiated perspective for the definition and conceptualization of online retailing. Consumers may perceive, evaluate and behave differently, depending on the utilized e-channel or e-channel touchpoint. Therefore, how a retailer's online retailing activities are perceived by consumers and how these affect online shopping behavior has to be considered in matters of the devices (hardware) and formats (software) employed by the online shopper. To sum up, the results indicate that online consumer behavior is moderated by employed e-channels and e-channel touchpoints.

From a theoretical perspective, this work offers a multichannel e-commerce approach and framework that extend the existing knowledge on online retailing by introducing and defining "e-channels" and "e-channel touchpoints." Moreover, this dissertation extends the existing research on multichannel retailing by expanding the concept of "the online channel" to a multitude of e-channels and related touchpoints. The expanded perspective provides an approach for researchers to generate more valid findings by considering the effects of e-channels and e-channel touchpoints on online consumer behavior. In addition, this research offers theoretical explanations with regard to consumer motivations to use different e-channels and e-channel touchpoints for online shopping and the external factors that determine these motivations.

With regard to the employed methodologies, the categorization of e-channels on the basis of consumers' perceptions of Internet enabled devices through multidimensional scaling delivers valuable insights how consumers subdivide the online retailing landscape. Furthermore, structural equation modeling combined with a multigroup analysis is found to be a suitable approach to examine online consumer behavior across individual e-channels or e-channel touchpoints as well as consolidated to a retailer's multichannel e-commerce system.

This dissertation provides knowledge and implications for online retailers, multichannel retailers and retailers who consider to initiate and take part in e-tailing. By illustrating how the online retailing environment and online consumer behavior have changed, guidance is offered to managers for making more informed decisions with respect to online retailing strategies. In particular, this research provides new insights and implications for managers in three main domains: (1) How to use a multichannel e-commerce perspective for gaining insights in e-channel and e-channel touchpoint choice, (2) how to strategically implement e-channel touchpoints, an (3) how to manage the interactions across e-channels.

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Second, I would like to thank all colleagues that accompanied me during my time as Ph.D. student at the Marketing Department. Prof. Dr. Julia Naskrent, Dr. Bastian Staub, Dr. Nikolaus Hohl, Celina Steffen, Markus Welzel, Kim-Kathrin Kunze, Florian Neus, Robér Rollin and Frederic Nimmermann enriched my time with pleasant cooperation, lively discussions, controversial ideas, athletic challenges and amusing lunch and coffee breaks. My honest gratefulness goes to Dr. Sascha Steinmann and Dr. Gunnar Mau who became mentors to me and supported my research through relevant suggestions, methodological hints and demanding questions. I offer my sincere gratitude to Carmen Richter for proofreading innumerable drafts of manuscripts, articles, reviews and—of course—this dissertation.

Third, I would like to thank my friends who have supported me in many ways in writing this dissertation. They not only listened to my tales from the daily routine of academic education and research, but also helped me to gain enough spare time to restart for the challenges of the next office day.

Special gratitude is dedicated to my fiancé, Sarah. Through her continuous support, unconditional patience and incredible good cooking, she laid the best foundation for my Ph.D. phase. I am deeply thankful for the love and joy that surrounds me every day I spend with her.

Last but certainly not least, I emphasize my thanks to my parents. The encouragement, care and love of my mother and father, Susanne and Eduard Wagner, were the best framework to develop this dissertation.

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Gerhard Wagner

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List of Abbreviations

AGFI	adjusted goodness-of-fit index
AMOS	analysis of moment structures
ANCOVA	analysis of covariance
ANOVA	analysis of variance
app	application
AVE	average variance extracted
CB	covariance-based
CFI	comparative fit index
CMB	common method bias
CMV	common method variance
CR	composite reliability
df	degrees of freedom
e-channel	electronic channel
e-commerce	electronic commerce
e-tailing	electronic retailing
ENJ	enjoyment
EOU	ease of use
F	F-statistic
GFI	goodness-of-fit index
H	hypothesis
IDT	innovation diffusion theory
IETV	Internet-enabled TV
INT	intention to use
M	mean
m-commerce	mobile commerce
MDS	multidimensional scaling
MSI	Marketing Science Institute
N	number of sample size
$n.s.$	not significant
p	p-value
p.	page
PC	personal computer
PDA	personal digital assistant
PE	person-environment fit theory
PLS	partial least squares
PUR	intention to purchase
r	Pearson's r (correlation coefficient)
R^2	R-squared (coefficient of determination)
RMSEA	root mean square error of approximation
RQ	research question
SAT	satisfaction
SD	standard deviation
SEM	structural equation model
sig.	significance level
SL	standardized loading
SPSS	Statistical Package for the Social Sciences
t	t-statistic
TAM	technology acceptance model
TDI	theory of disruptive innovation

TLI	Tucker-Lewis index
TRA	theory of reasoned action
TWA	theory of work adjustment
UMTS	Universal Mobile Telecommunications System
USE	usefulness
U&G	uses and gratifications theory
VIF	variance inflation factor
3G	third generation of mobile telecommunications technology
α	Cronbach's alpha
β	beta (standardized coefficient)
$	US-dollar

Prologue: A recent Multichannel E-Commerce Scenario

In the morning, on his way to work, Charlie feels a little shacking on his left wrist. His *smartwatch* is informing him that he has just received a message. Charlie takes a look at the *smartwatch* and recognizes that it is a "new devices" alert from his favored online retailer. With a tap and wipe on the watch display, he transfers the alert to his *smartphone* that opens the *retailers app*, while he grabs the mobile device from his coat pocket. Charlie reads the message, which tells him that a new collection of connected devices is now available for ordering. He browses through the inventory of new devices and puts two of the products on his personal watch list.

Later at work, Charlie is quite busy, so he doesn't go out for lunch. Instead, he fetches a coffee and a schnitzel sandwich from the local cafeteria to pass lunchtime at his desk. While eating his sandwich, Charlie uses his *laptop* to visit the *retailer's homepage* and takes a closer look at the products that he has added to his watch list in the morning. At the moment, there are no customer reviews available for those new products, but the retailer added a video presentation of the manufacturer to the product description. After having watched the product video, Charlie moves one of the two products from the watch list to the shopping basket, before resuming his work.

In the evening, when Charlie arrives home after a stressful day in the office, he and his girlfriend spend their leisure time in front of their *Internet-enabled TV (IETV)*, watching a 3D movie. During the commercial break, an advertising spot of a retailer for consumer electronics reminds Charlie that he has left a product in his shopping basket. He takes his *tablet computer* from the coffee table and taps the *app* of his favored online retailer, where he finds the product in the shopping basket. Before placing the order, he wants to ask his girlfriend about her opinion. Therefore, he transfers the product site with a wipe on the *tablet* display to the

big screen of the *IETV* where a *TV optimized homepage* of the retailer loads immediately. While he shows the product video to his girlfriend, he recognizes a new function on the TV site called "3D Product Experience." He asks his girlfriend to put the 3D glasses back on, which they already employed to watch the 3D movie. Now both can see a three-dimensional interactive illustration of the product, which they can rotate and zoom in through gestures recognized by the motion control of the *IETV*. Surprisingly, his girlfriend is quite enthusiastic about the product, so he places the order via his *tablet*.

On the next morning, there is a little shaking on Charlie's wrist again. Today, the *retailer's alert* on his *smartwatch* is informing him that the order from yesterday evening has been dispatched and will arrive in the afternoon. The first thing Charlie does when he is back home in the evening is to unwrap the parcel and to sense the excitement when he activates the new generation of *Google Glass*.

A. Introduction

1. Relevance and Focus

"*Customers are opportunistic shoppers and use whichever channels and devices work best for them at the time they are interested in the buying process.*" John Donahoe, CEO, eBay[1]

The diversity of Internet-enabled devices that consumers utilize to connect to the World Wide Web is increasing and changing consumer behavior. Next to laptops and desktop computers, alternative devices such as smartphones, tablets and Internet-enabled TVs constitute an expanding multiscreen environment and offer consumers a multiplicity of online channels. According to a recent consumer survey with nearly 60,000 respondents from 59 countries, 35 % of the population already utilizes three or more connected devices (TNS Infratest and Google 2014). Market researchers expect that adoption and multiple device ownership will further increase as a consequence of new users, innovative technologies and faster network connections around the globe (Millennial Media 2014). In line with this assumption, Strategy Analytics (2014) estimate that by 2020, 33 billion Internet-enabled devices will be in use, which is equivalent to 4.3 devices for every person in the world at this point in time.

Provided that connected devices offer a screen and access to the World Wide Web, consumers can use them to shop online, e.g., to search for product information, compare prices and order goods. Likewise, for online retailers, these devices constitute electronic channels (e-channels), which provide transactional opportunities and are defined in this dissertation as follows.[2]

> *Definition*: An **e-channel** is as a category of Internet-enabled devices (for example, mobile devices) that consumers can use to interact with and purchase from an online retailer.

From a marketing perspective, it is relevant to understand how the rapid proliferation of connected devices and e-channels is affecting consumer behavior and changing the online

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[1] Cited in MCM (2014, p. 3).
[2] See essay 1 for an elaboration of the e-channel definition and empirical validation of e-channel categories.

retailing landscape (Hennig-Thurau et al. 2010; Zhang et al. 2010; Yadav and Pavlou 2014). The *first key proposition* of this dissertation is that Internet-enabled devices constitute diverse e-channels, which leads to a fragmentation of e-commerce, i.e., a subdivision of online transactions across a multitude of distinct devices.

In 2014, worldwide online sales have increased by 19.3 % within one year to $1,471 trillion (eMarketer 2014). But while in 2007 computers accounted for two thirds of Internet devices, in 2014, their share represents merely 10 % (Strategy Analytics 2014). This shift to alternative devices also affects the way consumers shop online. The amount of e-commerce transactions conducted via smartphones and tablets is increasing and gradually replacing or complementing online shopping via "traditional" computers. Criteo (2014) reports that the percentage of mobile online purchasers already accounts for 25 % in Germany, 41 % in the UK and even 49 % in Japan.

Differences of inherent characteristics of the technology and the utilization context have been identified as relevant factors for technology acceptance (King and He 2006; Massey, Khatri and Montoya-Weiss 2007; Simon and Usunier 2007). Accordingly, marketing research and practice have to consider which connected devices consumers utilize for online shopping and how varying characteristics of these devices influence online shopping behavior (see Figure A-1).

As illustrated in Figure A-1, Internet-enabled devices differ in objective characteristics, for example display size or the way they are handled. It is likely that these differences affect consumers' perception and evaluation of an online shopping experience. A bigger display, for example, enables consumers to perceive more details when investigating product pictures while the specific handling of a device could impact the navigability of an online store. Next to these technological characteristics, devices differ in the way where (place of use), why (utilization), when (usage time) and how (touchpoint) they are utilized by consumers.

	Smartphone	Tablet	Laptop	Desktop Computer	Internet-enabled TV
Display Size (Diagonal)	3-5"	7-10"	11-17"	15-30"	30-55"
Handling	Touchscreen	Touchscreen	Keyboard, Touchpad	Keyboard, Mouse	Remote Control, IETV Keyboard, Speech/Motion Recognition
Place of Use	In store, On the way, Home, Work	On the way, Home	Home, Work	Home, Work	Home
Utilization	Leisure	Leisure	Work, Leisure	Work, Leisure	Leisure ("Lean Back")
Usage Time	Few minutes, frequently during the day	Several minutes, mostly in the evening	Some minutes up to hours, for specific tasks	Some minutes up to hours, for specific tasks	Several hours, mostly in the evening
Touchpoint	App, Website (regular, mobile optimized)	App, Website (regular, mobile optimized)	Website (regular)	Website (regular)	App, Website (regular, IETV optimized)

Figure A-1: Varying characteristics of Internet-enabled devices

To understand how consumers include alternative devices in daily routines with regard to their online shopping behavior is a challenge for retailers and researchers. Hence, the expanding number of devices requires a deeper examination of the perception and evaluation of individual e-channels. The *second key proposition* of this dissertation is, that the evaluation and perception of an e-channel depends on the utilized e-channel touchpoint, i.e., the shopping format that is provided by the retailer and defined as follows.[3]

> *Definition*: An **e-channel touchpoint** is a specific digital shopping format (for example, a mobile shopping app) that is employed by a retailer to provide consumers with an online shopping opportunity.

As Figure A-2 suggests, the e-commerce landscape is broadening through the increasing multiplicity of e-channels and e-channel touchpoints. Therefore, the *third key proposition* is that the expanding e-commerce environment requires a perspective shift from online retailing

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[3] See essay 1 for an elaboration of the e-channel touchpoint term and an investigation of e-channel touchpoints.

through a singular "online channel" to online retailing through an advancing multiplicity of e-channels and related touchpoints. This perspective comprises that consumers have more versatile alternatives (i.e., devices) to shop online and retailers have to manage (i.e., create and coordinate) multiple e-channel touchpoints.
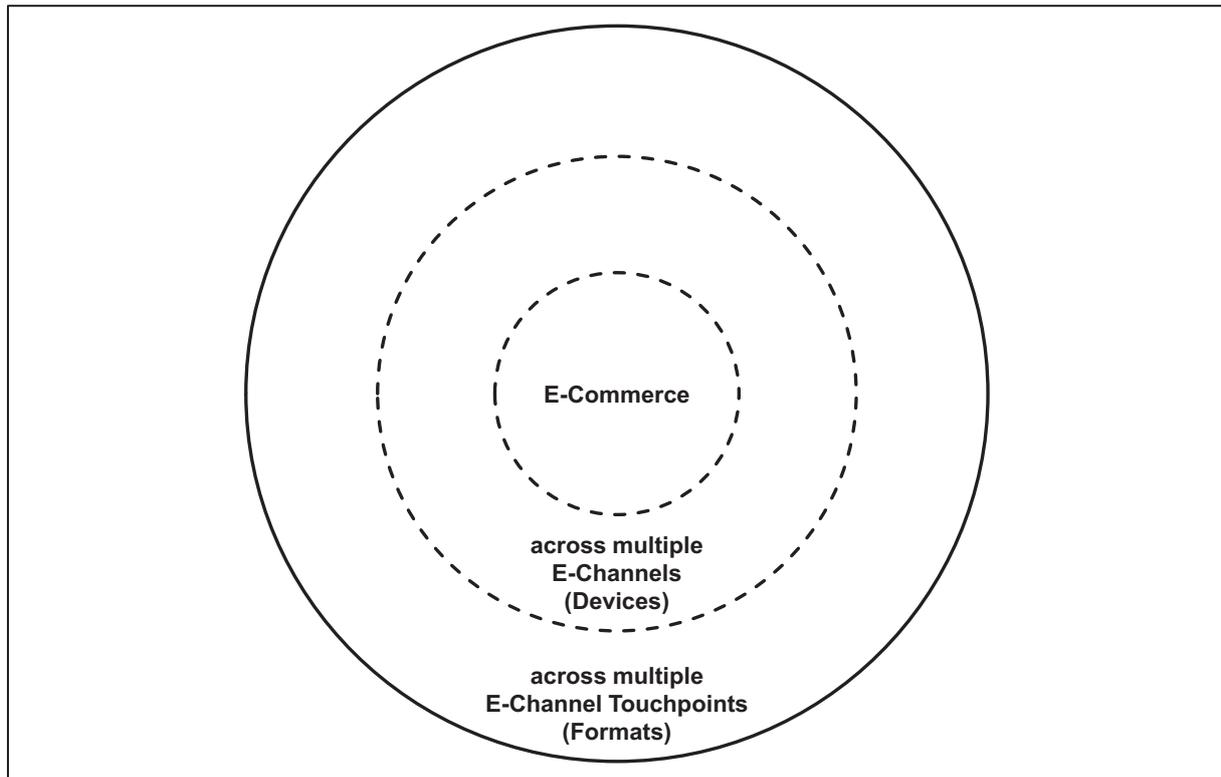
Figure A-2: Expansion of e-commerce

Aside from consumers' perception and evaluation of individual e-channels or e-channel touchpoints, the impact of interactions across e-channels on consumer behavior is relevant to be investigated. Findings from multichannel research underline that cross-channel integration is valued by consumers (Berry et al. 2010; Cao and Li 2015; Schramm-Klein 2003; Schramm-Klein et al. 2011) and that multichannel customers are more profitable (Dholakia, Zhao and Dholakia 2005; Neslin and Shankar 2009; Venkatesan, Kumar and Ravishanker 2007). Therefore, in this dissertation a multichannel perspective is adopted for e-commerce that contributes to investigate individual e-channels as well as the relationships across e-channels and e-channel touchpoints. By merging insights from multichannel retailing with knowledge

from e-commerce research, both fields are consolidated to a "multichannel e-commerce" approach. The *fourth key proposition* of this dissertation is that the expanded e-commerce environment can be illustrated through the multichannel e-commerce perspective, which is defined as follows.

> *Definition*: **Multichannel e-commerce** refers to an expanded e-commerce environment that is characterized by consumers online shopping across multiple e-channels and online retailers selling through various e-channel touchpoints.

Referring to the complementarity hypothesis, the multichannel e-commerce approach suggests that e-channels and e-channel touchpoints have to be regarded as interdependent parts of a consumer's holistic online shopping experience, which contribution in sum is likely to be greater than their individual contributions (Avery et al. 2009). Hence, multichannel e-shoppers would benefit, in the same manner as "traditional" multichannel shoppers, from an integrated and seamless shopping journey across e-channels and e-channel touchpoints. Furthermore, the consideration of a multichannel e-commerce environment, that builds upon diverse e-channels and e-channel touchpoints, extends the common perspective of multichannel retailing by adding a second layer of online channels (see Figure A-3).

Figure A-3 illustrates that in the same way as diverse retail channels expand the retailing landscape, e-channels and e-channel touchpoints expand the online retailing landscape. Consumer can use the same e-channels (device categories) to access a retailer's e-tailing website and retailers can provide additional e-channel touchpoints (shopping formats) to enrich consumers' online shopping experience. For example, a consumer can access a retailer's regular e-tailing website via desktop computer (i.e., the traditional e-channel) or via smartphone (i.e., the mobile e-channel). But since the regular website is developed for the traditional e-channel, it is likely that the mobile shopping experience is rather limited. A retailer could overcome this limitation by providing e-channel touchpoints, for example a

mobile shopping app or a mobile optimized shopping website, that are adapted to the specific

technological characteristics of a smartphone and its situational utilization. The "*New Devices*

E-Channel" indicates that the number of e-channels would increase through the appearance of

new device categories which consumers employ for online shopping activities. Furthermore, a

category of new devices could necessitate to develop new types of e-channel touchpoints.
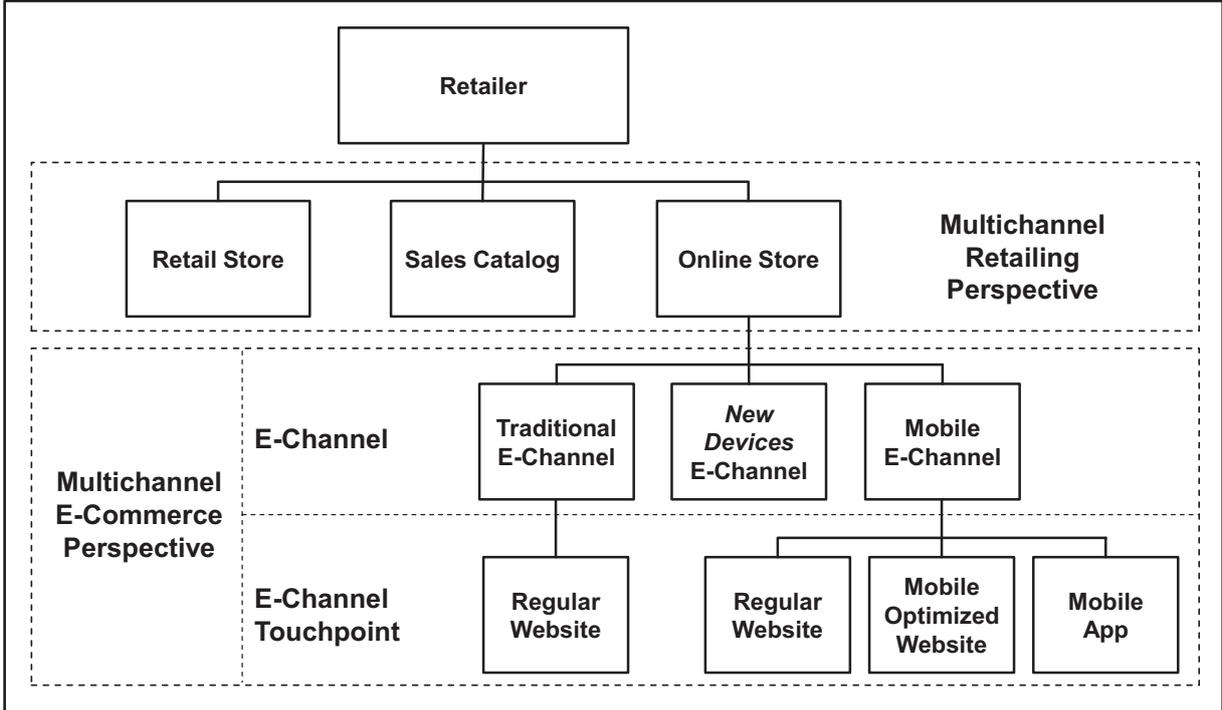
Figure A-3: Perspectives of multichannel retailing and multichannel e-commerce

The main focus of this dissertation is to investigate how consumer behavior is changing as a

consequence of the expanding multichannel e-commerce environment and how these changes

impact marketing research and marketing practice. While acknowledging that e-channels and

e-channel touchpoints also affect consumer behavior in traditional retail channels, for

example in a physical store or the utilization of a catalog, the scope of this dissertation is on

purpose limited to the online retailing environment and online shopping behavior. This

restriction allows to investigate and compare the holistic online customer journey across

diverse e-channels and e-channel touchpoints of pure online retailers or multichannel retailers

that sell online. Furthermore, only e-channel touchpoints provided by a retailer, such as an

e-tailing website or a shopping app, are considered, excluding for example independent rating pages or price comparison websites and apps, which might also play a role in the online customer journey, however are not directly controllable by the retailer. Additionally, this research focuses on connected devices that provide access to the Internet through a visual interface, i.e., a screen, thus excluding wearables, such as fitness bracelets, which do not provide the opportunity for retail transactions.

2.   Research Gap and Contribution

As illustrated in the previous chapter, online retailing has been altered dramatically through a multiplicity of emerging e-channels and e-channel touchpoints, constituting a multichannel e-commerce environment. However, a perspective that captures how online consumer behavior has evolved and changed across multiple devices and touchpoints is widely lacking in academic research, indicating a fundamental research gap.[4] Several researchers support the relevance to close this research gap and underline the necessity of investigating this gap by suggesting related research topics.

For example, Hennig-Thurau et al. (2010) argue that research fails to account for the different types of new multimedia channels and potential spillover effects with other channels. Hence, this dissertation explores the various types of e-channels and e-channel touchpoints, as well as the interdependencies across e-channels as perceived by consumers. The gap is also identified by Oppewal, Tojib and Louvieris (2013) who additionally underline that surprisingly few studies investigate how consumers use multiple channel alternatives during their customer journeys. This dissertation contributes to fill this gap by considering the use of e-channels and e-channel touchpoints within different phases of the purchasing process. In line with this view, Li and Kannan (2014) note that the multiple touches a customer makes before a

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[4] See essay 1 for a broad literature overview and recognition of the research gap.

conversion are rarely taken into account when measuring campaign effectiveness across digital channels. However, this knowledge is necessary to understand which factors (including the attributes and capabilities of e-channels and e-channel touchpoints) lead to a purchase decision or an abortion of the shopping process and is therefore specifically addressed in this dissertation. Furthermore, researchers point out that extant academic research examines how elements of a single channel or a specific medium influence consumer outcomes, but fail to explore these elements as embedded within a (online) retailing mix (e.g., Berry et al. 2010; Dholakia et al. 2010). By considering e-channels and e-channel touchpoints within a holistic multichannel e-commerce system, this dissertation adds knowledge to current literature by studying the outcomes of channel interrelationships, next to individual channel effects.

Gap indicated from	Call to...	Contribution to fill the gap
Zhang et al. (2010)	...examine which new channels will be added to multichannel retailing and what retail formats will emerge and thrive.	This dissertation explores consumers motivation to use various types of e-channels and e-channel touchpoints, as well as the interdependencies across e-channels as perceived by consumers.
Hennig-Thurau et al. (2010)	...account for the different types of new multimedia and potential spillover effects with other channels.	
Day (2011)	...explore which are the most important touchpoints connecting a firm with its customers, how customers are coping with this environment, and how firms should take advantage of this behavior.	
Berry et al. (2010)	...study elements of a single channel or a specific medium as embedded within a (online) retailing mix / develop empirical and analytical models of consumer preferences and behavior with new interactive technologies.	To understand consumer preferences and behavior across e-channels and e-channel touchpoints, this dissertation provides a theoretical foundation and empirical validation of a multichannel e-commerce framework.
Dholakia et al. (2010)	...research consumer shopping behavior within multichannel, multimedia environment.	
Li and Kannan (2014)	...account for the multiple touches a customer makes before a conversion.	This dissertation considers the use of e-channels and e-channel touchpoints within different purchase phases (pre-purchase / purchase) as well as a how consumers benefit from the use of multiple e-channels.
Oppewal, Tojib and Louvieris (2013)	...investigate how consumers use multiple channel alternatives during their customer journeys.	

Table A-1: Overview of research gaps addressed in this dissertation

The existence of a research gap in online retailing and the relevance of a new perspective for the e-commerce environment is also supported by several calls for investigation in previous

research. For example, Day (2011) indicates that there has been a rapid proliferation of touchpoints connecting a firm with its customers and encourages to explore which touchpoints are the most important, how customers are coping with this environment, and how firms should take advantage of this behavior. This dissertation contributes to answer the call by investigating the relevance of e-channels and e-channel touchpoints from a customer's perspective, by examining consumer behavior in a multichannel e-commerce environment and by deriving implications for firms to develop customer-centric multichannel e-commerce systems. Berry et al. (2010) argue that the advent of new interactive technologies calls for empirical and analytical models of consumer preferences and behavior. To understand consumer preferences and behavior across e-channels and e-channel touchpoints, this dissertation provides a theoretical foundation and empirical validation of a multichannel e-commerce framework. Furthermore, by investigating the perception, evaluation and usage intention of individual e-channels and e-channel touchpoints this dissertation answers the call of Zhang et al. (2010) to examine which new channels will be added to multichannel retailing and what retail formats will emerge and thrive. These calls for further research are summarized in Table A-1.

Further indications for a research gap and motivation to contribute to close it can be derived from the Marketing Science Institute (MSI) 2014-16 Research Priorities that reflect an academic composition of marketers' top business concerns (MSI 2014). The MSI 2014-16 Research Priorities are subdivided into three tiers that include several related research topics. The tier 1 priority aims at understanding how customers and consumer behavior have changed as a consequence of new developments in technology. In particular, tier 1 addresses what new types of customer behavior have emerged in a multi-media, multi-screen, and multi-channel environment as well as the question how digital technology changes customer experience and the consumer path to purchase. Tier 2 concerns what marketing activities an organization may

choose to engage in and the developing and delivering of fully integrated marketing programs. In detail, the second tier addresses what roles different touchpoints play at different stages of consumer decision making as well as what models or frameworks are useful to understand the full range of consumer contacts and touchpoints.

From a theoretical perspective, this dissertation contributes to understanding and explaining consumers' e-channel choices and the online consumer journey by bringing together the field of e-commerce research and knowledge of multichannel retailing. Moreover, it contributes to further theoretical knowledge by considering the effects of technological and situational factors to explain online consumer behavior across diverse devices and touchpoints. This dissertation addresses the diffusion and acceptance of e-channels as well as underlying determinants of these factors. The consideration of a multichannel e-commerce environment offers a new theoretical perspective and insights into the field of online retailing that is undergoing a fundamental change through the ongoing appearance of new devices and shopping formats. For future understanding of how technological changes impact online consumer behavior, the multichannel e-commerce framework, which is developed in this dissertation, might serve as a useful theoretical foundation for further e-channel investigations.

With regard to the methodological perspective, this dissertation fills a recognition gap. The recognition gap is expressed by the fact that researchers often overlook the multitude of connected devices that consumers use to shop online when examine online consumer behavior. The shift of "the online channel" perspective to a multichannel e-commerce environment is associated with the challenge for marketing research to develop more reliable constructs, sub-dimensions and scales for capturing online consumer behavior across e-channels and e-channel touchpoints. Hence, academic research as well as marketing practice

is likely to benefit from receiving valid and more reliable findings by applying the multichannel e-commerce perspective when investigating online consumer behavior.

Derived from the above discussed research gaps, calls and topics of interests, four general research objectives emerge that will be addressed in the individual essays that constitute this dissertation:

1. The first objective is to develop an adequate framework for multichannel e-commerce and to explore what devices constitute relevant e-channels from a consumer's perspective.

2. The second objective is to investigate differences across individual e-channels with regard to the perception and evaluation of online shopping with distinct devices.

3. The third objective is to understand the diffusion of e-channels by investigating what motivates consumers to use a new e-channel for online shopping.

4. The fourth objective is to examine the interrelationships across e-channels by considering the role of synergies and complementarity in a retailer's multichannel e-commerce system.

3.   Structure of Essays and individual Contributions

3.1.   *Focus of Essays*

The main goal of this dissertation is to understand consumer behavior across distinct e-channels and related touchpoints and the role of interdependencies across e-channels and touchpoints in a retailer's multichannel e-commerce system. In particular, this dissertation enhances theoretical and practical knowledge by addressing various aspects of the multichannel e-commerce environment in four individual essays. The first essay focuses on the exploration of a research gap with regard to the understanding of online retailing in current marketing literature and the development and empirical validation of a multichannel

e-commerce framework. Essay 2 addresses consumers' perceptions and evaluations of online shopping across different e-channels. In the third essay, the diffusion and acceptance of a new e-channel is examined by investigating consumers' motivations to shop online via Internet-enabled TV. In essay 4, the holistic effects of a retailer's multichannel e-commerce system are focused by investigating the influence of synergies and complementarity across e-channels and their effects on consumer behavior. Table A-2 illustrates the individual contribution of the four essays included in this dissertation to the topics of interests as stated by the MSI 2014-16 Research Priorities.

Topics of Interest	Essay 1	Essay 2	Essay 3	Essay 4
What new customer behaviors have emerged in a multi-media, multi-screen, and multi-channel environment?	✓	✓	✓	
How does digital technology change customer experiences and the consumer path to purchase?			✓	
What roles do different touchpoints play at different stages of consumer decision making?	✓			
What are useful models or frameworks to understand the full range of consumer contacts and touchpoints?	✓			✓

Table A-2: MSI research priorities 2014-16 addressed in this dissertation
Source: MSI 2014.

In the following sections the purpose, research questions and methodology employed in each essay are summarized. Furthermore, the main contributions of each essay are presented.

3.2. Essay 1: A Framework for Multichannel E-Commerce Analysis

The purpose of the first essay is to develop and empirically test a conceptual framework for online retailing that contributes to broadening the understanding of online shopping across e-channels and e-channel touchpoints. By conducting a comprehensive review of the current online retailing literature, a relevant research gap is identified. The gap reveals that marketing research widely overlooks to examine fundamental changes regarding online consumer behavior across connected devices. Based on the multichannel retailing approach as well as grounded on consumer behavior theories a multichannel e-commerce framework is proposed. The framework illustrates an enhanced perspective of the online retailing environment,

incorporating consumers' utilization of e-channels and e-channel touchpoints. To validate the framework, two empirical studies are conducted, addressing the following research questions:

- What devices do consumers currently use to shop online, and can these devices be categorized into diverse e-channel categories from a consumer's perspective?

- How do consumers' evaluations of online shopping vary across diverse e-channels, and how do different situations influence e-channel utilization?

- Does consumers' acceptance of e-channels differ depending on the e-channel touchpoints used?

For the first study, 502 respondents participated in an online survey, comparing and evaluating different Internet-enabled devices. Multidimensional Scaling (MDS), a hierarchical cluster analysis and property fitting were applied to analyze the data and to discover and describe e-channel categories. For the second study, an experimental between-subject design was employed. A total of 136 participants evaluated their experience of an online shopping task that had to be performed in the same manner for two different e-channels and four different e-channel touchpoints. To analyze and interpret the data of the experiment, analysis of variance (ANOVA) and Scheffé post-hoc tests were conducted.

One main contribution of the first essay is to broaden marketing knowledge by disclosing that current research on online retailing widely excludes the availability of diverse e-channels and e-channel touchpoints. Furthermore, through the development of a multichannel e-commerce framework, this work contributes to advance marketing research and practice by offering insights for the expanding online retailing landscape and new e-channel appearances. Based on the findings of the two empirical studies, relevant implications and future research opportunities for the evaluation of e-channels, the design of e-channel touchpoints and the development of customer-centric multichannel e-commerce systems are given.

3.3.   Essay 2: Comparative Analysis of E-Channels

The second essay addresses the issue if the traditional e-channel and the mobile e-channel are perceived and utilized as two different ways of online shopping by consumers. Moreover, its objective is to identify relevant factors of consumers' intentions to shop online across diverse e-channels. For this purpose, consumers' evaluations of individual e-channels in comparison and consolidated to a retailer's multichannel e-commerce system are investigated by addressing the following research questions:

- Does consumers' evaluation and intention to shop online differ, depending on the utilized e-channel?

- What factors influence consumers' intention to shop online across diverse e-channels?

A research model to capture consumers' evaluations of traditional online shopping (using a PC) and mobile shopping (using a mobile device) is empirically tested. By conducting a scenario-based experimental design study with a total of 402 participants, consumers' post-experience evaluations of both e-channels are examined and compared. To control for significant differences with regard to the utilized e-channels and their covariates, analysis of covariance (ANCOVA) is conducted. A covariance-based structural equation model (CB-SEM) combined with a multigroup analysis is employed to test the effects of the research model.

A key contribution of the second essay is the investigation of consumers' evaluations of individual e-channels in comparison and consolidated to a retailer's multichannel e-commerce system. Hereby, this work contributes to the understanding of consumers' perception of different e-channels and underlines that existing models and theories for online shopping have to be reconsidered. Besides, the underlying factors of the intention to shop online via a specific e-channel are investigated and their individual relevance is compared across

e-channel formats. This contributes to assess if individual e-channels are perceived as interchangeable and to understand how consumers' evaluation of online shopping is affected through the characteristics of single e-channels.

3.4.   Essay 3: Online Shopping via the Internet-enabled TV E-Channel

The focus of the third essay is on consumers' attitude and intention toward online shopping via the Internet-enabled TV (IETV) e-channel and how technological and environmental aspects influence shopping motivations toward this technology. In particular, the following research questions are addressed:

- What motivates consumers to shop online via the IETV e-channel?

- To what extent do technological and environmental antecedents affect consumers' motivations to shop online via IETV?

- How does the employed e-channel touchpoint influence consumers' evaluation of IETV shopping?

To address these research questions, a quasi-experimental field setting was employed in a real living room to explore IETV shopping behavior of 193 consumers. Moreover, this work extends prior research by investigating consumers' motivation to use an IETV to shop online across two e-channel touchpoints (an IETV shopping app vs. the regular online store via IETV browser) of the same online retailer. To test a set of hypotheses, partial least squares structural equations modeling (PLS-SEM), analysis of variance (ANOVA) and multi-group analysis were conducted.

From a theoretical perspective this essay contributes by extending a motivational model with specific concepts from fit theories. In particular, a new construct, the "task-environment fit" is introduced, defined and its influence on hedonic motivations is empirically investigated. From a methodological perspective this is the first study that investigates actual IETV shopping

behavior in a typical situational context. By examining the motivations, attitude and usage intention toward online shopping via a new e-channel, the conducted study is valuable for assessing and validating the expansion of the multichannel e-commerce environment.

3.5. Essay 4: Synergies and Complementarity in Multichannel E-Commerce

Through the increasing availability of Internet-enabled devices, online shopping behavior changes and shifts to a multi-device usage. This implies that retailers have to operate, manage and coordinate diverse online retail channels. Next to specific capabilities of an individual online channel, interactions across e-channels are likely to affect online shopping behavior. Kwon and Lennon (2009) emphasize that retailers must understand synergies (similarities) and complementarity (differences) in their customers' expectations so that individual channels become compatible and complement each other. Hence, in this essay knowledge from cross-channel management and e-commerce is merged to investigate the role of synergies and complementarity across e-channels and their effects on online shopping behavior. With regard to the multichannel e-commerce environment, the following research questions are addressed:

- How do synergies and complementarity across e-channels influence consumers' perception and usage intention of a retailer's multichannel e-commerce system?

- From a consumer's perspective, is it more relevant for a retailer to create synergies or to provide complementarities across e-channels?

Based on theoretical assumptions derived from diffusion, information integration and resource-based theory, a conceptual model for a multichannel e-commerce environment is developed and empirically tested with a data set of 904 consumers. To analyze the data partial least squares structural equations modeling (PLS-SEM) is employed.

This essay contributes to further understanding of multichannel retailing and e-commerce research by empirically investigating cross-channel effects in a multichannel e-commerce

environment. In particular, this research is a first attempt to postulate and empirically examine effects of synergy and complementarity in a multichannel e-commerce system. The main contribution of this essay is to provide insights how to create a "seamless" e-channel environment and how to deliver individual benefits through single e-channels.

3.6.   *Overview of Essays and related Research Characteristics*

Table A-3 provides an overview of the four essays and the related research characteristics. For each essay the research objective is summarized and information about the research design is provided. Furthermore, the sample size for each study as well as the methodological variety is illustrated. All in all, more than 2,100 respondents could be obtained to participate in online surveys or experimental studies to test causal relationships proposed in the underlying models and lay ground for the foundation of the multichannel e-commerce approach.

	Essay 1	Essay 2	Essay 3	Essay 4
Objective	Development of a multichannel e-commerce framework and empirical validation	Compare consumers' evaluation and intention to shop online across traditional and mobile e-channels	Motivations, attitudes and intentions toward online shopping via the IETV e-channel	Role of synergies and complementarity in a multichannel e-commerce system (traditional, mobile and IETV e-channel)
Design	Study 1: Online Survey Study 2: Laboratory Experiment	Laboratory Experiment	Quasi-experimental Field Study	Online Survey
Sample Size	Study 1: $N = 502$ Study 2: $N = 136$	$N = 402$	$N = 193$	$N = 904$
Methodology	Multidimensional Scaling; Cluster Analysis; Property Fitting; ANOVA	ANCOVA; CB-SEM; Multigroup Analysis	ANOVA; PLS-SEM; Multigroup Analysis	PLS-SEM

Table A-3: Summary of research characteristics

B. A Framework for Multichannel E-Commerce Analysis[5]

1.   Introduction

Researchers recognize that the range of Internet-enabled devices that shoppers use to search for product information or to purchase online has expanded (Bruner and Kumar 2005; Grewal, Roggeveen and Runyan 2013; Hofacker 2012; Nysveen et al. 2005). Through the ongoing appearance of new technological devices, an increasingly larger set of electronic channels (e-channels) becomes available to retailers and consumers (Hsiao and Chen 2013; Shankar and Yadav 2010; Sousa and Voss 2006; Van Bruggen et al. 2010). With every device that allows individuals to access an e-tailing site, such as a computer, smartphone, tablet, or Internet-enabled TV, the online customer journey is getting more versatile but also more complex. In the context of consumers' channel choices, multichannel researchers emphasize the need to understand which benefits individuals derive from each retail channel in order to determine effective individual channel strategies and to employ a customer-centric multichannel retailing strategy (e.g., Noble, Griffith and Weinberger 2005). Therefore, in this essay, a multichannel perspective for online retailing itself is adopted, i.e., a multichannel e-commerce environment is investigated, in which consumers conduct their customer journeys across multiple e-channels (e.g., mobile devices) and e-channel touchpoints (e.g., mobile shopping apps). This extension of the multichannel perspective to a multichannel e-commerce setting advances our theoretical understanding of online consumer behavior and fills a relevant literature gap.

The relevance of a new perspective becomes apparent, when considering that shopping behavior is changing drastically with regard to the utilization of Internet-enabled devices. In

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[5] A modified version of this essay is in preparation for journal publication: Wagner, Gerhard, Hanna Schramm-Klein and Sascha Steinmann, "Online retailing across multiple devices and diverse touchpoints: A framework and empirical investigation of multichannel e-commerce."

2014, Nielsen (2014) investigated the device usage of online shoppers and reports that on global average 80 % shop via computer while 44 % shop via mobile device and 31 % via tablet. These numbers indicate that the worldwide amount of e-commerce transactions happening on alternative devices is increasing. Criteo (2014) estimates that purchases conducted via mobile devices (such as smartphones and tablets) account already for 30 % of global online retail sales. In addition, the diversity as well as the quantity of Internet-enabled devices is still expanding. TNS Infratest and Google (2014) interviewed more than 59,000 respondents in 56 countries about how many connected devices (such as smartphone, computer, tablet, Internet-enabled TV, MP3 player, eReader, etc.) they currently use. More than half (54 %) of the sample population declared to use two or more devices, 35 % at least three and 11 % even five devices or more. This expanding multiplicity of technologies through which customers can shop, makes it relevant for managers to understand which devices consumers use to shop online and what superordinate characteristics of e-channels influence this decision (Berry et al. 2010; Valentini, Montaguti and Neslin 2011). For example, the utilization of a specific device in the online customer journey might depend on the shopping goals or motives of the customer as well as on situational influences (Schramm-Klein, Swoboda and Morschett 2007).

Moreover, the availability of a device category yields the opportunity for retailers to offer multiple touchpoints to shoppers (Oppewal, Tojib and Louvieris 2013; Shankar et al. 2011). Amazon, for example, provides three e-channel touchpoints for tablet users that differ in design, handling and functionality: a tablet optimized website, a regular tablet shopping app and a "window" shopping app. Differences across devices, such as screen size, resolution or interactivity, may affect how consumers respond to marketing content and imply that interfaces may shape consumer reactions to identical content (Brasel and Gips 2013). Hence,

knowledge of how, why and when consumers use multiple devices to shop online is necessary for retailers to address customer needs through suitable online distribution systems.

However, research regarding the implications of the growing diversity in online retailing environments for consumer behavior is rather scarce (Dholakia et al. 2010). In previous research, there is often no consideration of the devices that are used for online shopping and their potential impact on online purchasing behavior. Recently, Yadav and Pavlou (2014, p. 25) indicated that "a desktop-centric perspective dominates extant research, but consumers now rely on a significantly expanded set of devices." Therefore, a key objective of this essay is to extend existing knowledge about online retailing by considering and classifying the multiplicity of devices and diversity of touchpoints that consumers now use for online purchases. Hereby, the perspective of research and retail practice concerning the changed online retailing environment should be enhanced and implications are given how retailers can respond to the challenges entailed by this alteration.

By addressing the issues described above, this essay makes four important contributions to the literature on Internet retailing and online consumer behavior:

1. By reviewing the relevant literature streams, it is revealed that research on online retailing widely excludes the availability of diverse e-channels and e-channel touchpoints.

2. A framework is developed that illustrates the changed environment of online retailing and that could serve as foundation for future research on online consumer behavior and for managerial decision-making with regard to online distribution.

3. In two studies, the framework is empirically validated and initial insights into how consumers evaluate online shopping across e-channels and e-channel touchpoints are given.

4. Based on the findings, relevant implications and future research opportunities for the evaluation of e-channels, the design of e-channel touchpoints and the development of customer-centric multichannel e-commerce systems are derived.

In the following section, prior research is reviewed and synthesized to identify a research gap and to provide important input in setting directions for future research. Next, a theoretical framework that is based on guiding theory is developed and the underlying assumptions are empirically tested through two studies to validate the phenomenon under investigation. In a concluding discussion, insights are given how the multichannel e-commerce environment alters online consumer behavior and what fundamental challenges this entails for academic research and marketing practice. Lastly, how insights from the findings add to current knowledge is demonstrated and issues for further scholarly studies are suggested.

2. Literature Review

To provide a broad overview of online retailing-related research, articles published in the 20 most relevant marketing journals (based on the ranking of Steward and Lewis 2010) from 2010 to 2014 were investigated (see Table B-1). This time period was chosen for investigation because Deighton, Rizley and Keane (2012) dated the proliferation of new media, channel, and customer contact points in their mapping of priority topics over the past quarter century to the year 2010. Therefore, recent research should be aware of an enhanced perspective of alternative e-channels (devices) and e-channel touchpoints (online shopping formats).

As Table B-1 illustrates, only a few current studies consider the availability of alternative e-channels in their conceptual frameworks, research designs or methods. For example, Hernández, Jiménez and Martín (2010) test the moderating effect of e-purchasing experience to analyze the perceptions that lead customers to purchase over the Internet. For this purpose, the authors investigate the equipment (PCs, laptops, cellphones, PDAs, and digital TVs)

employed by the consumer, but they do not consider the effects of the employed devices on usefulness, ease of use or satisfaction with e-commerce. In the context of online and mobile retailing, Lin (2012) explores the effects of multichannel service quality on mobile customer loyalty and shows that e-service quality dimensions have a significant positive effect on their associated m-service counterparts. Yet, it remains unclear what kind of m-service respondents have evaluated, for example a mobile site, a mobile app, or a mix of both.

Articles	Online retailing			
	Narrow perspective		Enhanced perspective	
	No further specification of online retailing	Retailing via a retailer's website	Consideration of alternative e-channels (devices)	Consideration of alternative e-channel touchpoints
Chen, Hsu and Lin (2010)		x		
Chu et al. (2010)	x			
Hernández, Jiménez and Martín (2010)	x		x	
Kukar-Kinney and Close (2010)	x			
Wang, Hernandez and Minor (2010)		x		
Mazaheri, Richard and Laroche (2011)		x		
Ofek, Katona and Sarvary (2011)	x			
Punj (2011)	x			
Valentini, Montaguti and Neslin (2011)	x			
Yoo and Lee (2011)	x			
Avery et al. (2012)	x			
Badrinarayanan et al. (2012)	x			
Cho and Menor (2012)	x			
Lin (2012)	x		x	
Park et al. (2012)		x		
Rose et al. (2012)		x		
Bartl, Gouthier and Lenker (2013)		x		
Brasel and Gips (2013)			x	
Chang and Tseng (2013)		x		
Hsiao and Chen (2013)	x			
Kim and Lee (2013)			x	
Kushwaha and Shankar (2013)			x	
Wu et al. (2013)		x		
Anaza (2014)	x			
Hsieh et al. (2014)		x		
Konuş, Neslin, and Verhoef (2014)	x			
Li and Kannan (2014)		x		x
Maity and Dass (2014)			x	
Taylor and Levin (2014)				x
This article			**x**	**x**

Table B-1: Literature overview: Investigations on online retailing from 2010 to 2014

Based on an investigation of the effects of varying touch-based devices (laptop vs. tablet) on consumer perceptions of products online, Brasel and Gips (2013) argue that research into the interfaces used to access content is as important as research into the content itself. However, the authors do not consider the influence of a potentially missing adaption of the stimuli (a

website) to the characteristics of the devices. To examine the relationships among the motivations, actual interactions (including online shopping), perceived interactivity, and attitudes toward using Internet-enabled TV (IETV), Kim and Lee (2013) identify clusters of users based on their motivations for using the technology. The authors investigate actual interaction of 500 participants' real use of IETV contents, but do not differentiate which IETV touchpoint consumers employed, e.g., an IETV shopping app or an IETV browser. Kushwaha and Shankar (2013) recognize that customers who prefer multiple channels (e.g., web and mobile) may become more engaged in the purchase process than single channel shoppers as they shop across channels. Nevertheless, their empirical investigation of a large cross-sectional database of U.S. customers is limited to the Web channel and catalogs. Maity and Dass (2014) address the impact of channel characteristics on channel choice and decision making across m-commerce and e-commerce. Participants of their study visited the same website via a laptop computer or a mobile device, but it remains undetermined if the website was adapted for both devices.

While the above-mentioned studies deliver valuable insights into the effects of the utilization of alternative e-channels, none of these works consider alternative e-channel touchpoints. Research on alternative e-channel touchpoints is even sparser, and comprehension of online touchpoints is quite inconsistent across studies. For example, Li and Kannan (2014), introduce a methodology to attribute the incremental value of each marketing channel (by which they mean display ads, e-mails, and search engines) in an online environment using individual-level data of customers' touches. By exploring consumers' use of apps for mobile purchases, Taylor and Levin (2014) find that users desire a retailer's mobile app that aids the user in completing a transaction.

In the context of the aforementioned articles, this essay fills a unique gap by proposing an approach that emphasizes the consideration of alternative e-channels and e-channel

touchpoints to foster an enhanced perspective of online retailing (see Table B-1). In particular, by adopting a consumer-centric view of utilized e-channels and e-channel touchpoints, with this approach, prior research on consumer behavior in an online retailing environment should be enriched and extended.

The enhanced perspective is of certain relevance, because as the literature review reveals, most current studies on online retailing are limited to customers visiting and purchasing on a retailer's website (e.g., Bartl, Gouthier and Lenker 2013; Hsieh et al. 2014; Li and Kannan 2014; Park et al. 2012; Wu et al. 2013) or consumers' intentions to shop online in general (e.g., Anaza 2014; Avery et al. 2012; Hsiao and Chen 2013; Konuş, Neslin and Verhoef 2014; Valentini, Montaguti and Neslin 2011). Thus, these studies exclude the effects of alternative e-channels or e-channel touchpoints, respectively. Studies that investigate only consumers' evaluations of online shopping websites disregard that individuals make increased use of alternative e-channels or e-channel touchpoints. On the one hand, the perception and evaluation of a website might be affected by the utilized device—for example, when a website is accessed via smartphone, screen size and handling differ considerably. On the other hand, consumers might prefer and use other e-channel touchpoints to shop online, such as mobile shopping apps. When the interaction with a website is exclusively under investigation, other e-channel touchpoints might either not be captured (leading to an incomplete observation) or bias the findings (through an observation of consumers' evaluations of multiple touchpoints when only one is recognized by the researcher). The examination of online shopping in general, i.e., without considering the utilization of e-channels and e-channel touchpoints, does not capture whether shoppers use alternative e-channels and whether consumers' intentions are influenced by the e-channel or e-channel touchpoint employed. Therefore, studies that investigate consumers' intentions to shop online in general tend to disregard that the online shopping behavior of individuals has become manifold.

While the investigation of websites or online retailing in general has been adequate for an online retailing environment in which Internet shopping predominantly was accomplished in front of a desktop PC and via a retailer's website, the changes in technology and consumer behavior demand an enhanced examination (Kumar 2010). Some researchers recognized the multiplicity of devices more than a decade ago and made this knowledge available through manifold publications. For example, Bruner and Kumar (2005) examined how the use of three different devices (a PC, a wireless phone simulation, and a PDA) to access the Internet influences utilitarian and hedonic factors of technology acceptance. Further studies emphasize the relevance of alternative e-channels, such as Internet kiosks (e.g., McGoldrick and Collins 2007; Meuter et al. 2000; Peterson and Balasubramanian 2002), PDAs (e.g., Berman and Thelen 2004; Kleijnen, Ruyter and Wetzels 2007), and Internet-enabled TV (e.g., Payne and Frow 2004; Sousa and Voss 2006). In spite of these leads, current research widely overlooks the relevance of the effects of the e-channels and e-channel touchpoints utilized.

Furthermore, it is recognized that traditional channels may also play a relevant role in the inter-relation of e-channels and e-channel touchpoints—for example, the role of a smartphone app in a physical store (Sousa and Voss 2006). Nevertheless, the scope of this essay is bounded by the online retailing environment, because the objective is to understand the manifold relationships across e-tailed channels and touchpoints and their implications for the field of marketing.

3. Conceptual Framework

To develop a conceptual multichannel e-commerce framework, first, the terms "e-channel" and "e-channel touchpoint" are defined. Second, main knowledge from theories that are useful to explain the expansion of the online retailing environment through e-channels and e-channel touchpoints are integrated. As a third step, a theoretical rationale to understand

varying consumer perceptions and evaluations across e-channels and e-channel touchpoints is incorporated. Lastly, the conceptual framework is illustrated and related research questions are derived.

Definition of E-channel and E-channel Touchpoint

The altered online retailing environment illustrates the need to develop clear definitions and distinct differentiations between the terms "e-channel" and "e-channel touchpoint" to establish a framework for investigating online retailing across multiple devices and shopping formats. Neslin et al. (2006, p. 96) define a channel as "a customer contact point, or a medium through which the firm and the customer interact." However, this definition does not consider that retailers might offer, and consumers may utilize, multiple touchpoints (e.g., a shopping app, a mobile website, or both) on a specific device (e.g., a smartphone). Therefore, it is argued that because of the advancing multiplicity of shopping devices and shopping formats, a further distinction between an e-channel and an e-channel touchpoint is more appropriate.

Thus, between electronic channels (e-channels) and e-channel touchpoints will be distinguished. An e-channel is defined as a category of Internet-enabled devices (for example, mobile devices) that consumers can use to interact with and purchase from an online retailer. An e-channel touchpoint can be understood as a specific digital shopping format (for example, a mobile shopping app) that is employed by a retailer to provide consumers with an online shopping opportunity. By introducing the terms "e-channel" and "e-channel touchpoint," the understanding of "the online channel" should be extended to a perspective of "multichannel e-commerce."

Expansion of E-channels and E-channel Touchpoints

Rogers (1995) innovation diffusion theory (IDT) is frequently used by researchers as a theoretical background when investigating the acceptance and diffusion of information technologies (e.g., Montoya-Weiss, Voss and Grewal 2003; Venkatesh et al. 2003). It

provides a consumer-centric explanation of when and how innovations (e.g., new ideas, technologies) are evaluated, rejected, re-evaluated and adopted by consumers and serves as an appropriate approach to understand the expansion of e-channels and e-channel touchpoints and their influences on online consumer behavior along the customer journey. According to IDT, adoption and usage decisions are based on subjective evaluations of an individual with regard to the innovation's relative advantage to perform a particular task in a specific situation (Montoya-Weiss, Voss and Grewal 2003). Rogers (1995) proposed five key attributes that typically influence an individual's adoption behavior:

- *Relative advantage* is the degree to which an innovation is perceived to be better than its forerunners. Certain e-channels or e-channel touchpoints might be perceived as superior to their alternatives because they offer unique characteristics or are more beneficial in a specific situation.

- *Compatibility* is the degree to which an innovation is perceived as consistent with existing values, past experiences, and the needs of the potential adopter. The availability of multiple e-channels and e-channel touchpoints that are compatible with the values, experiences and needs of online shoppers may enhance the advantageousness (e.g., perceived usefulness or entertainment) of online shopping.

- *Complexity* is the degree to which an innovation is perceived as relatively difficult to understand and use. Internet-enabled devices are continuously optimized by manufacturers (e.g., through product revisions or updates), and new e-channel touchpoints are developed and adapted to consumer needs to reduce complexity and enhance the ease of use.

- *Trialability* is the degree to which an innovation may be experienced on a limited basis. Because the operational purposes of e-channels are manifold (e.g., for

communication, information or education), consumers gain experience by using an

e-channel for other tasks besides online shopping.

- *Observability* is the degree to which the results of an innovation are visible to others.

    Because increasingly more people use innovative e-channels and e-channel

    touchpoints for online shopping, observability might influence individual's peers and

    personal networks to adapt the behavior of social surroundings.

Next to IDT, theoretical support for the expansion of online retailing through the multiplicity

of e-channels comes from the theory of disruptive innovation (TDI) (Christensen and Tedlow

2000). TDI suggests that the technological changes of disruptive innovations present a

different set of performance attributes that are either valued by existing customers or that

attract new customers. Therefore, disruptive innovations lay ground for new business models

that can fundamentally alter the economics of an industry (Ganesh et al. 2010). Christensen

and Tedlow (2000) characterize the Internet as a disruptive innovation of the retailing field.

Padgett and Mulvey (2007) indicate that new technology is often the source of disruptive

innovations in service industries. The authors underline that computers, cell phones, PDAs,

Internet kiosks, and other devices have become central to many service transactions between

firms and their customers, replacing traditional means of interaction. In line with these

thoughts, it is to assume that the expansion of e-channels and e-channel touchpoints has

become the next disruption, changing the rules of the game in online retailing and altering

online customer journeys fundamentally.

Varying Perceptions and Evaluations across E-Channels and E-Channel Touchpoints

As consumers make increased use of diverse e-channels, it becomes a critical challenge for

retailers to understand how customers evaluate online shopping via a specific e-channel or

e-channel touchpoint. The ability to understand consumers' perceptions of the enhanced

e-channel environment is necessary to adapt or design e-channel offerings that fit customers'

needs and preferences while moving through the customer journey (Cho and Menor 2012). For the framework, the influence of consumers' evaluations of specific e-channel attributes and the situational context are incorporated, which are manifested in innovation diffusion theory and theory of disruptive innovation, as discussed above.

The theory of reasoned action (TRA) suggests that consumers evaluate the consequences of their behavior and intend to act consistent with these evaluations (Fishbein and Ajzen 1975). Verhoef, Neslin and Vroomen (2007), for example, used TRA as foundation for the assumption that consumer perceptions of the search and purchase attributes of different channels translate into the search and purchase attractiveness of each channel. Based on TRA, Davis (1986) developed the technology acceptance model (TAM), which states that the intention to use certain technology is a consequence of beliefs on two dimensions: *usefulness* and *ease of use*, mediated by the individual's attitude toward the technology. TAM has been extensively used in marketing and information systems research to predict the acceptance and use of manifold technologies. Moreover, researchers extended TAM by integrating additional dimensions and underlying attributes (e.g., enjoyment, trust) to enhance its explanatory power (Ha and Stoel 2008). Following these models, beliefs about the benefit of e-channel or e-channel touchpoints attributes should affect consumers' perceptions and evaluations of an e-channel with regard to its advantageousness for online shopping. For example, Loiacono, Watson and Goodhue (2007) extended TRA and TAM to develop the WebQual instrument, an empirically grounded set of scales covering four dimensions (usefulness, ease of use, entertainment, and complementary relationship) that focus specifically on the interface of a website. The composite WebQual scale significantly correlates with intentions to purchase from a website and intentions to revisit a website and seems therefore an adequate instrument for evaluation of e-channels and e-channel touchpoints (Wolfinbarger and Gilly 2003). Thus, while WebQual was developed for evaluating websites, "this approach may be valuable as

new information technologies appear on the scene" (Loiacono, Watson and Goodhue 2007, p. 71).

Further implications to complete the conceptual framework are derived from the uses and gratifications theory (U&G), introduced by Blumler and Katz (1974). U&G predicts that a specific media will be used as a means to satisfy wants or interests and is therefore also applicable for the use of an e-channel or e-channel touchpoint (Keeling, Macaulay and McGoldrick 2007). As a theoretical framework, U&G is helpful to understanding and explaining the motivations for using new media and technology through a "how and why" approach (Kim and Lee 2013). For example, gratification can be obtained from e-channel attributes (e.g., information quality), from familiarity with e-channel utilization (e.g., intuitive operation), and from the social context in which an e-channel is used (e.g., the presence or absence of others). The evaluation of a single subject without considering available alternatives is often mentioned as a limitation of behavioral research (Muthitcharoen, Palvia and Grover 2011). U&G, however, allows to incorporate that users may have alternative choices to satisfy their needs and is capable to help identify why consumers use a specific e-channel or e-channel touchpoint. Following U&G, it is likely that consumers who believe that the attributes of a new online shopping alternative are superior to those of the one currently used, will prefer the new alternative. Therefore, it is to assume that an explicit comparison among alternative e-channels and e-channel touchpoints influences a consumer's adoption or rejection of available e-channels and affects an individual's online shopping behavior along the customer journey (Meuter et al. 2000).

Next to technological attributes, however, situational circumstances are relevant factors that influence consumers' store choice decisions (van Kenhove, Wulf and van Waterschoot 1999). Usage situations, i.e., "those factors particular to a time and place of observation, which do not follow from personal (intra-individual) and stimulus (choice alternative) attributes, and

which have a demonstrable and systematic effect on current behavior" (Belk 1975, p. 158), thus are important in the study of online shopping motivations (e.g., Robinson et al. 2007). With regard to the online customer journey, this suggests that, instead of one e-channel being universally superior to another, the perceived benefit of a particular e-channel depends on situational context (Mathwick, Malhotra and Rigdon 2002). Belk (1975) proposed five distinct situational characteristics that exist independently of a consumer's behavior: physical surroundings, social surroundings, temporal issues, antecedent states and task definitions. The influence of these situational factors on channel selection across three retail channels of a fashion retailer was demonstrated by Nicholson, Clarke and Blakemore (2002). Therefore, it is likely that the use of an e-channel to shop online is not only a consequence of its inherent attributes but also a result of the situational context.

The Multichannel E-Commerce Framework

By integrating the implications from the above mentioned theories, a framework is proposed (see Figure B-1) that allows to investigate how consumers perceive and evaluate different technologies (e-channels) and different formats (e-channel touchpoints). Based on these theoretical considerations, the framework comprises three stages.

The first (upper) stage represents online retailing without any further consideration of e-channels and e-channel touchpoints. This view is equivalent to a "one online channel"-perspective, i.e., that a consumer shops online at all. The second (middle) stage illustrates that consumers have access through manifold Internet-enabled devices to a retailers' online channel. Similar devices with regard to technological characteristics or utilization might constitute an e-channel category, such as traditional devices (e.g., PCs) or mobile devices (e.g., smartphones, phablets, tablets). Shoppers' perceptions and evaluations of the e-tailer could vary across e-channels, especially when a retailer's online store is not adapted to specific devices. Horizontal dotted arrows indicate that consumers can switch across

e-channels during the customer journey or use them simultaneously. In particular, the existence of alternative e-channels entails that online information search, online purchase or claiming of after-sales services do not necessarily have to be conducted using the same e-channel or e-channel touchpoint for all tasks (Kollmann, Kuckertz and Kayser 2012). For example, an online shopper might search for a product via an Internet-enabled TV (IETV), conduct the purchase via a desktop computer and check the delivery status from a smartphone. Hereby, the shopping and service experience of the shopper might depend on the attributes of the e-channel touchpoints and the situational context.
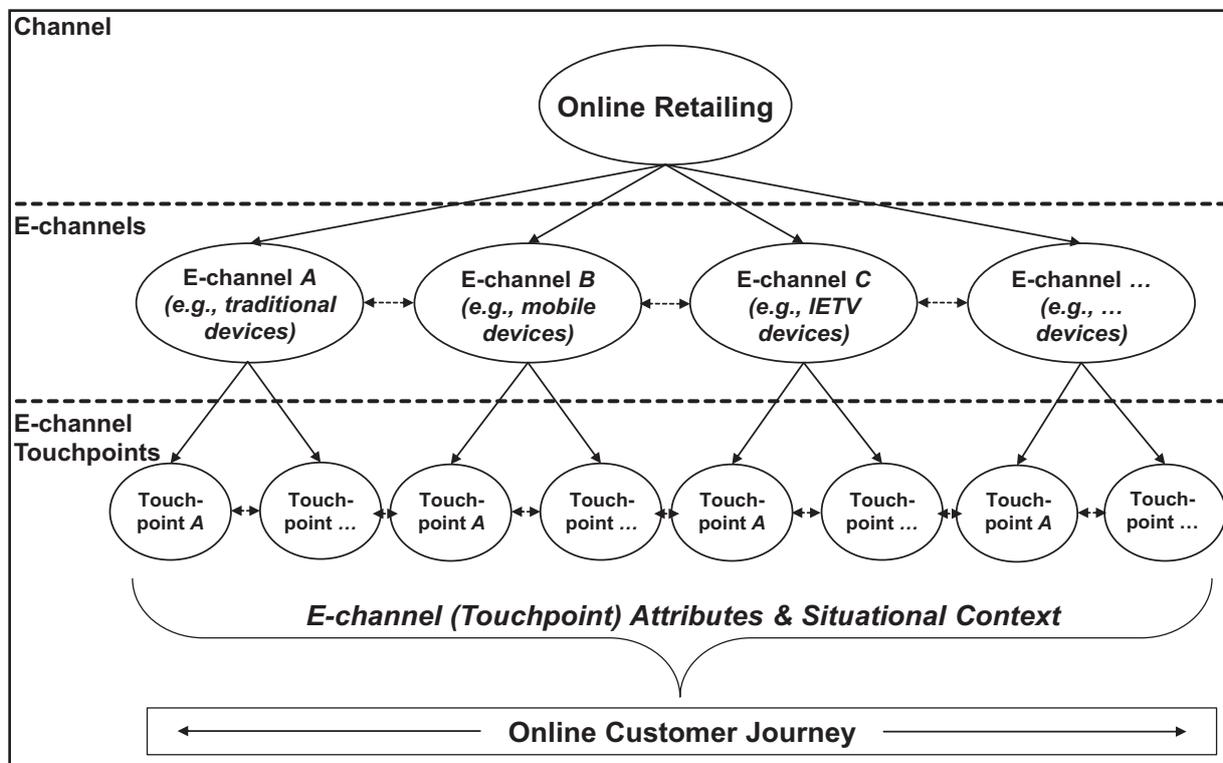
Figure B-1: The multichannel e-commerce framework

E-channel touchpoints are illustrated in the third (lower) stage of the framework. Retailers can provide specific touchpoints for e-channels (e.g., a smartphone shopping app or a tablet-optimized website) and adapt these to the characteristics of the devices and the needs of the consumer with regard to potential utilization scenarios. Horizontal dotted arrows indicate that consumers might switch across e-channel touchpoints (either on the same e-channel or across

different e-channels) during the shopping stages. The holistic view of the three stages and illustrated relationships constitutes the multichannel e-commerce framework of online retailing.

Research Questions

The multichannel e-commerce framework provides insights into how the expanding number of e-channels and e-channel touchpoints change the online retailing landscape and delivers knowledge that is useful for further investigation of online consumer behavior (e.g., the design of experiments, surveys or modeling approaches) and for marketing practice decisions (e.g., the relevance of e-channels and touchpoints). This work might also provide a first step toward an e-channel theory, which would be helpful to understanding consumer behavior in a multichannel e-commerce environment. By conducting two initial studies, the following research questions (RQ) derived from the framework should be answered:

RQ1:   What devices do consumers (currently) use to shop online, and can these

devices be categorized into diverse e-channels from a consumer's perspective?

RQ2:   How do consumers' evaluations of online shopping vary across diverse

e-channels, and how do different situations influence e-channel utilization?

RQ3:   Does consumers' acceptance of e-channels differ depending on the e-channel

touchpoints used

4.   Empirical Studies

By conducting two individual studies, several facets of consumer behavior in a multichannel e-commerce environment are explored according to the stated research questions. To support causal claims, two different methods are employed by combining an online survey with an experimental design. The studies were conducted between July 2011 and March 2013 with two different samples of German consumers. Study 1 is related to the first and second

research question. With regard to the second stage of the framework and RQ1, an overview of Internet-enabled devices that consumers use for online shopping is provided and relevant e-channel categories are identified. Regarding RQ2, it is investigated how consumers' evaluations of online shopping vary across diverse e-channels and utilization scenarios. For the analysis in study 1, two complementary approaches are performed: a visual mapping of consumers' perception space using multidimensional scaling (MDS) and an analysis of consumer's evaluation using property fitting. The objective of the second study is related to the third stage of the framework and to answer RQ3 by investigating how consumers' evaluations of an e-channel differ depending on the utilized e-channel touchpoint. For this purpose, consumers' evaluations are investigated across four e-channel touchpoints employed on two different e-channels, and analyzed by calculating ANOVAs and a post-hoc test.

4.1.   Study 1: Consumers' Utilizations and Evaluations of E-channels

Design and Sample

An initial exploratory study at a large university in Germany was conducted to evaluate a relevant set of Internet-enabled devices that consumers utilize for online shopping. For this purpose, a group of undergraduate students ($N = 82$) were invited to participate in a paper-and-pencil survey and asked to list all devices they already used for online shopping. Twelve distinct types of devices were found that individuals utilize in the online purchasing process (see Table B-2).

For the main study, an online-survey was conducted, addressing German Internet users. Respondents were invited via e-mail and social networks to participate in the survey. Incentives in the form of a draw of online shopping gift vouchers were offered to respondents for completing the online questionnaire. Participants were assured that the results would be evaluated in aggregate to assure their anonymity and only for research purposes. After eliminating data sets containing missing values, the valid data of 502 respondents was

obtained for further analyses. 56 % of the respondents were female, and the average age of the sample was 30.1 (*SD* = 12.3) years. On average, participants used the Internet for 10.58 (*SD* = 3.67) years and shopped online for 5.88 (*SD* = 3.15) years. 73.5 % of the sample population access the Internet several times a day, 16.5 % daily and 10 % once per week or less.

Methods

A perceptual mapping approach was used to capture und illustrate consumers' unbiased conception of Internet-enabled devices in the online shopping context. For this purpose, participants were asked to indicate perceived similarities between a set of devices (deduced from the preliminary study), which they already had used to shop online. Answers were given based on a pairwise comparison of devices—for example, "smartphone and laptop"—using a 7-point likert scale (1 = not similar at all; 7 = very similar). To analyze the data, a visual mapping of the consumers' perception space was performed, using multidimensional scaling (MDS), combined with a hierarchical cluster analysis and the property fitting approach (Padgett and Mulvey 2007). To examine the consumers' perception space, first, a proximity matrix based on the pairwise comparison ratings (perceived similarities) of the devices was created. The survey data was aggregated by calculating means of similarity ratings for every pair of devices. Based on the matrix, the perceptual map was derived through an MDS procedure. The algorithm used was SPSS-PROXSCAL (multi-dimensional scaling of proximity data) (Borg and Groenen 2005). Next, hierarchical cluster analysis was performed to spot groups of similar devices. The coordinates of dimension 1 and dimension 2 from the MDS were taken as inputs for single linkage, complete-linkage, average linkage, and Ward's cluster algorithm and compared for interpretability and consistency. To estimate the optimal number of clusters, the elbow criterion was applied by graphing the development of heterogeneity against the number of clusters.

To investigate how consumers' evaluations of online shopping varies across diverse e-channels, respondents were asked to rate several attributes of the devices in their subset. This subset compromised only devices, which the participant indicated as familiar for online shopping and therefore could be judged on the individual's experience. To avoid fatigue effects, each participant had to rate only six devices (resulting in 15 pairwise comparisons) at maximum. Criteria for evaluating the technology-related attributes of a device with regard to the online shopping context were adapted from WebQual. Items of the central WebQual dimensions usefulness, ease of use, entertainment and complementary relationship were rated by the respondents for the different devices (see Table B-3). According to the original measurement, each WebQual variable was measured with three items (see Loiacono, Watson and Goodhue 2007, for complete item list). For example, "I feel safe in my transactions with the website." was adapted to "I feel safe in my transactions with the smartphone."

To control for situational characteristics, respondents were asked in which situations they use a device to shop online. Situational variables were adapted from Belk (1975) and include: (1) physical surroundings, including geographic location; (2) social surroundings, including the presence of other persons, (3) temporal perspective, including time to reach a shopping destination; (4) task definition, including intention to purchase; (5) antecedent states, including momentary moods. Items to capture the different situational states are provided in Table B-3. All WebQual and situational attributes were evaluated on a 7-point likert scale (1 = does not apply at all; 7 = applies completely).

Results

As Table B-2 illustrates, all 12 types of devices deduced from the preliminary study are utilized for online shopping, while there are some differences with regard to the frequency and share of users across the diverse devices. More than two-thirds of the consumers in the sample have used a laptop, PC or smartphone to shop online. These numbers underline not

only relevance of e-commerce in general but also the increase in mobile shoppers. Somewhat important is the utilization of tablet computers, which have been employed by almost one-third of the respondents who shop online. However, half of the devices (for example, e-readers) have been utilized by less than 10 % of the sample population for online shopping. The low number of "other" devices (.8 %) indicates that the 12 types of devices sufficiently cover the range of current online shopping devices. For the interpretation of these numbers, it is important to consider that use and not ownership of devices was investigated, as individuals might also use the devices of family members or friends.

Device	Number of users ($N = 502$)	Share of users (in %)
Laptop / Notebook	438	87.3
Personal computer (PC)	378	75.3
Smartphone	335	66.7
Tablet computer	154	30.7
Netbook (with UMTS/3G)	95	18.9
Cellphone (classic mobil phone)	71	14.1
Internet-Enabled TV (via game console) [IETV2]	44	8.8
Internet-Enabled TV (TV with integrated online access) [IETV1]	43	8.6
Portable Media Player	37	7.4
Internet-Enabled TV (via Internet TV box, Blu-ray player, etc.) [IETV3]	35	7.0
E-reader	34	6.8
In-store kiosk	8	1.6
Other	4	.8

Note: People were asked the following: "Please indicate which of the following devices you already have used to shop (search for product information/purchase) online."

Table B-2: Number and share of utilization of online shopping devices

The MDS analysis reveals that the 12 devices constitute four areas on the perceptual map—one area in each quadrant. The hierarchical cluster analyses using single linkage, the complete-linkage, and the average linkage algorithm produce a four-cluster solution that supports the visual disposition of the devices conglomeration (see Figure B-2). The first cluster (A) encompasses three devices: PCs, laptops and netbooks. These devices are frequently used to shop online through a web browser and are quite similar in handling (i.e., keyboard and mouse control). As these devices are the primal means of online shopping, the cluster can be described as the "traditional e-channel." The second cluster (B) includes smartphones and tablet PCs, two hand-held technologies. Both devices are compact and

portable; hence, they are assigned to the "mobile e-channel." Three Internet-enabled TV formats (1. integrated online access; 2. online access via a game console; 3. online access via an Internet TV box, connected Blu-ray player, etc.) constitute the third cluster (C), the "IETV e-channel." Compared to the traditional e-channel, the IETV devices are used in a more passive way—in the "lean back" atmosphere of the living room. The last cluster (D) is less homogeneous than the other three groups. It includes e-readers, in-store kiosks, portable media players and cellphones. These devices are rarely used for online shopping but rather complement other e-channels (the "complementary e-channel").
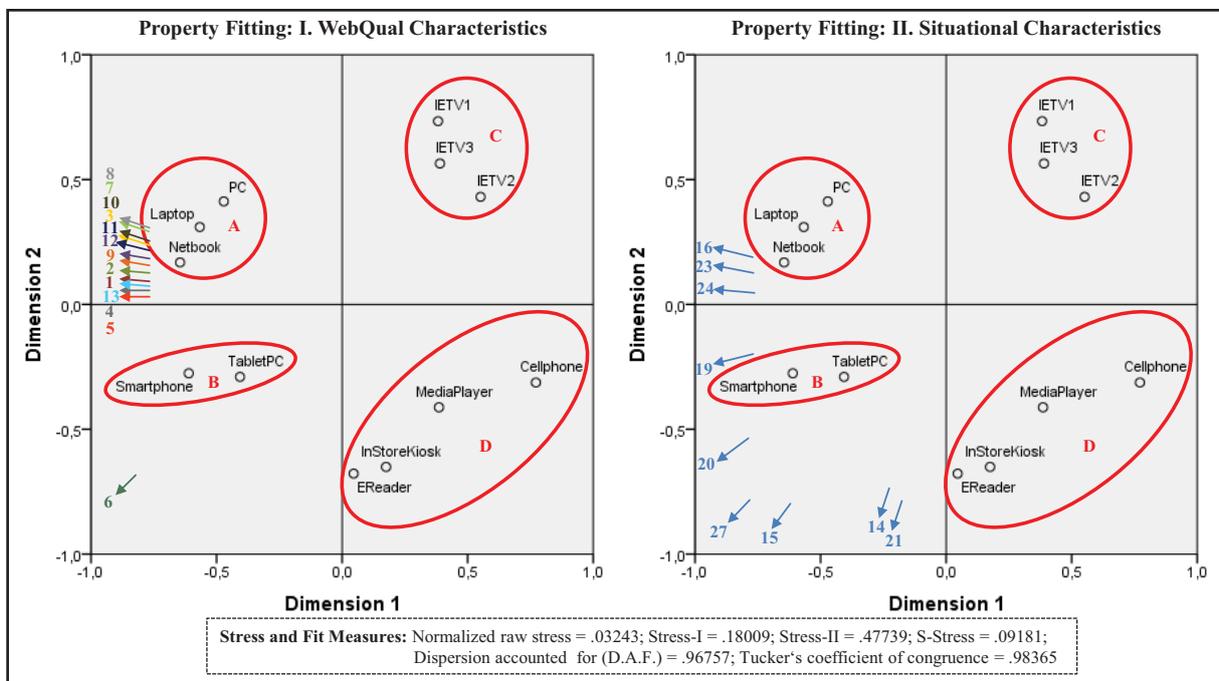
Note: Labeling of WebQual vectors is due to spatial closeness of arrows illustrated in the same order and corresponding color (from top to bottom). Vector numbers are stated in Table B-3. For explanation of IETV1, IETV2 & IETV3 see Table B-2.

Figure B-2: MDS results: perceptional space, clusters and vectors

To improve the interpretability of the MDS configuration, the property fitting approach was used. Property fitting is based on a set of regressions in which the value of the characteristic is used as the dependent variable and the two coordinates of each device in the two-dimensional space as the independent variables (Padgett and Mulvey 2007). Hence, this technique measures the extent to which each characteristic is associated with the position of devices in

the two-dimensional space. Table B-3 provides the dependent variables, R^2, F values, significances and coefficients (unstandardized beta values from the regressions) that can be fitted as vector arrows to the perceptual map and contribute to the interpretation of the clusters and dimensions (see Figure B-2).

Dependent Variable	Dimension	R^2	F-value	Sig.	β Coefficient 1	Coefficient 2
I. WebQual Characteristics						
1. Functional Fit-To-Task		.788	16.681	***	-2.054***	.205
2. Information Quality		.709	10.962	***	-2.276***	.272
3. Tailored Information	Usefulness	.620	7.349	**	-1.682***	.459
4. Trust		.484	4.223	*	-1.273**	.087
5. Response Time		.513	4.735	**	-1.055**	-.003
6. Availability		.590	6.482	**	-1.527**	-1.263*
7. Ease of Understanding	Ease of Use	.529	5.057	**	-1.394**	.445
8. Intuitive Operations		.644	8.149	**	-1.491***	-.481
9. Visual Appeal		.603	6.848	**	-1.147***	.186
10. Innovativeness	Entertainment	.516	4.795	**	-.994**	-.283
11. Emotional Appeal		.644	8.144	**	-1.400***	-.331
12. On-Line Completeness	Complementary	.769	14.962	***	-2.176***	.392
13. Relative Advantage	Relationship	.691	10.075	***	-1.966***	-.187
II. Situational Characteristics						
14. On the Way	Physical	.496	4.436	**	-.831	-2.064**
15. At School / Work	Surroundings	.726	11.929	***	-1.325**	-1.753***
16. At Home		.430	3.389	**	-1.396**	.363
17. With Friends	Social	.076	.369	n.s.	-.217	-.454
18. With Family / Partner	Surroundings	.271	1.669	n.s.	-.749	.077
19. Alone		.482	4.193	*	-1.272**	-.312
20. When I am pinched for Time	Temporal	.555	5.613	**	-1.481**	-1.075*
21. To bridge Waiting Time	Perspective	.717	11.421	***	-.503	-1.839***
22. When I have Time and Ease		.204	1.156	n.s.	-.716	.123
23. To Purchase / Order	Task	.655	8.531	***	-1.983***	.348
24. To Search / Inform	Definition	.659	8.705	***	-2.159***	.263
25. By the Way		.373	2.678	n.s.	-1.136*	-.487
26. Spontaneously		.179	.981	n.s.	-.724	-.192
27. When I am bored	Antecedent States	.559	5.703	**	-.743**	-.766**
28. When I am comfortable		.167	.900	n.s.	-.355	-.680

Note: Significance Level: * = $p < .1$, ** = $p < .05$, *** = $p < .01$.

Table B-3: Property fitting results

For the WebQual characteristics, all F-values are significant, which implies that all characteristics contribute to the interpretation of the MDS configuration. The results for the unstandardized coefficients show that dimension 1 can be explained with the property fitting but dimension 2 cannot be clearly associated with one specific factor. The bunching of arrows in Figure B-2 indicates that all WebQual characteristics, with the exception of "availability" (no. 6), are evaluated by consumers in the same manner. With regard to the direction of the vector arrows (from right to left), dimension 1 can be associated with the quality for online shopping. Both the traditional e-channel and the mobile e-channel are evaluated as adequate

with regard to their usefulness, ease of use, entertainment and complementary relationship. The IETV e-channel and the complementary e-channel perform much worse in matters of their online shopping quality. The cluster of the mobile e-channel indicates its inherent advantage with regard to the direction of the "availability" arrow. Usefulness of mobile devices is a result of their availability that enables consumers to shop anyplace and anytime.

The results of the property fitting with the situational characteristics (variables 14 to 28 in Table B-3) as dependent variables demonstrate that next to the evaluation of quality characteristics, other factors affect consumers' perception of online shopping devices. The situational variables allow a more differentiated interpretation of the clusters and dimensions and are largely consistent with the interpretation of WebQual characteristics (see Figure B-2). The results reveal that the mobile e-channel is especially relevant away from home (physical setting: 14 & 15) but interestingly also when time is critical or else would remain unused (temporal perspective: 20 & 21). The traditional e-channel is the preferred option when online shopping or online information are conducted (task definition: 23 & 24) at home (physical setting: 16).

With regard to the IETV e-channel and the complementary e-channel the findings indicate that consumers perceive both e-channel categories as less appropriate for online shopping with regard to their qualitative attributes. Nevertheless both categories are perceived as alternative online shopping formats. IETV formats might constitute a more relevant e-channel when their market diffusion and utilization frequency increases. The devices of the complementary e-channel are quite heterogeneous and not versatile enough for general online shopping. These devices rather extend usual online shopping in a complementary manner by offering special and device specific online shopping opportunities.

As illustrated in Table B-4, consumers' evaluations of online shopping vary across the four e-channel categories. The traditional e-channel is evaluated most positively with regard to

WebQual attributes, with the exception of "availability" and "innovation," which show the highest scores for mobile devices (cluster B). However, a closer look at the evaluation of situational characteristics indicates that actual utilization is strongly influenced by the situational context, which stimulates especially the use of the mobile e-channel.

Dimension	Attribute	Traditional e-channel (Cluster A)	Mobile e-channel (Cluster B)	IETV e-channel (Cluster C)	Complementary e-channel (Cluster D)
WebQual characteristics					
Usefulness	Functional fit-to-task	**4.88 (1.69)**	3.87 (1.64)	2.28 (1.39)	2.36 (1.71)
	Information quality	**5.77 (1.24)**	5.52 (1.32)	3.32 (1.89)	3.40 (2.23)
	Tailored information	**5.19 (1.39)**	4.92 (1.39)	3.60 (1.99)	3.14 (1.94)
	Trust	**4.82 (1.53)**	4.19 (1.64)	3.51 (1.80)	3.10 (1.89)
	Response time	**4.75 (.85)**	4.47 (.86)	3.62 (1.33)	3.52 (1.41)
	Availability	4.05 (1.37)	**5.80 (1.11)**	2.38 (1.23)	4.22 (1.97)
Ease of use	Ease of understanding	**6.23 (1.01)**	5.20 (1.30)	4.70 (1.97)	4.04 (1.96)
	Intuitive operations	**6.12 (1.09)**	5.88 (1.06)	4.18 (1.85)	4.87 (1.72)
Entertainment	Visual appeal	**5.77 (1.14)**	5.35 (1.24)	4.44 (1.64)	4.20 (2.00)
	Innovativeness	4.83 (1.33)	**5.52 (1.11)**	3.98 (1.59)	4.18 (1.99)
	Emotional appeal	**5.75 (1.21)**	5.71 (1.23)	4.06 (1.88)	4.44 (2.06)
Complementary relationship	Online completeness	**6.41 (1.02)**	5.74 (1.45)	4.01 (2.04)	3.84 (2.28)
	Relative advantage	**5.78 (1.32)**	5.48 (1.43)	3.62 (1.94)	3.90 (1.98)
Situational characteristics					
Physical surroundings	On the way	2.22 (1.57)	**5.51 (2.01)**	1.33 (1.05)	4.04 (2.61)
	At school / work	3.56 (2.12)	**4.75 (2.14)**	1.25 (1.06)	3.57 (2.51)
	At home	**5.76 (1.61)**	4.96 (1.91)	4.14 (2.42)	3.76 (2.42)
Social surroundings	With friends	2.35 (1.58)	**4.56 (2.07)**	2.65 (2.07)	3.22 (2.36)
	With family / partner	4.02 (1.98)	**4.25 (2.01)**	3.36 (2.24)	3.15 (2.23)
	Alone	**5.45 (1.59)**	**5.45 (1.68)**	3.70 (2.33)	4.56 (2.36)
Temporal perspective	When I am pinched for time	3.22 (1.80)	**5.58 (1.86)**	1.85 (1.64)	3.75 (2.40)
	To bridge waiting time	2.90 (1.92)	**5.46 (2.08)**	2.54 (2.17)	4.17 (2.48)
	When I have time and ease	**5.45 (1.68)**	4.15 (2.04)	4.35 (2.43)	3.98 (2.31)
Task definition	To purchase / order	**5.61 (1.64)**	3.84 (2.03)	2.72 (2.37)	2.82 (2.11)
	To search / inform	**5.55 (1.54)**	5.26 (1.71)	2.85 (1.98)	3.23 (2.38)
	By the way	3.70 (2.00)	**4.94 (1.96)**	2.50 (1.95)	3.32 (2.44)
Antecedent states	Spontaneously	3.49 (1.69)	**5.42 (1.75)**	3.20 (1.99)	3.57 (2.33)
	When I am bored	4.24 (2.01)	**5.24 (1.88)**	3.50 (2.21)	4.28 (2.51)
	When I am comfortable	3.49 (2.01)	**5.04 (1.97)**	3.86 (2.32)	4.01 (2.44)

Note: Scales: (1) = does not apply at all; (7) = applies completely. Highest rating across e-channels is indicated in bold.

Table B-4: Evaluation of e-channel quality and situational utilization: Means (SD)

Discussion

The findings of study 1 reveal that consumers utilize a multitude of Internet-enabled devices when shopping online, supporting the expansion and fragmentation of the online retailing environment. The results show that consumers make use of 12 different devices, which can be classified into four categories of e-channels: traditional e-channel, mobile e-channel, IETV e-channel and complementary e-channel. Hence, one can conclude that a perspective of online retailing that considers only e-commerce, m-commerce, or both is no longer sufficient to represent the entire online retailing landscape. The share of users who utilize IETV and

complementary devices is quite low at the moment but might increase in the near future. The big-screen and high-resolution displays of Internet-enabled TV devices are suitable for a detailed product presentation with high-definition pictures, videos and even 3D animations.

However, at the moment neither online retailers nor IETV manufacturers seem to provide a satisfactory solution (e.g., an adequate IETV shopping app) for IETV-commerce, leading to low evaluations of qualitative attributes of the IETV-channel. The complementary e-channel comprises a heterogeneous set of devices that are relevant for retailers in offering additional services or specific products. Increasing demand for digital goods—for example, mp3-music, e-books or video-on-demand—holds opportunities for retailers to establish new business models in this field. Therefore, considering IETV-commerce and complementary e-commerce (c-commerce) as two further categories is suggested.

A comparison of the evaluation of e-channel quality and situational utilization illustrates differences across the four e-channel categories. Overall e-channel evaluation is a result of perceived qualitative benefits in a specific situational context. Therefore, the advantageousness of an e-channel or device for online shopping is a combination of the individual, the technology and context. This finding underlines that consumers evaluate and utilize e-channels not solely because of their inherent qualitative attributes, such as the usefulness or ease of use of a device, but build an overall judgment, which includes situational influences. With reference to WebQual and situational attributes, a first interpretation of the dimensions of the MDS-map is possible: dimension 1 characterizes the perceived shopping quality of an e-channel (increasing from right to left), while dimension 2 indicates the availability (increasing from top to bottom) of the devices.

4.2. Study 2: Influence of E-Channel Touchpoints on Consumers' Evaluations

Design and Sample

While the first study focused on distinction and overall evaluation of e-channels, with the second study the impact of e-channel touchpoints on the evaluation of e-channels is addressed. For this purpose, an experimental research (between-subject) design was employed to compare differences between three mobile e-channel touchpoints: (1) a regular website, (2) a mobile-optimized website and (3) a mobile shopping app. In particular, an experimental two-step laboratory design was implemented. First, attendees had to use a mobile device (an Apple iPhone was chosen, because this is a common device for mobile shopping) to finish a task (search and simulated order of a given DVD movie). In the second stage of the experiment, attendees were asked to take part in a survey to evaluate their experience with the e-channel touchpoint. To ensure realistic conditions in the different mobile environments, an existing regular website, mobile-optimized website and mobile app of the same online retailer were used.

A total of 102 volunteers (gender: 54 % female; age: $M = 30.86$ ($SD = 9.86$) years) participated in the second study. 65 % of the sample population owned a smartphone. 74 % of these smartphone owners have used the mobile device to obtain product information while 32 % of them have used the smartphone to purchase online. A convenience sample of participants was used, which included students, friends and family members of the interviewer. Participants were randomly assigned to one of the three different conditions (each cell size consisted of 34 respondents). Additionally, a control group ($N = 24$) was included, who used a common desktop PC (with Windows operating system) to visit the retail site via browser (Internet Explorer) using a keyboard and computer mouse, and which serves as a benchmark to oppose the mobile touchpoints to a touchpoint of another e-channel.

Methods

In the questionnaire, the participants had to assess six dimensions (usefulness, ease of use, enjoyment, satisfaction, privacy issues, and shopping intention) that were indicated as relevant for online shopping, each measured with multiple items (e.g., Bruner and Kumar 2005; Ha and Stoel 2008). Next to some utilitarian dimensions which were also evaluated in study 1, "enjoyment" as a hedonic shopping motive and "privacy issues" which are especially relevant for the mobile context were included (Maity and Dass 2014).

All measures were adapted from existing literature. Usefulness was adapted from Bhattacherjee (2001) and measured via three items ($\alpha = .84$)—e.g., "I would find this mobile touchpoint useful to shop online." Ease of use was also measured with three items ($\alpha = .89$) and adapted from Davis (1989)—e.g., "My interaction with this touchpoint would be understandable." Enjoyment was adapted from Venkatesh (2000) and measured via two items ($\alpha = .89$)—e.g., "It is fun to use this touchpoint to shop online." Privacy was adapted from (Ha and Stoel 2008) and measured via two items ($\alpha = .89$)—e.g., "I feel like my privacy is protected at this touchpoint." The satisfaction with the mobile touchpoint was adapted from Homburg, Koschate and Hoyer (2005) and measured with three items ($\alpha = .90$)—such as, "Overall, I am very satisfied using this touchpoint to shop online." Usage intention was measured with three items ($\alpha = .84$) and adapted from Bhattacherjee (2001)—e.g., "I would intend to continue using this touchpoint to shop online." To analyze and interpret the empirical data, ANOVA and Scheffé post-hoc were used. For this purpose, conjunct items were aggregated to reflect the related construct.

Results

The results of ANOVAs illustrate that consumers' evaluations of online shopping significantly differ across e-channel touchpoints for five out of six dimensions (see Table B-5). Only the privacy dimension shows non-significant differences across all three mobile

e-channel conditions and the traditional e-channel touchpoint ($F = 2.126$, $p > .1$). Additionally, a Scheffé post-hoc test was conducted to check for significant differences between groups of individual e-channel touchpoints. Respondents evaluated the regular website accessed through the mobile device less useful ($M = 2.80$, Scheffé post-hoc $p < .05$) than the other groups. With regard to the usefulness, the regular website accessed through the traditional e-channel ($M = 4.69$, Scheffé post-hoc $p < .05$) performed significantly better than the mobile shopping app ($M = 3.83$, Scheffé post-hoc $p < .05$), while there is no significant difference compared to the mobile-optimized website ($M = 4.18$, Scheffé post-hoc $p > .1$). Further means and Scheffé comparisons are illustrated for all dimensions and across all touchpoints in Table B-5. As already indicated through ANOVAs, the only non-significant difference holds for the privacy dimension (Scheffé post-hoc $p > .1$).

| Dimension | Mobile e-channel touchpoint (Smartphone) | | | Traditional e-channel touchpoint (PC) | F value | Part. eta² |
| | 1. Regular website | 2. Mobile-optimized website | 3. Mobile Shopping App | 4. Regular website | | |
	M (SD)	M (SD)	M (SD)	M (SD)		
Usefulness	2.80 (.90)[2,3,4]	4.18 (.66)[1]	3.83 (1.01)[1,4]	4.69 (.35)[1,3]	30.162***	.426
Ease of use	2.90 (.81)[2,3,4]	4.32 (.75)[1]	4.39 (.70)[1]	4.35 (.55)[1]	33.598***	.452
Enjoyment	2.19 (.99)[2,4]	3.24 (1.00)[1]	2.85 (1.01)[4]	3.71 (.88)[1,3]	12.634***	.237
Privacy	3.53 (1.04)	3.43 (1.00)	3.28 (.77)	3.90 (.91)	2.126 n.s.	.050
Satisfaction	2.91 (.85)[2,3,4]	4.35 (.62)[1]	4.42 (.81)[1]	4.59 (.45)[1]	37.932***	.483
Shopping intention	2.26 (.83)[4]	2.93 (1.01)[4]	2.52 (1.24)[4]	4.24 (.68)[1,2,3]	21.187***	.343
	N = 34	N = 34	N = 34	N = 24		

Note: Scales: (1) = strongly disagree; (5) strongly agree. Elevated numbers indicate significant difference (Scheffé post-hoc $p < .05$) to enumerated touchpoint. Significance Level: *** = $p < .001$.

Table B-5: Results of ANOVAs and post-hoc tests

Discussion

The findings reveal that the evaluation of an e-channel's usefulness, ease of use, enjoyment, satisfaction and usage intention is dependent on the utilized e-channel touchpoint. Related to the multichannel e-commerce framework, these findings indicate that the overall evaluation of an e-channel is affected by the utilized e-channel touchpoint and thereby depends on the development and adoption of the touchpoint to the characteristics of the device. In particular, the results show that a mobile-optimized website and mobile app both exceed the evaluation

of a regular website significantly. Interestingly, the privacy concerns barely differ across mobile touchpoints and differences are none significant. This result might be observed because security issues are affected by consumers' privacy perceptions concerning the online retailer (e.g., the privacy policy), which was the same for all touchpoints.

These observations lead to two relevant insights. First, consumers' evaluations of an e-channel need to be considered on the basis of available touchpoints to capture the variety of e-channel shopping formats. Second, retailers need to be aware of differences across touchpoints with regard to their online shopping appropriateness. One thus can conclude that online retailers should provide and communicate the availability of a mobile-customized website or mobile shopping app to their customers. Furthermore, the varying advantageousness across mobile touchpoints suggests that consumers value the possibility of utilizing and combining diverse e-channel touchpoints during the purchase process. Retailers can use this knowledge to satisfy heterogeneous consumer needs by designing and combining e-channel touchpoints with differing capabilities adapted to the characteristic of the e-channel and the situational context of the utilization.

Referring to U&G theory, the findings suggest that multi-touchpoint services might outperform the sum of individual touchpoints, by offering synergies and complementarities across e-channel touchpoints along the online customer journey. Some consumers might prefer a specific e-channel touchpoint, while others might prefer to switch across touchpoints, even on the same device.

5.   Conclusions and Implications

Research Contribution and Theoretical Implications

This research is the first effort to define and incorporate e-channels and e-channel touchpoints to investigate online consumer behavior across multiple Internet-enabled devices and diverse

touchpoints. Through the increasing multiplicity of devices and related touchpoints the online customer journey is getting more heterogeneous and thereby more complex. To cope with the changed e-commerce environment, a multichannel perspective was adopted for online retailing that constitutes the multichannel e-commerce framework.

With the multichannel e-commerce framework, an enhanced perspective of online retailing that underlines the relevance of alternative e-channels and e-channel touchpoints for consumers' perceptions and evaluations of online retailing is introduced. The main contribution for research is that the multichannel e-commerce framework helps to understand that to capture online consumer behavior not only the e-channels (devices) but also the e-channel touchpoints (formats) have to be considered—based on their attributes and the situational context. Hereby the expanded perspective provides an approach for researchers to generate more valid findings by considering the effects of e-channels and e-channel touchpoints on online consumer behavior. This contribution might also help to explain contrary findings in previous studies, e.g., the varying effects of adding an Internet channel to existing physical retail channels (Yoo and Lee 2011).

Findings from two empirical studies yield further valuable implications for marketing theory. The identification of four distinct e-channel categories from a consumer's perspective supports the advancing evolution from e-commerce (the e-channel) to multichannel e-commerce (a multiplicity of e-channels). Hence, online retailing research could benefit from integrating concepts of multichannel research. Moreover, the results support the significance of a combination of technology-related attributes and context-related situational variables to explaining the utilization of an e-channel. This result suggests that technology acceptance is dependent on the situational context of utilization—for example, time or place. Furthermore, results indicate that the range of Internet-enabled devices is quite dynamic, i.e., while new devices will appear on the scene and extend the range—for example, wearables (such as,

smart watches, head-mounted-displays)—other devices, which have reached the decline phase in their product life cycles (e.g., cellphones), will disappear. This range requires dynamic models of consumers' evaluations of online shopping devices. By addressing superordinate e-channel characteristics, this research offers a set of dimensions that are valuable for evaluating new e-channels that will appear in the market and assessing the current state of established e-channels.

Managerial Implications

The multichannel e-commerce framework and the findings of two empirical studies suggest practical implications for the introduction and adoption of new e-channel touchpoints and for the interrelation of touchpoints. Because the findings demonstrate that the evaluation of online shopping differs significantly across e-channel touchpoints, online retailers have to provide adequate touchpoints for the Internet-enabled devices that customers utilize for online activities. In particular, this result implies that retailers should consider the superordinate characteristics and capabilities of an e-channel to design an e-channel touchpoint that enhances consumers' online shopping experiences.

For example, smartphone users show an increase of 278 % in engagement with an m-commerce app when push notifications (which allows retailers to send messages or offerings to the lockscreen of a mobile device) are turned on (Localytics 2014). Moreover, the results are in line with Arts, Frambach and Bijmolt (2011) who found that consumers rather adopt innovations with less complexity and higher relative advantages, suggesting that e-channel touchpoints should be easy to use and offer a pre-eminent benefit when used to shop online.

Nevertheless, retailers should evaluate online shopping not merely on basis of the quality of technological facilities but also based on the influence of the situational context. An e-channel touchpoint should be designed to fulfill customers' needs and wishes in specific situations,

e.g., "on the go" or in a "lean back" situation at home. For example, IETV devices present new opportunities to combine TV advertising with the option to purchase the advertised goods directly via the TV. For consumers, this would make it easier to obtain additional product information or purchase spontaneously. For retailers, it would be a way to evaluate the response to a specific TV advertisement.

Lastly, the multichannel e-commerce framework suggests the relevance of a multichannel strategy for online pure-players to design, operate and combine diverse e-channels through appropriate touchpoints. In this sense, e-channel touchpoints have to be designed with regard to individual e-channel capabilities and integrated to provide a seamless online shopping experience across diverse e-channels and multiple touchpoints.

Limitations and Future Research Directions

The multichannel e-commerce framework provides first insights into how the multiplicity of e-channels and e-channel touchpoints has refined the online retailing environment. Nevertheless, limitations of the two studies and technological developments provide several issues for further investigation. The studies reported here are a first attempt to illustrate the expanded perspective of online retailing and consumers' behavior across diverse devices and touchpoints. Questions may arise regarding the methods by which they are generated and the explanatory power of the findings. Therefore, in the following, possible directions for future research are briefly discussed to advance this work and overcome its underlying limitations.

Bauer, Falk and Hammerschmidt (2006) argue that a major omission of the WebQual instrument is that hedonic aspects of online shopping (e.g., fun or enjoyment) are not included. In line with this view, the role of hedonic attributes for consumers' evaluation and categorization of an e-channel should be examined. A limitation of the second study is that a laboratory experiment was conducted to investigate consumers' evaluation of the mobile e-channel. Researchers might conduct field studies, to investigate evaluation of e-channels in

different situational contexts. With regard to the online customer journey, the role and relevance of specific e-channels and touchpoints in individual phases of the online purchase process should be considered.

From the multichannel perspective, future research could explore the effects of synergies and complementarities across e-channel touchpoints to understand the effects of interrelations across e-channels on online shopping behavior. Analyses of e-channel touchpoint evaluations on other devices, (e.g., tablet or IETV) and simultaneous utilization (e.g., tablet and IETV) could extend the findings and deliver valuable insights how and why consumers use combinations of devices and touchpoints. Experimental studies with wearable technologies— e.g., smart watches, head-mounted-displays—could investigate the relevance of these technologies for online shopping and examine utilization scenarios that help retailers to design appropriate touchpoints.

Further research might explore how personal traits of the consumer influence the evaluation of e-channels and e-channel touchpoints—for example, the role of consumer involvement toward the device. With the increasing relevance of social networks, the influence of socialized touchpoints (e.g., the "Twitter buy-button" or "Facebook shops") yields opportunities to investigate social shopping across devices. Lastly, research could replicate the two studies in other settings—for example, in other countries—to investigate whether the relevant set of Internet-enabled devices and e-channel categories varies across countries, cultures or retailers.

C. Comparative Analysis of E-Channels[6]

1.   Introduction

Worldwide mobile Internet usage is increasing and in more and more countries mobile online traffic already surpasses desktop computer generated traffic (StatCounter 2015). In fact, 80 % of the global Internet users own a smartphone and almost all smartphone owners are using the mobile device to access the Internet (GWI 2014). As a result of increased mobile Internet usage, a shift from traditional online shopping with a personal computer (PC) to an increased use of mobile shopping devices is observable. 33 % of global online shoppers indicate that they have bought online via a smartphone in the past 12 months (PayPal and Ipsos 2014). According to a recent forecast by Goldman Sachs (2014), global mobile commerce (m-commerce) sales will reach $626 billion by 2018, almost equaling total global e-commerce sales ($638 billion) generated in 2013.

The relevance of m-commerce has also been recognized by academic researchers who describe mobile retailing as "a powerful new channel format" and emphasize its importance for multichannel research (Zhang et al. 2010, p. 177). While some authors regard m-commerce as a subdomain or extension of e-commerce (e.g., Davis and Sajtos 2009) or define it simply as "M-commerce = E-commerce + Wireless Web" (Ullah and Khan 2012, p. 27), in this study it is argued that traditional online retailing and mobile online retailing are perceived and utilized as two different ways of online shopping by consumers. Neslin et al. (2006, p. 96) regard a channel as "a customer contact point, or a medium through which the firm and the customer interact." This study expands this perspective, by regarding an electronic channel (e-channel) as an individual category of devices that work as online retail

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[6] A modified version of this essay is published in: Schramm-Klein, Hanna and Gerhard Wagner (2014), "Broadening the perspective on E-commerce: A comparative analysis of mobile shopping and traditional online shopping," Marketing ZFP, 36 (2), 119–130.

channel and by viewing an e-channel touchpoint as a specific online retailing format. For this study two categories of e-channels and related touchpoints are distinguished: the traditional e-channel (a PC, providing an e-tailing website) and the mobile e-channel (a mobile device, providing a shopping app). In particular, e-commerce and m-commerce are considered as two different but still interdependent categories of online distribution channels.

Many retailers already provide diverse e-channel touchpoints for different e-channels. For example, pure online players such as Amazon or Zalando as well as traditional retailers such as H&M or Tesco provide mobile shopping applications (apps) in addition to their traditional online store (website). New e-channel touchpoints, such as mobile shopping apps, obviously differ from traditional online retailing websites in terms of e-channel characteristics. In particular, devices are heterogeneous with regard to attributes such as screen size, utilization scenario or capabilities (e.g., localization services on smartphones). While a PC usually is used at a desk and controlled via keyboard and computer mouse to access a retailer's website, mobile devices can be used almost everywhere to shop online, either by visiting a (mobile) website or, if available, by using a shopping app. In contrast, both categories of e-channels offer similar shopping functions, e.g., searching the assortment, purchasing products or reading customer reviews. In multichannel management, it is seen as a crucial first step to identify similarities and differences across alternative shopping formats to fulfill customer needs (Monsuwé, Dellaert and de Ruyter 2004). In the same manner, it is relevant to identify similarities and differences across e-channels in a multichannel e-commerce system.

Knowledge of the evaluation of traditional online retailing compared to new ways of online shopping is essential to understand the contribution of alternative e-channels to consumers' holistic online shopping experience. Therefore, the following research questions are addressed:

- Does consumers' evaluation and intention to shop online differ, depending on the utilized e-channel?

- What factors influence consumers' intention to shop online across diverse e-channels?

The first research question seeks to determine if there are significant differences in consumers' evaluations of online shopping when using diverse e-channels. This knowledge is essential for marketing practice to understand if e-channels are perceived as interchangeable (i.e., substitutable). Moreover, for researchers it is necessary to know whether online shopping is still generalizable or has to be investigated in a more differentiated way. With the second research question, the determining factors of the intention to shop online with a specific e-channel are investigated and their individual relevance is compared across e-channel categories. Marketing researchers will benefit from the knowledge whether existing models and theories for online shopping are still applicable to a system of multichannel e-commerce. For online retailers it is relevant to understand what antecedents affect the intention to purchase with an e-channel, to provide services adjusted to consumer's expectation toward the e-channel.

2. Literature Review

Prior studies on online shopping behavior are often limited to customers visiting and purchasing on a retailer's website, and thereby excluding that customers use other e-channel touchpoints for online shopping, for example mobile shopping apps (e.g., Ha and Stoel 2012; Hausman and Siekpe 2009). Findings of studies solely considering behavioral intentions toward websites are limited because they do not capture the scope of e-channel touchpoints consumers utilize nowadays. Other studies investigate consumers' intentions to shop online in general which does not capture whether shoppers use alternative e-channels and whether consumers' intentions are moderated by the employed e-channel (e.g., Liu, Forsythe and

Black 2011; McCole, Ramsey and Williams 2010). Studies that measure consumers' intentions to shop online in general tend to generalize and disregard that online shopping behavior of individuals who use different e-channels or e-channel touchpoints might vary.

The utilization of the mobile Internet, respectively, m-commerce, has received wide attention in research (e.g., Ghobakhloo, Tang and Zulkifli 2013; Koenigstorfer and Groeppel-Klein 2012) but either without considering other e-channels (in addition to the mobile channel), alternative e-channel touchpoints (such as a mobile shopping app) or not related to the determinants of online shopping intentions. Moreover, there is a wide array of studies that examine the role of the Internet channel within a multichannel framework, such as a physical retail store, a mail-order catalog, and an online store (e.g., Valentini, Montaguti and Neslin 2011; Wikström 2005). In these studies, online retailing is analyzed with a "one e-channel" perspective and the existence of alternative e-channels and their effects on consumer behavior are not considered. Some authors, however, indicate that e-commerce includes a wider range of online shopping alternatives. For example, Payne and Frow (2004) extend traditional categories of retail channels (e.g., outlets or telephony) by e-commerce and m-commerce. Rapp and ul Islam (2003) also used the term "multichannel e-commerce" to describe a retail system based on the Internet, mobile phones, and multimedia kiosks in retail stores. From a consumer's perspective the availability and combinability of alternative e-channels might be perceived as value-added service of the retailer (Zentes and Schramm-Klein 2006). In line with this view, Zhang et al. (2010) assume that the mobile e-channel will bring new challenges and opportunities for multichannel retailers and profoundly reshape the retailing landscape.

While there are numerous studies on methods to evaluate the performance of websites (e.g., Chen, Hsu and Lin 2010; Hausman and Siekpe 2009) or mobile shopping (e.g., Ghobakhloo, Tang and Zulkifli 2013; Ko, Kim and Lee 2009), there is a lack of studies that include the

varying characteristics of different e-channels. However, there are few studies that compare mobile shopping with traditional website access, using a PC. Turel and Yuan (2006) identify differences in the dynamics of e-commerce and m-commerce industries and detect structural barriers to m-commerce diffusion. The authors offer a strategic viewpoint that seeks to explain the slow diffusion and key structural barriers of m-commerce services. Sumita and Yoshii (2010) develop a mathematical model for comparing e-commerce via the traditional PC access with m-commerce. Anyhow, their intention is primarily to explore how the mobile access to the Internet enhances e-commerce and only numerical examples are given without concluding to actual behavior in m-commerce or e-commerce. Tiwari et al. (2011) use a hypercube model that includes three dimensions (technological components, business models, and stakeholders) to compare e-commerce and m-commerce. The results of their study indicate that m-commerce differs substantially from e-commerce in some technological components, yet both share a common business model for providers. The authors conclude that m-commerce should not be simplistically regarded as an extension of e-commerce.

With regard to the presented literature streams this study contributes by extending and merging existing research in the field of multichannel retailing, e-commerce and m-commerce. In particular, this research offers an approach to investigate consumers' evaluations of individual e-channels in comparison and consolidated to a retailer's multichannel e-commerce system.

3.   Theoretical Foundation and Research Model

To capture consumers' evaluation of online shopping via different e-channels, a research model has to be chosen that is applicable to mobile as well as traditional online shopping and suitable to compare both e-channel categories. For this purpose, a well-established model that

is frequently applied in both e-commerce and m-commerce, the Technology Acceptance Model (TAM, Davis 1989), is extended and tested for two categories of e-channels.

TAM builds on the Theory of Reasoned Action (TRA), which states that one's action is a function of one's intention to perform a specific behavior (Fishbein and Ajzen 1975). TRA is one of the most fundamental and influential theories of human behavior (Venkatesh et al. 2003). However, the underlying assumptions do not cover situations in which individuals may choose among alternative behavior (Sheppard, Hartwick and Warshaw 1988), such as choosing a specific e-channel to shop online. While in previous studies TAM or TRA were applied to online shopping in general or limited to a specific device, one might consider that the availability of different e-channels offers a set of alternatives that influence the intention to use an e-channel for online shopping. In TAM, the intention to use a technology is determined by one's attitude toward the technology, which is influenced by the perceived usefulness (USE) and perceived ease of use (EOU) of the technology. Usefulness refers to the degree to which consumers believe that using a technology will improve their shopping performance or productivity, while ease of use refers to perceptions of the effort to use the technology (Davis 1989; Monsuwé, Dellaert and de Ruyter 2004). This is in line with considerations of the resource-based view in consumer behavior (Kaufman and Lane 1996), which implies that the choice of channel format depends on which channel demands the least resources in terms of effort to use the channel (Wikström 2005).

Next to usefulness and ease of use, perceived enjoyment (ENJ), as an intrinsic factor, has been found to have a positive impact on the intention to use a mobile device for online shopping (Lu and Yu-Jen Su 2009). Enjoyment is defined as the extent to which using an information system is perceived as fun in its own right, aside from any consequences of its performance (Davis, Bagozzi and Warshaw 1992). In hedonic system-use settings, many studies have found that perceived enjoyment is more influential than perceived usefulness

(see Wu and Lu 2013) for a meta-analysis on effects of extrinsic and intrinsic motivators). When online shopping, individuals are in a playfulness state, i.e., they will find the interaction with the technology intrinsically interesting (Moon and Kim 2001). Hence, in the context of Internet shopping, enjoyment refers to the customers' direct experience of pleasure and joy from using the technology (Davis, Bagozzi and Warshaw 1992). Therefore, it is to assume that the use of a specific e-channel to shop online depends on the intention to choose this e-channel after weighting the ease of use, enjoyment and usefulness of all available e-channels.

The focus of this study is to measure a user's post-utilization evaluation of e-channel touchpoints across two e-channel categories. Service management literature proposes to view selling through an e-channel as an e-service process that determines online customer satisfaction (Ba and Johansson 2008). In the post-utilization stage, satisfaction is an evaluation of pre-consumption attitude (Liao, Chen and Yen 2007). Therefore, satisfaction (SAT) is included into the research model. Another reason for the inclusion of satisfaction is that most consumers already have made manifold experience with online shopping technologies. Nowadays, online shopping is widely accepted and utilized for purchases of any kind. Hence, the satisfaction with an e-channel should serve as a valid predictor of the (continued) usage intention. Satisfaction has a transient, experience-specific effect, i.e., satisfaction with the prior use of a service determines consumers' intention to repurchase a product or continue to use an e-channel (Oliver 1980). When the online shopping experience results in satisfactory outcomes, consumers are likely to continue shopping from an online retailer in the future (Shim et al. 2001). Consumers use an e-channel with pre-use expectations about its anticipated performance and evaluate the perceived performance of the online channel compared with their primary expectations about it. Accordingly, ex-post expectation might be enhanced when consumers discover new benefits from using an

e-channel beyond their ex-ante expectation. (Continued) usage intention (INT) includes the intention to (re-)use an e-channel to gain information or to make future purchases and would primarily be determined by the satisfaction with prior e-channel use (Bhattacherjee 2001).

TAM has received wide attention for predicting technology usage. However, this model did not incorporate a broader set of alternatives that might limit or increase the intention to use one technology over the others (Lee, Kozar and Larsen 2003). Therefore, to test the research model, data of consumers' evaluation of two different e-channels is used: a mobile shopping app via a mobile device, representing the mobile e-channel, and a retailer's e-tailing website via a PC, representing the traditional e-channel. For this study, usefulness and ease of use are adapted from TAM and complemented by enjoyment and satisfaction to predict the (continued) usage intentions of different e-channels. The research model is shown in Figure C-1.
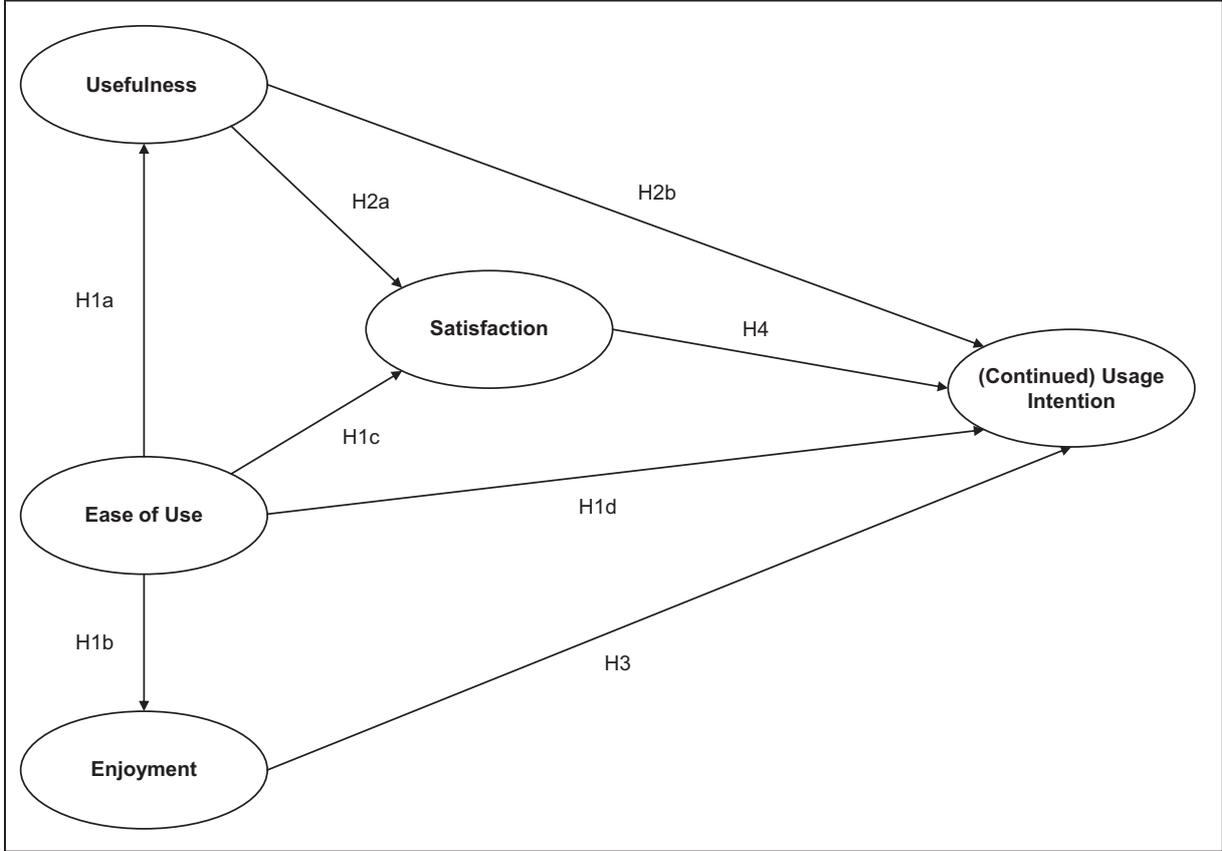
Figure C-1: Research model for comparison of e-channel usage intention

4. Hypotheses

Davis (1989) demonstrated that usefulness is positively influenced by the ease of use of a technology, and these findings were confirmed by Venkatesh and Davis (2000). Based on the results of an empirical study, Van der Heijden (2004) concludes that ease of use positively affects enjoyment, which plays a pivotal role for the user acceptance of hedonic information systems. Therefore, it is to assume that the easier an e-channel is to use, the less effort is required to handle it and thereby the more useful and joyful it will be perceived to shop online. Ease of use has been confirmed as a key factor leading to online channel satisfaction (Devaraj, Fan and Kohli 2002). In addition to the indirect effect through usefulness, enjoyment and satisfaction, most studies (e.g., Van der Heijden 2004; Venkatesh 2000) propose ease of use to have a direct impact on consumers' intention to shop online. Because consumers attempt to minimize the effort in their behavior, they tend to choose the way of shopping that is most effortless (Venkatesh 2000). Thus, the following hypotheses are postulated:

H1:   *The perceived ease of use of an e-channel has a positive effect on ...*

      a. ... perceived usefulness of this e-channel.

      b. ... perceived enjoyment with the e-channel.

      c. ... satisfaction with the e-channel.

      d. ... intention to re-use the e-channel.

Several studies have shown that usefulness is a key factor in determining consumers' intentions to adopt a new technology (e.g., Davis, Bagozzi and Warshaw 1989; Venkatesh and Davis 2000; Yu et al. 2005). In addition, Bhattacherjee (2001) indicates that the perceived usefulness of a technology is a relevant antecedent of how satisfied a user is. In research on online shopping behavior, Montoya-Weiss, Voss and Grewal (2003) suggest that overall satisfaction with a website is affected by the usefulness of the website content. Following this

view, the degree of satisfaction with an e-channel should depend on how useful the e-channel is perceived to be for online shopping. Thus, the following is hypothesized:

H2:   *The perceived usefulness of an e-channel positively affects ...*

          a. ... satisfaction with the e-channel.

          b. ... intention to re-use this e-channel.

Since TAM originally was developed to capture work-related acceptance of information systems, the model is based on a user's extrinsic motivation to use a technology (Davis 1989). For hedonic information systems, an intrinsic motivation such as enjoyment of the technology can be a key factor to determine usage intention (Davis, Bagozzi and Warshaw 1992). The positive effect of enjoyment on intention has been shown by numerous studies in consumer behavior literature. For example, Lu and Yu-Jen Su (2009) investigated factors affecting the purchase intention on mobile shopping websites and found that enjoyment, as an intrinsic motivation, affects the intention to engage in mobile online shopping, rather than an extrinsic motivation (e.g., usefulness). These thoughts lead to the following assumption:

H3:   *Consumers with a higher level of perceived enjoyment will express a higher intention to re-use the e-channel.*

In consumer satisfaction literature, a high level of satisfaction is regarded as the main antecedence for a consumer's decision to re-use a service or to re-purchase products (e.g., Cronin, Brady and Hult 2000; Oliver 1980). Merrilees and Fenech (2007) found that behavioral intentions toward the catalog channel for purchasing purposes are primarily driven by the overall satisfaction with this channel format. Hence, one might conclude that higher levels of satisfaction should reduce the perceived benefits of switching to another e-channel and thus increase re-purchase intentions of the satisfying e-channel:

H4:   *Satisfaction with an e-channel will positively influence consumers' intention to re-use the e-channel for online shopping.*

Distribution channels differ in their functions and utilization, thereby creating unique customer experiences in different stages of the buying process (Berry et al. 2010). Hence, consumers' evaluations of an e-channel in a shopping process must be considered with regard to the process and final outcome of using the e-channel (Balasubramanian, Raghunathan and Mahajan 2005). Konuş, Verhoef and Neslin (2008) indicate that the perceived utility of a channel also depends on consumers' multichannel adoption levels, varying shopping patterns, and their perceptions of channels. Moreover, customer evaluations and preferences drive channel-using intentions, e.g., the customer may prefer the e-channel that is easier to use (Neslin et al. 2006). Summing up, the following hypothesis is postulated:

H5:   *Consumers' evaluation of online shopping varies across individual e-channels with regard to (a) perceived usefulness, (b) perceived ease of use, (c) enjoyment, (d) satisfaction and (e) usage intention.*

5.   Methodology

Scenario Design and Procedure

To test the hypotheses, a scenario-based experimental laboratory study was conducted. Advantages of experimental design techniques—in comparison to the often chosen alternative of conducting an online survey—are the ability to control for the influence of extraneous factors of variation (e.g., varying devices, retailers or products) and the possibility to determine interaction effects between variables. Moreover, a realistic experimental setting allows to capture post-experience evaluations of consumers who utilized e-channels in a specific shopping situation, instead of hypothetical expectations about an unfamiliar technology or retailer. The experiment employed a 2 (PC vs. mobile device) x 2 (search vs. purchase assignment) x 2 (DVD movie vs. lever arch file) between-subjects factorial design. The first group was equipped with a PC and the second group with a mobile device to

complete an online shopping related task. As traditional e-channel, a common desktop computer with keyboard, mouse and Windows operating system was chosen. Participants used the Internet Explorer as browser to visit a regular e-tailing website. As mobile device, an Apple iPod Touch with Wi-Fi Internet connection was employed which is similar to a common smartphone and allows to employ smartphone apps. A pre-installed mobile shopping app of the same online retailer as in the PC group was utilized to access the online store. Since the mobile shopping app is adapted to the characteristics of the mobile device and because findings from essay 1 show that an app performs better than a regular website, this e-channel touchpoint was chosen for the mobile e-channel. Both shopping formats allowed the respondents to undertake the same processes and complete the whole shopping process with the mobile or traditional e-channel, respectively. However, the mobile app is adapted to features of the mobile device, e.g., to use the camera as barcode scanner to search for products. The user interface of both e-channel touchpoints is illustrated in Figure C-2.
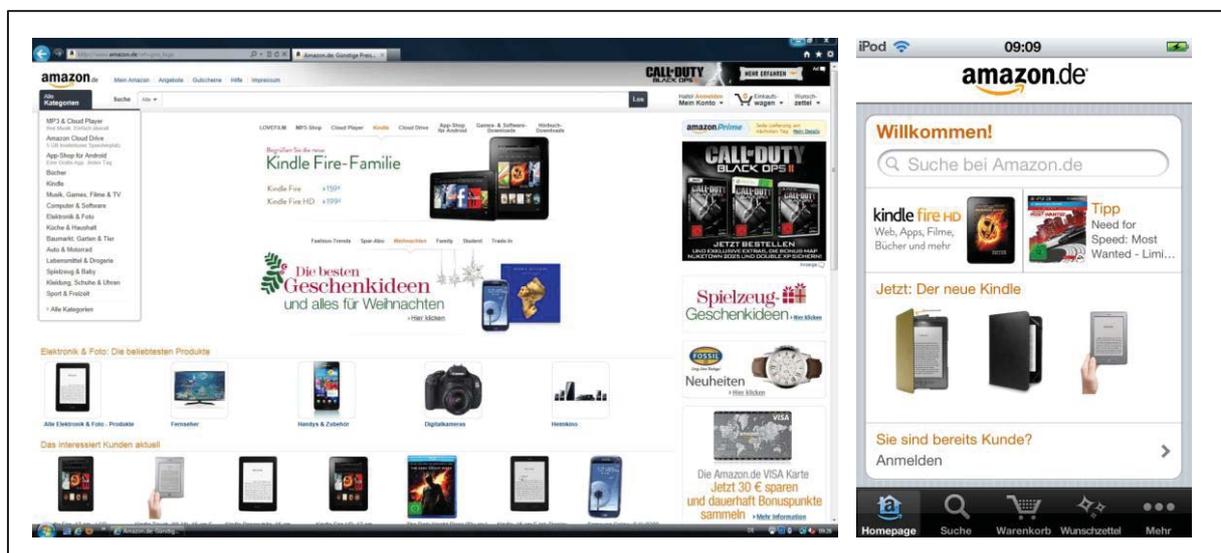
Figure C-2: User interfaces of traditional and mobile e-channel (website/shopping app)
Source: Screenshot of Amazon.de website and Amazon mobile shopping app.

The generalizability of the results may be limited by the characteristic of the assignment or the product chosen for online shopping (Churchill and Surprenant 1982). Therefore, the task

was manipulated for two different products (a DVD movie and a lever arch file) and two distinct assignments (searching a product and purchasing a product). A relevant consideration affecting the choice of products and assignments for the study was the ability and believability to shop for these goods online, respectively, to search for them in an online store. DVD movies and lever arch files are both standardized and familiar products that have a high potential to be considered when shopping on the Internet because the quality uncertainty in such products is marginal and usually no physical assistance or trial is needed (Grewal, Iyer and Levy 2004). The participants were provided with scenarios, giving them a buying (browsing) task for a DVD movie (lever arch file), and they had to use a PC (a retailer's e-tailing website) or a mobile device (a retailer's mobile shopping app) to conclude the task. The experiment was conducted in a laboratory room at a German university. As an incentive, free coffee and pastries were offered.

Sample

A total of 402 voluntary participants (German consumers) were randomly assigned to one of the eight conditions. After completing this task, the respondents answered an online questionnaire to evaluate the utilized e-channel. Accordingly, all answers were given in the post-experience context with one of the two e-channels. This approach allows to compare real experiences with an e-channel instead of hypothetical expectations. The respondents ranged in age from 18 to 57 years ($M = 23.90$, $SD = 3.48$), and 50.5 % of the participants were female. 98.5 % of the participants have already used a PC to search online for product information and 94.5 % have used the traditional e-channel for online purchases. A mobile device has been utilized by 74.1 % of the respondents to search online for product information and 34.8 % have already mobile shopped.

Measures

Questionnaire items were adapted from previous studies to fit the context of online shopping with both e-channel categories. To measure usefulness, three items from Davis (1989) were adapted (α = .83). Ease of use was measured with five items (Davis 1989) (α = .87). Two items were applied to assess the degree of enjoyment (Venkatesh 2000) (α = .91). Following Homburg, Koschate and Hoyer (2005), satisfaction was measured using three items (α = .90). Three items to measure intention to use were adapted from Bhattacherjee (2001) (α = .85). All items were assessed using 5-point Likert scales, ranging from "strongly disagree" (1) to "strongly agree" (5). A pretest with 20 respondents was conducted to assess the clarity of the items and scales. A complete list of constructs and related items is given in Table C-1.

Construct	Item	Source
A. Perceived Usefulness of the E-Channel		
Usefulness (USE)	By using the e-channel, I would improve my performance to search for products.	Adapted from Davis (1989)
	Using the e-channel to shop online is effective.	
	I would find the e-channel useful to shop online.	
B. Perceived Ease of Use of the E-Channel		
Ease of Use (EOU)	My interaction with the e-channel would be understandable.	Adapted from Davis (1989)
	Learning to operate the e-channel would be easy for me.	
	Online shopping with the e-channel would be clear.	
	It would be easy for me to find what I am looking for.	
	It would be easy for me to become skilful at using the e-channel.	
C. Perceived Enjoyment of the E-Channel		
Enjoyment (ENJ)	Using the e-channel to shop online is enjoyable.	Adapted from Venkatesh (2000)
	It is fun to use the e-channel to shop online.	
D. Satisfaction with the E-Channel		
Satisfaction (SAT)	Overall, I am very satisfied using the e-channel to shop online.	Adapted from Homburg, Koschate and Hoyer (2005)
	My personal needs and wishes concerning the use of the e-channel were satisfied.	
	Overall, the e-channel would meet my expectations.	
E. Intention to Use the E-Channel		
Intention to Use (INT)	I intend to continue using the e-channel to shop online.	Adapted from Bhattacherjee (2001)
	In the future, I intend to use the e-channel more often to shop online.	
	I will rather use the e-channel than the access via other end devices.	

Note: Items were measured on a five-point Likert scale: 1 = "strongly disagree" and 5 = "strongly agree."

Table C-1: Constructs and corresponding items

All constructs were measured as reflective constructs. For evaluation of internal consistency among the items, Cronbach's alpha was analyzed. Scale reliability was assessed using average variance extracted (AVE) and composite reliability measure. To assess convergent validity of the instrument, the common test introduced by Fornell and Larcker (1981) was performed. All factor loadings are highly significant ($p < .01$) and exceed .7, all construct reliabilities exceed .7, and average variances extracted (AVE) are higher than the .5 level, with the exception of the ease of use (AVE = .46) and intention to use (AVE = .47). Since, these values are only marginal below the recommended threshold and other studies report that an AVE higher than .4 is acceptable (Zhou, Yim and Tse 2005), the convergent validity of the measures is satisfying. To assess discriminant validity, chi-squares between the measurement model and the nested models were compared. The results of the validity assessment and scale-level reliability were satisfying.

6.   Results and Discussion

To control for significant differences with regard to the utilized e-channels, shopping assignments and two different products, analysis of covariance (ANCOVA) was conducted. E-channel and task were employed as fixed factors and product as random factor. Age, gender and experience (self-reported experience with the device) were included as covariates to test whether the evaluation of an e-channel is affected by demographic influences or personal traits. Experience with the device had a significant effect on all tested variables: usefulness ($F(1,391) = 19.422$, $p < .000$), ease of use ($F(1,391) = 44.405$, $p < .000$), enjoyment ($F(1,391) = 26.624$, $p < .000$), satisfaction ($F(1,391) = 13.181$, $p < .000$), intention to use ($F(1,391) = 19.023$, $p < .000$). A further analysis of the bivariate correlations between experience and all considered variables reveals a weak positive relationship (range: $r = .236$ to $.355$, $p < .01$),

indicating that experienced device users have a more positive evaluation and higher intention to purchase with the device.

While no significant impact of age was found, there is a significant difference between females and males with regard to enjoyment ($F(1,391) = 8.59$, $p < .01$). In the sample, females had a more positive perception of the enjoyment with both categories of e-channels. The results indicated no significant differences between the buying and browsing task or between the DVD movie and lever arch file for the employed constructs. With regard to the utilized e-channel categories, significant differences for usefulness ($F(1,2374) = 144.16$, $p < .01$), ease of use ($F(1,2322) = 23.85$, $p < .05$), and intention to use ($F(1,13951) = 1053.94$, $p < .000$) were found. Based on a comparison of means illustrated in Table C-2, it becomes apparent that traditional online shopping with a PC is preferred to mobile shopping, when both e-channel alternatives are utilized in the same context. No significant interaction effects were revealed.

	Movie DVD				Lever arch file			
	Browsing task		Buying task		Browsing task		Buying task	
	E-Channel		E-Channel		E-Channel		E-Channel	
	Traditional	Mobile	Traditional	Mobile	Traditional	Mobile	Traditional	Mobile
	Mean (SD)	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*	*Mean (SD)*
USE	4.56 (.42)	3.84 (.77)	4.36 (.69)	4.01 (.61)	4.41 (.60)	3.74 (1.00)	4.32 (.63)	3.85 (1.03)
EOU	4.34 (.50)	3.94 (.59)	4.22 (.65)	4.01 (.69)	4.16 (.71)	3.86 (1.00)	4.24 (.55)	3.90 (.79)
ENJ	3.39 (.90)	2.98 (1.01)	3.51 (.93)	2.71 (1.01)	3.11 (.99)	2.90 (1.09)	3.26 (.99)	2.93 (1.17)
SAT	4.50 (.47)	3.94 (.82)	4.11 (.80)	3.98 (.60)	4.26 (.71)	3.67 (1.12)	4.31 (.65)	3.69 (1.16)
INT	3.90 (.75)	2.68 (1.08)	3.87 (.97)	2.65 (.91)	3.78 (.80)	2.52 (1.10)	3.86 (.84)	2.69 (1.14)
N	49	51	50	50	51	50	51	50

Notes: USE = Usefulness, EOU = Ease of Use, ENJ = Enjoyment, SAT = Satisfaction, INT = Intention to Use; Items were measured on a five-point Likert scale: 1 = "strongly disagree" and 5 = "strongly agree."

Table C-2: Means and SD for each scenario

To test the research model, a covariance-based structural equation model (CB-SEM), using AMOS 21 was calculated. CB-SEM is appropriate to analyze empirical data in terms of parameter accuracy and for confirming theoretically assumed relationships as long as the sample size exceeds 250 observations (Reinartz, Haenlein and Henseler 2009). Moreover, CB-SEM provides global optimization criteria to evaluate an overall model fit (Hair et al. 2012). Several fit indices were examined to assess the fit of the hypothesized underlying

factor structure. The chi-square/degree of freedom ratio is less than three. GFI and AGFI exceeded the recommended values of .9 for GFI and .8 for AGFI. Root mean square error of approximation (RMSEA) is less than .1, and Tucker-Lewis index (TLI) and comparative fit index (CFI) both exceed .9, which indicates a good model fit. All calculated values to evaluate the model fit are given in Figure C-3 and indicate a satisfactory global fit.

Because both predictor and criterion variables were obtained from the same respondent, Common Method Variance (CMV) might bias the findings. To address the CMV issue, the recommendations suggested by Podsakoff et al. (2003) were followed. First, procedural remedies related to questionnaire and item design (e.g., to eliminate item ambiguity or to avoid social desirability) were considered. Respondents were told that there are no right or wrong answers and that they should answer all questions honestly. Second, Harman's single-factor test (for one single method factor) was conducted, to control the results for CMV, using factor analysis across all variables. Since the majority of the variance cannot be accounted for by one general factor, there is no indication for CMV. However, the validity of Harman's single-factor test has been criticized (e.g., Malhotra, Kim and Patil 2006; Podsakoff et al. 2003). Hence, as a third step, the effects of a single unmeasured latent method factor were controlled. For this purpose, a first-order factor with all of the measures as indicators has been added to the model. This approach allows to control for any systematic variance among the items that is independent of the covariance due to the constructs of interest (Podsakoff et al. 2003). Fourth, a marker variable was included in the model that is not theoretically related to the latent variables in this study (Williams, Hartman and Cavazotte 2010; Lindell and Whitney 2001). Recommendations of the retailer (if respondents have noticed product recommendations when searching for the product) was used as marker variable and measured with two items adapted from Senecal and Nantel (2004). A comparison of the "marker model" with "the no marker model" revealed no bias in substantive relations due to marker variable

variance (Williams, Hartman and Cavazotte 2010). These results suggest that the analysis is not subject to an inherent CMV in the responses to the survey.

The results of the SEM analysis for the total sample as well as the results grouped by e-channels are illustrated in Figure C-3. The findings support most of the hypothesized relationships, except for two postulated effects.
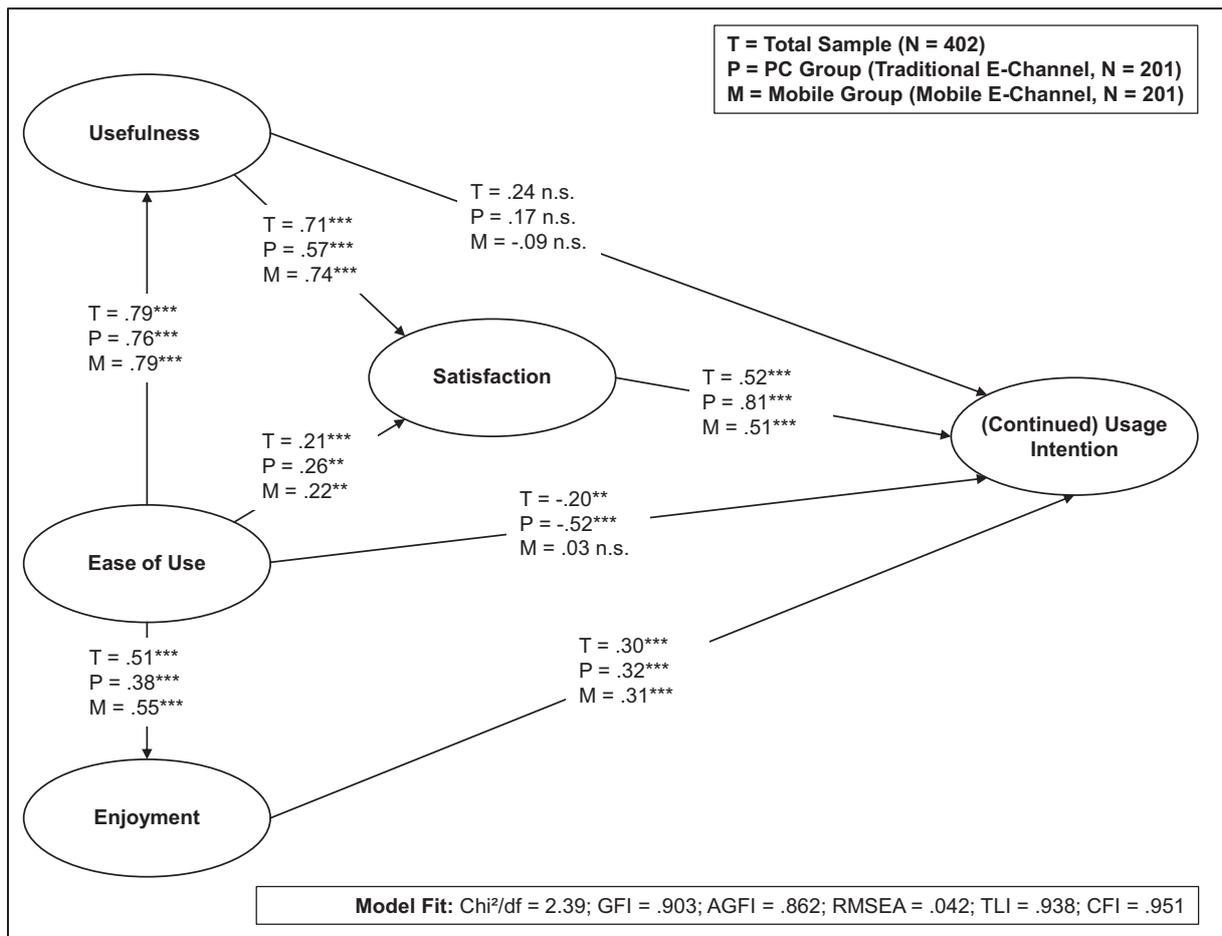
Note: Significance Level: *n.s.* = not significant, ** = $p < .05$., *** = $p < .01$.

Figure C-3: Results of the CB-SEM analysis: Total sample and by e-channel

First, instead of the assumed positive effect of ease of use on intention to use, the results indicate a negative relationship ($\beta = -.52$, $p < .01$) for the traditional e-channel as well as for the total sample ($\beta = -.20$, $p < .05$), while the effect is not significant for the mobile sample ($\beta = .03$, $p > .1$). This finding is quite surprising and would imply that the intention to use a traditional e-channel decreases the easier it is to use. However, this negative effect might be

due to the mediating effect of usefulness, satisfaction and enjoyment which are positively influenced from ease of use. In the same manner, Venkatesh et al. (2003) found that a positive effect of effort expectancy on usage intention in a model with direct effects, turns negative in a model that includes moderating influences. In the absence of a theoretical explanation, this counterintuitive relationship might be due to the effect of unconsidered variables that moderate the link between ease of use and intention to use.

Second, no significant effect of usefulness on intention to use was found. Therefore, *H2b* has to be rejected. This finding could result from the specific kind of products utilized and evaluated in the experiment, which might be of low relevance for respondents or which consumers would prefer to buy in another channel. Therefore, the application of two low involvement and low priced products as stimuli might have led to a framing effect (Tversky and Kahneman 1986). This means that respondents potentially did not express their general usage intention, but their intention to use an e-channel to purchase these specific products. Another possible reason for the insignificant relationship has been discussed by Mallat et al. (2009), who discovered that the effect of usefulness on use intention was fully mediated by the use context (such as local conditions, time pressure, availability of other shopping means).

Nevertheless, the majority of highly significant path coefficients indicate that the research framework is suitable to evaluate consumer behavior for both categories of e-channels as well as for the multichannel e-commerce system (total sample). However, a sole observation of the total sample would be attended by a loss of information, with regard to the differences across e-channels. The results of the comparative analysis of e-channels reveal interesting differences between the effects of the two sub-samples (traditional/mobile e-channel group) in the dataset. For example, the effect of usefulness on satisfaction is stronger in the total sample ($\beta = .71$, $p < .01$) and for the mobile e-channel ($\beta = .74$, $p < .01$) compared to the traditional e-channel ($\beta = .57$, $p < .01$), which underlines the relevance for a more differentiated

perspective on e-channel categories. In other cases, the effect size is quite consistent between the individual group effects. For example, the impact from ease of use on usefulness is quite similar for the total sample ($\beta = .79$, $p < .01$), the traditional e-channel ($\beta = .76$, $p < .01$) and the mobile e-channel ($\beta = .79$, $p < .01$).

Besides, it was controlled whether the revealed distinctions across path coefficients of the subsamples are statistically different (H5). To test for significant differences across e-channels, multigroup analysis was conducted (Keil et al. 2000). The same procedure was conducted by Choi, Kim and Kim (2010) to test for moderating effects of consumer experiences on the acceptance of Internet protocol television (IPTV) services or by Klapper, Schlichthorst and Schnell (2006) to analyze the long-term effect of advertising attitude. By conducting a multigroup comparison, it was possible to analyze if there is a moderating effect of the e-channel category on consumer behavior. The significance level of the observed differences between the two e-channel alternatives was calculated by using critical ratios (z-values) to identify significant differences between groups, using chi-square difference tests.

The results indicate a significant difference between the mobile channel and the traditional e-channel in terms of the link from ease of use to intention to use (z-value = -2,971, $p < .01$). One explanation might be that mobile devices provide further opportunities to use this kind of devices in a more innovative and easy way (e.g., touch screen, augmented reality, etc.) that consumers are missing when they shop online with a PC. With regard to the results of the ANCOVA presented in Table C-2, the findings indicate that ease of use is evaluated quite positive for the traditional e-channel but much weaker for mobile devices. The less positive evaluation of the mobile e-channel might be due to its limited options, e.g., the small screen size. Hence, one might assume that individuals evaluate the ease of use of one e-channel with regard to other available e-channels and that both e-channel categories are believed to be

insufficient to shop online because of their limited ease of use. For all other path relationships no further significant differences were found.

7.   Conclusions and Implications

Considering recent developments of mobile shopping, it is to assume that the multiplicity of Internet-enabled devices will reshape the Internet retailing landscape as well as online consumer behavior. Therefore, this study extends previous research by investigating consumers' evaluation of online shopping regarding the utilization of varying categories of electronic channels (e-channels). By developing and testing a research model, two different categories of e-channels were compared, a traditional e-channel and a mobile e-channel, incorporating that consumers' evaluation and intention to shop online depend on the utilized e-channel touchpoint (website and app). To capture post-experience evaluations of e-channels, instead of hypothetical expectations, a scenario-based experimental laboratory design was conducted to collect data with a data set of $N = 402$ e-channel users, composed of $N = 201$ mobile shoppers and $N = 201$ PC shoppers.

The results of SEM analyses suggest that the derived research model, an extension of TAM, provides important insights into consumers' evaluation of both employed e-channel categories. The predictive quality of the model indicates satisfactory model specification for the total sample as well as for the two sub-samples. Most paths were consistent with the derived hypotheses (see Figure C-3). Only the postulated direct effect from usefulness on intention to use was found to be non-significant for both sub-groups. Besides, the results show that ease of use is a significant but weak motivator of satisfaction, compared to the impact of usefulness, which is in line with other studies (e.g., Liao, Chen and Yen 2007). Moreover, a positive effect from enjoyment on intention to use was found for both categories of e-channels. With this knowledge, online retailers should create enjoyable shopping

environments in all online distribution channels to stimulate the intention to use an e-channel for online shopping.

Most surprisingly, the results indicate a negative relationship between ease of use and intention to use that is significant for the traditional e-channel and for the total sample, while there is no significant effect for the mobile e-channel. Because of these results, the hypothesis that ease of use has a positive effect on intention to use has to be rejected, which has been shown by numerous previous studies. However, in previous research, the effect of ease of use on intention to use was found to decrease with increasing experience of the user with the technology (e.g., Davis, Bagozzi and Warshaw 1989), and even to turn negative when moderated by other variables (Venkatesh et al. 2003). A multigroup analysis was conducted to test whether this and other differences are significant across the mobile and traditional e-channel.

The multigroup test underlined the significant difference concerning the impact of ease of use on intention to use, with ease of use having a negative influence on intention to use for the group of PC users. One explanation might be that the PC has become an instrument to perform work-related tasks in a "lean forward" mood for more and more people. Compared to touch screens and further innovative capabilities which are offered by alternative e-channel touchpoints and facilitate a "lean back" mood, a keyboard and a mouse are still easy to use but quite limited in how they can be used, which might negatively impact the intention to use the traditional e-channel.

Furthermore, the eight experimental conditions were compared to investigate for differences across the evaluation of e-channels, products and assignments by conducting ANCOVA (see Table C-2). The means show considerable differences in the evaluation of online shopping depending on the utilized e-channel. In particular, the online shopping experience with the PC was evaluated more positively than the mobile shopping experience. Based on these results, it

is to assume that consumers still perceive m-commerce as a complementary shopping potential than as a substitute for traditional online shopping devices. One reason, therefore, might be that consumers have less experience with mobile devices compared to traditional devices.

The results indicate that experience is a significant covariate with regard to the evaluation of e-channels, while there is no difference of age, and gender is only significantly different with regard to the perceived enjoyment of an e-channel. This is in line with prior studies (e.g., Koenigstorfer and Groeppel-Klein 2012; Monsuwé, Dellaert and de Ruyter 2004) that found evidence for the moderating role of the experience with a technology on the evaluation of its performance. Results suggest that easy to understand and intuitively operated shopping applications can provide customers with more control in their process of conducting online transactions which can increase customer satisfaction with mobile devices and their intention to shop mobile (Rust and Kannan 2003). Therefore, retailers should try to explain and train the handling of mobile applications or adapted websites.

Finally, there are some limitations to discuss that imply motivation for future studies. In this study, an experimental laboratory design was employed. A mobile device was used next to a traditional device, so one specific advantage of mobile shopping, namely the mobility, was not given. Building on status quo bias Falk et al. (2007) show that consumers usually choose the better known alternative, when both e-channels are available and perceived as exchangeable. Therefore, further research should investigate actual shopping behavior and consider effects of situational and contextual factors. Furthermore, the existence of multiple e-channels entails that in the information stage and actual purchasing stage, diverse e-channels can be used for both tasks (Kollmann, Kuckertz and Kayser 2012). Therefore, research should pay attention to the combined, complementary and parallel utilization of e-channels as well as online channel switching in the purchasing process.

In this study, two product categories were employed which are typical online shopping goods with standardized quality. However, usage patterns across e-channels might vary for various product categories (Steinmann and Silberer 2010). Konuş, Verhoef and Neslin (2008) tested multichannel covariates for heterogeneous product categories (mortgage, health insurance, holidays, books, computers, electronics, and clothing) selected in terms of differences in complexity, purchase frequency, and tangibility and found that multichannel-based consumer segments differ across these product categories. For example, their results revealed that shopping enjoyment has a significant effect only for clothing. Therefore, studies that involve multiple products would yield some richer insights on how evaluation of an e-channel would vary across different product categories. Further research may also consider differences between low- and high involvement goods or products that need physical assistance or pre-trial (Monsuwé, Dellaert and de Ruyter 2004).

Past studies have identified attitude toward the online store (Jayawardhena 2004) and attitude toward online shopping (Soopramanien and Robertson 2007) as predictors of intentions to buy online. Attitude toward the e-channel as well as attitude toward online shopping in general might also impact the e-channel usage intentions and should be observed in future studies. Last, it is to mention that in previous studies (e.g., Koenigstorfer and Groeppel-Klein 2012) a moderating influence of age on evaluation and utilization of a device to shop online was found. In the sample, no direct effect of age or gender was discovered, which might be due to the young average age of the respondents who participated in this study and might become significant in a sample with a balanced age pattern.

The results hold implications for theory and retail practice. With regard to the first research question, the findings show differences of the evaluation of mobile and traditional e-channel and point out that evaluation and intention to shop online is affected by the utilized e-channel category. For researchers, this underscores the need to differentiate between e-channels as

well as e-channel touchpoints when analyzing consumer online shopping behavior and substantiates that the way in which consumers access the Internet needs to be considered. Researchers and retail managers have to be aware of these differences when aiming to capture a holistic online shopping experience and when interpreting consumers' evaluation of online shopping. The less positive evaluation of the mobile e-channel compared to the traditional e-channel shows that there is still need to improve the mobile shopping environment. Mobile shopping needs to be perceived as more useful, easier to use and more enjoyable to be able to compete with traditional devices, i.e., those devices with which consumers have extensive experience and that are therefore the preferred alternative to shop online. If retailers are able to improve the mobile shopping experience, this might be a fruitful complementary online distribution channel, as the results of the SEM analysis show.

With regard to the second research question, the findings indicate that satisfaction with an e-channel is the key requirement to stimulate the intention to re-use this e-channel to shop online and that satisfaction is influenced by the usefulness and the ease of use of an e-channel. While for both e-channel categories no effect from usefulness on intention was found, the enjoyment of the mobile and traditional e-channel has an impact on the intention to re-use in equal measure. The only significant difference across both e-channels, which was revealed through the multigroup analysis, indicates a differing impact from ease of use on re-use intention. Further studies and theoretical considerations will be necessary to help to explain the negative effect that was found for the traditional e-channel. Nonetheless, this difference suggests that diverse e-channel categories do not work in the same manner and transferability across e-channels might be limited. Because more devices, such as tablet PCs or Internet-enabled TVs, provide access to the Internet and online shopping, retailers will have to manage not just one online channel but a multichannel e-commerce system. Therefore, marketing

practice will have to consider the perceived risks and benefits of each online channel as well

as how and when consumers choose one e-channel over another for online shopping.

D. Online Shopping via the Internet-enabled TV E-Channel[7]

1.   Introduction

Understanding users' acceptance, adoption, and usage of information systems is a high-priority item for marketing researchers and practitioners (Venkatesh 2000). This study focuses on consumers' attitudes and intentions toward online shopping via an Internet-enabled TV (IETV) and investigates how technological and environmental aspects influence the motivations to shop via this technology. An IETV is a TV that is connected to the Internet through either integrated Internet capability (e.g., Smart TVs) or additional hardware, such as an Internet-enabled game console, a Blu-ray player or an Internet TV box (e.g., Google TV). About one in five (18.3 %) households across 40 countries have a television connected to the Internet, and the share of IETVs is expected to grow at double-digit rates in the next several years (Digital TV Research 2013). Based on a forecast from BI Intelligence (2014), by 2017, nearly three out of four (73 %) TVs sold worldwide will provide integrated Internet access and thereby enable consumers to browse through the World Wide Web or to download IETV apps. Compared to alternative devices, such as desktop computers or mobile devices, IETVs feature other technological characteristics (e.g., screen size, handling) and a different utilization context (e.g., place of use, usage time, intended purpose). These technological and situational differences should lead to a novel online shopping experience and changed consumer behavior (Wood 2002). In this context, Venkatesh (1996) suggests that the use of a technology and attitudes toward that use are produced by the interaction between environmental and technological space. Therefore, one might assume that the exterior environment of the living room will positively impact motivations toward online shopping via an IETV. While numerous studies have investigated the motivations to use a technology to

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[7] A modified version of this essay is under review in: Wagner, Gerhard, Hanna Schramm-Klein and Sascha Steinmann (2015), "Consumers' Attitudes and Intentions toward Internet-Enabled TV Shopping," Journal of Retailing and Consumer Services.

shop online (e.g., Childers et al. 2001; Ganesh et al. 2010), research that includes the physical environment of online shopping is lacking.

Bruner and Kumar (2005) argue that a limitation of most research in this area is that it does not determine which specific factors are responsible for influencing shopping motivations. Findings from previous research suggest that the task-technology fit, i.e., the perceived congruence between the Internet and the shopping task, impact the utilitarian motivation to shop online (Klopping and McKinney 2004). However, a technology-oriented perspective that attempts to treat shopping media as "cold" information systems and excludes the role of hedonic environments is likely to fail (Childers et al. 2001). When consumers perceive the exterior shopping environment as more enjoyable or comfortable, this might stimulate their intention to shop online (e.g., to visit an online store) and influence their online shopping behavior (e.g., to spend more in an online store). Therefore, this research suggests that the hedonic motivations to use a technology to shop online are also affected by the task-environment fit.

Moreover, prior research has called for an investigation of the motivations that are likely to vary across shopping formats (e.g., Arnold and Reynolds 2003). Various forms of navigation and presentation in Internet shops can create differing perceptions of Web atmospherics (Schramm-Klein, Swoboda and Morschett 2007). With regard to the digital environment, many new Internet-enabled devices, such as smartphones, tablets and IETVs offer the opportunity to access an online store through diverse e-channel touchpoints. The standard e-channel touchpoint is an online store that consumers usually access through an Internet browser. An alternative and more versatile e-channel touchpoint is a shopping app, which can be adjusted to the characteristics of a device and provide extended capabilities (e.g., a barcode scanner for smartphones). Electronic retail formats, such as e-channel touchpoints, are expected to shift many marketplace patterns, such as hedonic and utilitarian aspects of

shopping (Wood 2002). This work extends prior research by investigating the moderating role of two distinct e-channel touchpoints (an IETV shopping app vs. the regular online store via an IETV browser) of the same online retailer for consumers' motivation to use an IETV to shop online.

In the context of IETV shopping, the following important research questions are addressed. What motivates consumers to employ an IETV for online shopping? To what extent do technological and environmental determinants affect consumers' motivations to shop online via an IETV? How is consumers' evaluation of IETV shopping affected by the e-channel touchpoints a retailer provides? By addressing these research questions, the contribution of this study is three-fold: (1) an explorative study to research which motivations affect attitudes and intentions toward online shopping via IETV in the atmosphere of the living room is conducted, (2) the influences of technological fit and environmental fit as predictors of utilitarian and hedonic motivations are examined, and (3) the moderating role of e-channel touchpoints is investigated.

2.   Theoretical Framework and Research Model

By extending a motivational model with specific concepts from fit theory, this research aims to move theory development in the direction of including technology-specific and situational-environmental factors into our understanding of the use of technology in an online shopping context (see Figure D-1). One key proposition is that the combination of task-technology fit and task-environment fit has considerable potential to explain online shopping motivations.

With regard to fit theories, the person-environment (PE) fit theory initially proposed by French, Rodgers and Cobb (1974) can serve as a starting point. PE fit theory was developed as an approach to understand the process of adjustment between organizational members and their work environments. Research on organizational PE fit has influenced the development of

the task-technology fit model (Dishaw and Strong 1999). Based on the assumptions of the task-technology fit theory, the use of a technology results in different outcomes depending on its configuration and on the task for which it is used (Goodhue and Thompson 1995). Users will choose the technology that enables them to complete a task with the greatest benefit, i.e., the technological system will be chosen based on which capabilities best match the demands of the task (Dishaw and Strong 1999). The concept of task-technology fit implies that consumers do not merely evaluate a technological system (i.e., the hardware) but rather evaluate particularly the benefit derived from the system's capabilities (i.e., the software), such as an e-channel touchpoint. Therefore, consumers' acceptance and adoption of an IETV as an alternative device for online shopping might depend on the ability of available e-channel touchpoints to support the shopping task.

Lewin (1935) suggests that behavior is a function of the whole situation, which is the fit between the person and his or her environment. Based on this assumption, one might argue that when consumers utilize a technology for online shopping, the "whole situation" is a combination of the technological and physical environments. The theory of work adjustment (TWA) introduced by Lofquist and Dawis (1969) proposes that fit is a dynamic process in which a person and his or her work environment constantly adjust to each another. Pervin (1987) adapted TWA to educational psychology and added that a person searches the environment for opportunities to satisfy his or her goals. Accordingly, in the context of fit theory, consumers select and manipulate environments to achieve their goals (Pervin 1992). Based on these considerations and derived from the conceptualization of task-technology fit, the task-environment fit is introduced and defined as the congruence between a technology and the external environment in which the technology is utilized to perform a task. In the context of online shopping, task-environment fit results from the fit between the task (or goal) to shop online and the physical environment. Hence, this research suggests that consumers'

motivations to shop online via an IETV should be enhanced through the living room atmospherics that create a pleasurable "lean back" atmosphere and thereby a comfortable exterior shopping environment.

Drawing on Deci's motivational theory (Deci 1975) and on the motivational model of technology acceptance (Davis, Bagozzi and Warshaw 1992), hedonic and utilitarian motivations should affect a consumer's attitude toward using a technology to shop online. While some consumers may shop online primarily for utilitarian goals, others may particularly appreciate the hedonic aspects of online shopping (Huffman and Houston 1993). Hence, both goals may affect the attitude toward using a technology for online shopping. Utilitarian motivations to use a new technology have been widely examined through Davis' (1989) technology acceptance model (TAM). In TAM, which builds on the theory of reasoned action (TRA), the intention to use a technology is determined by one's attitude toward the technology, which is influenced by the perceived usefulness and perceived ease of use of the technology. As previous research demonstrates, shopping convenience functions as a valid extrinsic determinant of consumers' online shopping intention (e.g., Childers et al. 2001; Verhoef and Langerak 2001). In this context, convenience is a utilitarian benefit resulting from an online shopping opportunity that helps consumers to save time and effort. Thus, convenience is included in the IETV shopping model. Because TAM was originally developed for work-related contexts, Davis, Bagozzi and Warshaw (1992) added enjoyment as predictor to capture the hedonic motivation to use a technology. With regard to the "lean back" atmosphere of the living room, as another hedonic variable comfort, which has been found to motivate shopping behavior, is also added to the research model (Wang 2004). Comfort is commonly understood as the "self-conscious satisfaction with the relationship between one's body and its immediate physical environment" (Crowley 1999, p. 750). Dellaert, Arentze and Timmermans (2008) suggest that consumers include the benefit of

"feeling comfortable" in their decision for a shopping location. Hence, comfort reflects a pleasant psychological state resulting from the comfortable physical environment of the living room. Moreover, this research proposes that usefulness, ease of use and convenience as utilitarian shopping motivations are mainly a result of task-technology fit, while enjoyment and comfort as hedonic motivations are a consequence of task-environment fit. Figure D-1 illustrates the research model which is based on the above presented theories and includes the hypotheses which are derived in the following section.

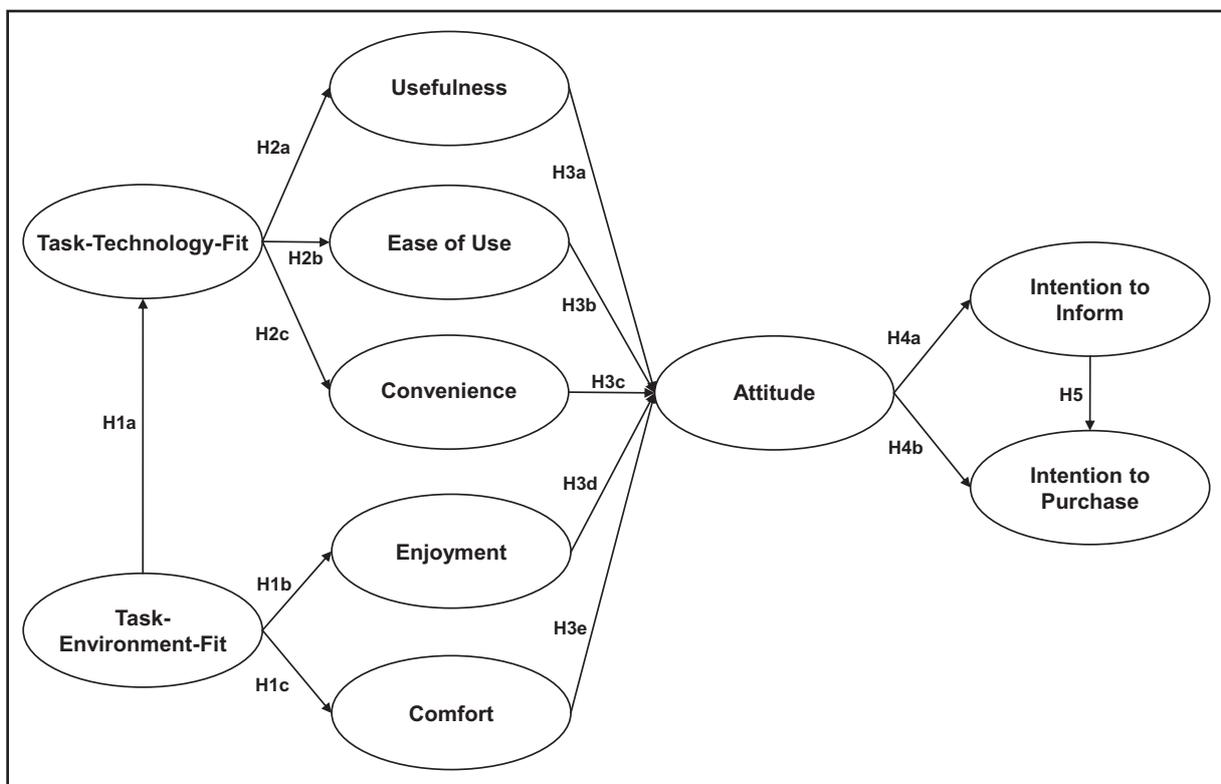**Figure D-1: Research Model for IETV shopping intentions**

3.   Hypotheses

Task-Environment Fit

Environmental cues of the shopping atmosphere can enhance or detract the customer from the purchasing process (Sharma and Stafford 2000). When shopping online, there are

environmental stimuli external to the shopper that consist of various elements of the physical atmosphere (Jang and Namkung 2009). Robinson et al. (2007) suggest that situational factors such as the physical environment may be important in the study of online shopping motivations. As consumers choose different stores on the basis of situational conditions and the task definition they derive, their perception of the environment may also affect the perceived fit between the task and the technology (van Kenhove, Wulf and van Waterschoot 1999). Mathwick, Malhotra and Rigdon (2002) indicate that fit between a consumer's shopping goals and the properties of the retail environment may have value-enhancing effects. In particular, it is to assume that the "lean back" atmosphere of the living room positively influences hedonic motivations to use an IETV for online shopping. Drawing on PE fit theory, it is likely that a high level of task-environment fit will affect hedonic motivations such as the enjoyment and comfort of online shopping. Hence, the following hypotheses are postulated:

H1:   *The greater the perceived task-environment fit is, ...*

     a. ... the greater consumers' perception of task-technology fit will be.

     b. ... the greater consumers' perception of the enjoyment of IETV shopping will be.

     c. ... the greater consumers' perception of the comfort of IETV shopping will be.

Task-Technology Fit

The perception of the usefulness and ease of use of a technology depends on characteristics of the technology, e.g., performance and freedom from defects; they are also an outcome of the intended use, i.e., the task. For example, the evaluation of the usefulness, ease of use and convenience of an IETV might differ between whether it is used to watch TV or to shop online. Consumers continue to use a technology when it delivers a good fit for the tasks it supports (Larsen, Sørebø and Sørebø 2009). Klopping and McKinney (2004) examined a model that combined task-technology fit constructs with TAM for an e-commerce context and

empirically validated that the perceived task-technology fit determines usefulness and ease of use. Childers et al. (2001) argue that perceptions of the convenience of a technology are related to the facilitation of the accomplishment of a shopping task. Therefore, it is proposed that:

H2:   *The greater the perceived task-technology fit is, ...*

        a. ... the greater consumers' perception of the usefulness of IETV shopping will be.

        b. ... the greater consumers' perception of the ease of use of IETV shopping will be.

        c. ... the greater consumers' perception of the convenience of IETV shopping will be.

Motivations to use an Internet-enabled device to shop online

In literature of technology acceptance and adoption, both utilitarian and hedonic aspects of technology use have been found to be relevant shopping motivations that impact a consumer's attitude toward online shopping (e.g., Bruner and Kumar 2005; Childers et al. 2001). If consumers perceive a technology as useful, i.e., an advantageous and effective way to shop online, they generally develop a positive attitude toward its use for online shopping (Kim and Forsythe 2008). The easier an online shopping technology is to use, the less effort is required to handle it and, therefore, the use of the technology to shop online will be perceived as more attractive (Monsuwé, Dellaert and de Ruyter 2004). Rohm and Swaminathan (2004) found that convenience is a significant motivating factor for online shopping. Empirical findings indicate that intrinsic motivations such as the enjoyment or comfort of technology utilization can determine a consumer's attitude toward the technology (Childers et al. 2001). These thoughts lead to the following hypotheses:

H3:   *A customer's more positive attitude toward online shopping via an IETV ...*

        a. ... is a consequence of a higher level of perceived usefulness of IETV shopping.

        b. ... is a consequence of a higher level of perceived ease of use of IETV shopping.

c. ... is a consequence of a higher level of perceived convenience of IETV shopping.

d. ... is a consequence of a higher level of perceived enjoyment of IETV shopping.

e. ... is a consequence of a higher level of perceived comfort of IETV shopping.

Drawing on the theory of reasoned action (Fishbein and Ajzen 1975), the attitude toward an online shopping technology should influence a consumer's intention to use it to shop online. In particular, the attitude toward using an information system has been found to mediate the relationship between motivational factors and the behavioral intention (Bruner and Kumar 2005). With regard to the online shopping intention, Klopping and McKinney (2004) suggest that online shopping should be understood as a combination of product information search activities and the actual purchase. Therefore, it is postulated that:

H4:   *The attitude toward online shopping via an IETV ...*

a. ... affects the intention to use an IETV to search for information.

b. ... affects the intention to use an IETV to make purchases.

Consumers might visit an online store not only because they intend to conduct a purchase but also because the information process itself might be perceived as a beneficial activity (Childers et al. 2001). From a multichannel perspective, this process can be seen as a relevant pre-purchase activity of the customer, leading to a purchase in the same or another sales channel. In line with this view, several studies empirically validate that getting product information from a retailer's website positively influences the intention to purchase a product from that retailer (Pavlou, Fygenson and Mendel 2006; Shim et al. 2001). Hence, it is to assume that:

H5:   *Consumers' intention to use an IETV to search for information positively affects the intention to use an IETV to make purchases.*

Moderation of the e-channel touchpoint

Henseler and Fassott (2010) indicate that relationships that hold true regardless of the context factors are often trivial, i.e., scientific knowledge could be achieved if the circumstances under which a relationship is stronger or weaker are identified. With regard to the evaluation of an online shopping technology, it is likely that consumers behave differently across varying shopping formats (Wood 2002). Referring to Scott's (1981) contingency theory, consumers' perceptions might depend on the degree of the adaption of an e-channel touchpoint to the characteristics of the task and the contextual utilization. Hence, an adapted e-channel touchpoint such as an IETV app should provide a better shopping experience and lead to a more positive evaluation of IETV shopping. Thus, the following hypotheses are proposed:

H6: *The utilized e-channel touchpoint moderates ...*

a. ... consumers' evaluation of the constructs under investigation, resulting in a more positive evaluation of IETV shopping when using the IETV app.

b. ... the relationship between the constructs under investigation, resulting in stronger effects between constructs when using the IETV app.

4.   Methodology

Research Design

In order to test the proposed hypotheses, an experimental design was implemented. Bagozzi and Yi (2012) indicate that representations of causal relationships founded on experimental data come closer to achieving the designation to support causal claims, while those arising only from survey research are given less credence as causal. Therefore, to investigate consumers' evaluation of IETV shopping, a quasi-experimental field setting was developed and conducted as a between-subjects design across two e-channel touchpoints. An Internet-enabled Samsung Smart TV (UE46F8090) was employed in a living room to create an

authentic utilization scenario within a typical "couch atmosphere." A laboratory study might have affected the evaluation of the IETV shopping experience because in an artificial laboratory setting, subjects might behave in a more work-related "lean forward" mood. Hence, participants were personally invited to the investigators' home to test the online shopping functionality of an Internet-enabled TV in a homely environment. This proceeding allowed participants to evaluate online shopping via an IETV on the basis of their actual interaction with the technology and the living room environment rather than on the basis of a hypothetical shopping scenario.

Note: The "ex libris" online store (illustrated on the left side) is accessible via www.exlibris.ch and the "ex libris" IETV app (illustrated on the right side) is available from the Swiss Samsung TV app store.

Figure D-2: Employed IETV e-channel touchpoints

Source: Screenshots of www.exlibris.ch and ex libris Samsung Smart TV shopping app (provided by ex libris).

An online multimedia retailer was selected because the goods offered (e.g., books, movies, software or games) are typical for online purchases (Szymanski and Hise 2000) and the online store of the retailer was accessible via a specific IETV shopping app. Moreover, these product categories are of relatively low cost and are perceived as having low risk, so it is appropriate for initial online shopping via a new device (Zaichkowsky 1985). Moreover, this IETV shopping app was the only IETV-specific e-channel touchpoint available in the study's market area, which underlines the novelty of this retail format. Each e-channel touchpoint accessed the same online store even though they appeared somewhat differently due to their design and navigation (see Figure D-2). The browser format has a typical web store

appearance, similar to Amazon.com and other media online stores, which is optimized for computer screens and keyboard/mouse control. The IETV shopping app is adapted to utilization via a TV; it is more similar to an on-screen menu or a smartphone app (e.g., less text, bigger icons, etc.) than to a typical online store.

Task and Procedure

Respondents visited the online store of "ex libris" (a Swiss online retailer for media products), and they were randomly assigned to one of the two experimental conditions: to the integrated browser via an IETV (group 1) or to the "ex libris" IETV shopping app (group 2). The task included five steps, which were given to the respondents in the form of a written task description and which included some browsing and purchasing activities. On average, respondents needed 10.45 minutes (*SD* = 4 min.) to perform the IETV shopping task. A *t*-test revealed no significant difference between the two experimental conditions in matters of the length of time to complete the tasks (*t* = .692, *p* = .492). By conducting the task, participants should gain enough IETV shopping experience to answer a self-administered questionnaire referring to online shopping via an IETV.

The volunteers could use three input devices (separately or simultaneously): a standard TV remote, a Samsung "Smart Touch" control and a Samsung IETV keyboard. The accomplishment of the complete task was possible with every one of the three input controls, and participants were advised to use as many input controls as they liked and to switch across controls when perceived as beneficial. Through this realistic utilization condition, the restrictions and disadvantages of individual input controls should be diminished. Aside from the participants, only a trained interviewer, who was familiar to the subjects, was present in the living room. Participants were seated on a couch in front of an IETV set and were told that they were about to take part in a study on the use of an IETV.

Measures

To empirically test the hypotheses, established multi-item scales from previous studies were adapted to the context of the study (see Table A-1). A small sample ($N = 32$) pretested the generated questionnaire with respect to the understanding and clarity of items. Minor changes in wording were made based on this pilot test. Task-technology fit was operationalized via a three-item scale adapted from Klopping and McKinney (2004), and it measured the fit between the shopping tasks and the appropriateness of the IETV for online shopping ($\alpha = .83$). The task-environment fit was conceptualized as the fit between the shopping tasks and the ambience of the real-world shopping environment and was measured via a four-item scale adapted from Sharma and Stafford (2000) ($\alpha = .92$).

Usefulness was operationalized via a four-item scale adapted from Davis (1989), and it measured the degree to which using the IETV would improve user online shopping performance ($\alpha = .89$). Ease of use was conceptualized as the process involved in using the IETV and was operationalized via a three-item scale adapted from Davis (1989) ($\alpha = .92$). Convenience was operationalized via a two-item scale adapted from Ko, Cho and Roberts (2005), and it measured the degree to which using an IETV is seen as convenient in that it saves time and effort ($\alpha = .84$).

Enjoyment was conceptualized as the extent to which the activity of using the IETV for shopping is perceived to provide reinforcement in its own right and was measured by a five-item scale adapted from Childers et al. (2001) ($\alpha = .92$). Comfort was operationalized via a two-item scale, and it measured the degree to which using the IETV for online shopping is seen as increasing feelings of comfort (Chowdhury, Reardon and Srivastava 1998) ($\alpha = .89$). Attitude toward the technology was conceptualized as an overall affective evaluation that ranges from extremely positive to extremely negative and was measured via a six-item semantic differential adapted from Batra and Ahtola (1991) ($\alpha = .92$).

Construct	Item	SL	CR	AVE
Task-Technology Fit (Klopping and McKinney 2004)			.90	.74
	The IETV is accurate enough for shopping purposes.	.88		
	The IETV is up to date enough for shopping purposes.	.78		
	The IETV is pretty much what I need to shop online.	.93		
Task-Environment Fit (Sharma and Stafford 2000)			.94	.81
	The environment of the living room would be a pleasant place to shop online.	.88		
	The environment of the living room has a pleasant shopping atmosphere.	.92		
	The environment of the living room is attractive for online shopping.	.93		
	The environment of the living room is placid to shop online.	.87		
Usefulness (Davis 1989)			.92	.75
	IETV shopping would improve my shopping productivity.	.79		
	IETV shopping would enhance my effectiveness in shopping.	.91		
	IETV shopping would be useful in buying what I want.	.88		
	IETV shopping would improve my shopping ability.	.87		
Ease of Use (Davis 1989)			.95	.86
	IETV shopping would be clear and understandable.	.91		
	IETV shopping would not require a lot of mental effort.	.93		
	The IETV would be easy to use to shop online.	.94		
Convenience (Ko, Cho and Roberts 2005)			.93	.86
	IETV would allow me to get what I want with less effort.	.93		
	Using an IETV would make my shopping less time consuming.	.92		
Enjoyment (Childers et al. 2001)			.94	.75
	Shopping via IETV would be fun for its own sake.	.92		
	Shopping via IETV would make me feel good.	.90		
	Shopping via IETV would be enjoyable.	.86		
	Shopping via IETV would be entertaining.	.83		
	Shopping via IETV would be interesting.	.82		
Comfort (Chowdhury, Reardon and Srivastava 1998)			.95	.90
	Using an IETV to shop online would be comfortable.	.95		
	Using an IETV would be a comfortable way to shop.	.95		
Attitude (Batra and Ahtola 1991)			.94	.73
	Bad / Good	.90		
	Inferior / Superior	.78		
	Unpleasant / Pleasant	.85		
	Poor / Excellent	.88		
Note: Measured on a seven-point semantic differential	Not Worthwhile / Worthwhile	.89		
	Not Useful / Useful	.81		
Intention to Inform (Pavlou 2003)			.96	.89
	Given the chance, I intend to use an IETV to search for product information.	.95		
	Given the chance, I expect to browse for products through an IETV in the future.	.95		
	It is likely that I will search for product information with an IETV in the near future.	.93		
Intention to Purchase (Pavlou 2003)			.99	.96
	Given the chance, I intend to use IETV to conduct product purchases.	.98		
	Given the chance, I expect to purchase through an IETV in the future.	.98		
	It is likely that I will transact with an IETV in the near future.	.98		

Notes: SL = standardized loadings, CR = composite reliability, and AVE = average variance extracted. Items were measured on a seven-point Likert scale, where 1 = "totally disagree" and 7 = "totally agree," unless indicated otherwise.

Table D-1: Item measures, validity and reliability

Intention to inform and intention to purchase were each operationalized via a three-item scale adapted from Pavlou (2003), and they measured the intention to engage in information exchange (α = .94) and to complete a transaction by purchasing a product (α = .98), respectively. With the exception of attitude, which was measured on a seven-point semantic differential, all constructs were measured using a seven-point Likert scale ranging from (1) = "totally disagree" to (7) = "totally agree." The constructs and items are given in Table D-1.

Convergent validity was assessed by inspecting the standardized loadings of the measures on their respective constructs (Chin 1998). All measures were found to exhibit standardized loadings exceeding the cutoff value of .7 (Hulland 1999). Reliability was evaluated by calculating the means of composite scale reliability (CR) and average variance extracted (AVE) (Chin 1998). For all measures, the CR exceeded the cutoff value of .7, and the AVE was well above the cutoff value of .5 (Fornell and Larcker 1981). Furthermore, the discriminant validity of the measures was tested, i.e., if a construct shares more variance with its measures than it does with other constructs in the model (Chin 1998). The square root of the AVE exceeds the intercorrelations of the construct with any other construct in the model (Fornell and Larcker 1981). For multicollinearity was controlled by calculating variance inflation factors that are well below the critical value of 5 and tolerance values that exceed the cutoff value of .2 (Hair, Ringle and Sarstedt 2011).

Sample

The sample consists of N = 193 German consumers who volunteered to attempt to use an IETV in the living room of a familiar person (the interviewer) to support an experiment: 96 participants conducted the online shopping task via the "ex libris" IETV shopping app, and 97 participants did so via the integrated IETV browser. Using a German sample population to evaluate a Swiss online retail site is advantageous because there should be no effects of

experience with the retailer with regard to such dimensions as loyalty or trust, which could affect the evaluation of online shopping. Furthermore, there is no language barrier because the national language of both countries is German, and the countries are culturally and economically quite similar. Of the respondents, 51 % were female, and the average age of the sample was 31.7 years (SD = 10.3 years), ranging from 16 to 70 years. Of the participants, 85 % used the Internet at least once per week to search for products or product-related information and about one-third (34 %) shopped online at least once per week. With regard to the utilized input controls, only 19 % made use of the standard remote control, 76 % utilized the "Smart Touch" control, and 93 % used the IETV keyboard. Of the participants, 24 % used only one input device, 64 % made use of two and 12 % used all three input devices to accomplish the task. As assumed, the majority of participants (99 %) had never purchased at the Swiss retailer "ex libris."

Data Analysis

To test hypotheses H1 to H5, Structural Equation Modeling (SEM) was utilized because this methodology allows to test the relationships between the variables of a complete model (Hair et al. 2012). SEM procedures allow the researcher to remove the biasing effects of random and correlated measurement errors on the outcomes of the experiment and to examine processes that may account for changes in the observed outcome variables (Russell et al. 1998). When applying SEM, researchers must consider two types of methods: covariance-based techniques (CB-SEM) and variance-based partial least squares techniques (PLS-SEM) (Hair et al. 2012). PLS-SEM was chosen because the focus of this study was on explaining and attributing variance to the two e-channel touchpoints and because the sample numbered fewer than 200. To apply PLS-SEM, the guidelines of Hair et al. (2012) were followed.

To test for significant differences across the evaluation of e-channel touchpoints (H6a), an analysis of variance (ANOVA) was conducted. Deng et al. (2005) suggest that the use of

multigroup analysis in SEM is an appropriate method to complement ANOVA. Multigroup analysis in SEM can be used to compare relationships between constructs across different groups (e.g., Schramm-Klein, Morschett and Swoboda 2008). Steenkamp and Baumgartner (2000) indicate that when latent variables are involved, multigroup analysis may provide a rigorous test of differences in structural weights across groups. Therefore, the dataset for the PLS multigroup analysis was split to compare the relationships between consumers who used the IETV shopping app and consumers who visited the online store via the IETV browser. This allows to test for significant differences between all relationships between variables across the two experimental conditions (H6b). The software packages SPSS (Ver. 22) and smartPLS 2.0 (Ringle, Wende and Will 2005) were chosen to conduct the analyses.

The recommendations suggested by Podsakoff et al. (2003) were followed by incorporating procedural remedies to control for common method bias (CMB). For example, a marker variable (satisfaction with school education adapted from Arnett, German and Hunt 2003) was included in the questionnaire; this variable is theoretically unrelated to the latent variables in the model. The "marker model" was compared with "the no marker model" and the results of the comparison suggest that the analysis is not subject to CMB.

5.   Results

The results of PLS-SEM analysis to test hypotheses H1 to H5 are illustrated in Figure D-3. The findings support most of the hypotheses with the exception of H3b. No significant effect of ease of use on attitude ($\beta = -.018$ *n.s.*) was found. However, Davis, Bagozzi and Warshaw (1989) empirically showed that the influence of ease of use on intention to inform decreases with a user's increasing experience with a technology. Venkatesh (2000) suggests that in the case of ease of use about a specific system, individuals are driven by their general beliefs, i.e., ease of use of a specific system is strongly anchored to general beliefs about computers; these

beliefs are system independent. As most consumers are already familiar with online shopping as well as the handling of an IETV device, which is quite similar to a traditional TV (e.g., use of remote control), these experiences might be adapted to IETV shopping.
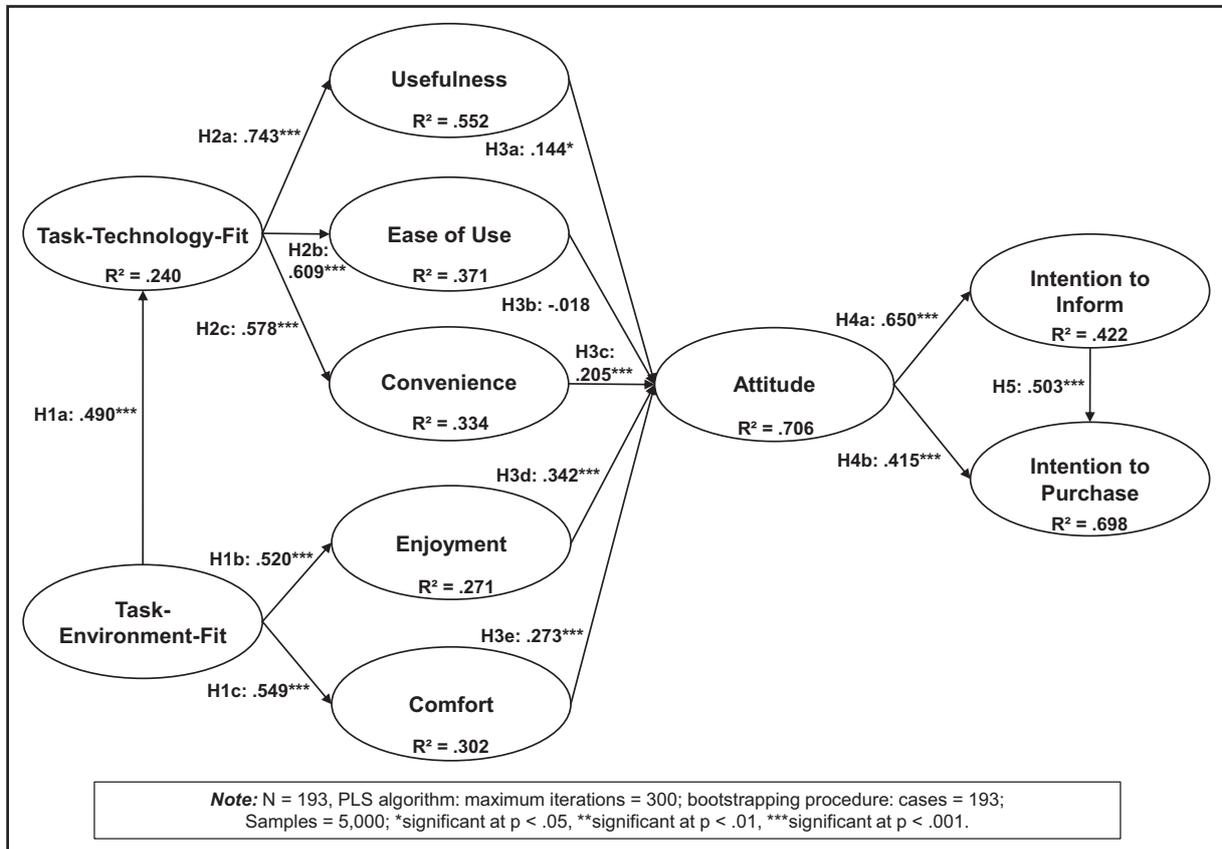
Figure D-3: Results of PLS-SEM analysis for IETV shopping model

With regard to the effects of external factors, task-environment fit is a relevant predictor of enjoyment (β = .520***) and comfort (β = .549***), and it affects task-technology fit (β = .490***). The findings reveal that task-technology fit has a strong influence on usefulness (β = .743***), ease of use (β = .609***) and convenience (β = .578***). This indicates that the motivation to use a device for online shopping is affected by the characteristics of the technology as well as by the environmental context. The attitude toward IETV shopping is primarily influenced by hedonic shopping motivations enjoyment (β = .342***) and comfort (β = .273***) and less by the utilitarian motivations usefulness (β = .144*) and convenience (β = .205***). This might be due to the substitutional character

of an IETV, i.e., online shopping can also be accomplished via other devices (e.g., PC), but shopping in the living room is an enjoyable and comfortable alternative. Attitude has a stronger influence on intention to inform (β = .650***) than on intention to purchase (β = .415***), while intention to inform also impacts intention to purchase (β = .503***) significantly. This finding indicates that the IETV would predominantly be used to search for product information, but when the pre-purchase phase is accomplished via the IETV, the intention to purchase is likely.

The second step of the analysis involved conducting ANOVAs for each construct as a dependent variable and the e-channel touchpoint as a fixed factor to test for significant differences in the evaluation of IETV shopping (H6a). For this step, all constructs are represented by a single index calculated by averaging the items on the multi-item scales. The results of ANOVA are illustrated in Table D-2.

Construct	Mean (SD)	IETV E-Channel Touchpoint		F-Value	p-Value
		App Mean (SD)	Website Mean (SD)		
Task-Technology Fit	**4.86 (1.38)**	**5.05 (1.39)**	**4.68 (1.35)**	**3.419**	**.066**
Task-Environment Fit	5.29 (1.41)	5.35 (1.40)	5.23 (1.42)	.394	.531
Usefulness	**4.41 (1.62)**	**4.73 (1.49)**	**4.08 (1.68)**	**8.073**	**.005**
Ease Of Use	**5.23 (1.61)**	**5.43 (1.65)**	**5.03 (1.56)**	**2.996**	**.085**
Convenience	**4.23 (1.83)**	**4.46 (1.89)**	**4.01 (1.74)**	**3.077**	**.081**
Enjoyment	**4.24 (1.55)**	**4.48 (1.57)**	**4.00 (1.50)**	**4.534**	**.035**
Comfort	**4.92 (1.71)**	**5.14 (1.67)**	**4.70 (1.73)**	**3.150**	**.078**
Attitude	**4.58 (1.37)**	**4.79 (1.36)**	**4.37 (1.35)**	**4.503**	**.035**
Intention to Inform	4.38 (1.92)	4.50 (1.95)	4.27 (1.90)	.699	.404
Intention to Purchase	4.06 (2.06)	4.29 (2.11)	3.85 (2.00)	2.205	.139
N	193	96	97		

Note: Items were measured on a seven-point Likert Scale: (1) *Strongly Disagree* to (7) *Strongly Agree*.
Attitude was measured using a seven-point semantic differential: (1) *Negative Evaluation* to (7) *Positive Evaluation*.

Table D-2: Construct means, SD and ANOVA for the IETV e-channel touchpoint

As shown, ANOVA models indicate significant mean differences (bold rows) for seven of ten constructs: task-technology fit ($F(1,191)$ = 3.419, p < .1), usefulness ($F(1,191)$ = 8.073, p < .01), ease of use ($F(1,191)$ = 2.996, p < .1), convenience ($F(1,191)$ = 3.077, p < .1), enjoyment ($F(1,191)$ = 4.534, p < .05), comfort ($F(1,191)$ = 3.150, p < .1) and attitude ($F(1,191)$ = 4.503, p < .05). As hypothesized, in all significant cases, the IETV shopping

experience via the app is more positively evaluated than shopping by accessing the online store via a browser. No significant difference of task-environment fit ($F(1,191) = .394$, $p = .531$) across e-channel touchpoints was found, which is not surprising because task and environment were the same across groups. Moreover, findings revealed no significant differences between intention to inform ($F(1,191) = .699$, $p = .404$) and intention to purchase ($F(1,191) = 2.205$, $p = .139$) across e-channel touchpoints. To test for significant differences among path coefficients across e-channel touchpoints (H6b), a multigroup analysis based on a parametric approach was conducted as the third step of the analysis (Keil et al. 2000). This procedure includes calculating t-tests across two shopping formats (samples) with m (n) for the number of observations in sample 1 (2), and it is summarized as follows:

$$t = \frac{path_{sample1} - path_{sample2}}{\left[\sqrt{\frac{(m-1)^2}{(m+n-2)} * S.E._{sample1}^2 + \frac{(n-1)^2}{(m+n-2)} * S.E._{sample2}^2} \right] * \left[\sqrt{\frac{1}{m} + \frac{1}{n}} \right]}$$

Significant differences across paths (β-values) of the sub-models reveal changes in the relationship between the predictor and response variables depending on the utilized e-channel touchpoint. The results of the multigroup analysis indicate that four effects are significantly different across e-channel touchpoints (bold rows), which will be discussed in detail (see Table D-3).

Relationship	App β	Browser β	|Difference|	t-Value	Sig.
Task-Technology Fit → Usefulness	.769***	.716***	.053	.881	n.s.
Task-Technology Fit → Ease of Use	.652***	.558***	.094	.950	n.s.
Task-Technology Fit → Convenience	**.690***	**.456***	**.234**	**2.445**	**
Task-Environment Fit → Task-Technology Fit	.528***	.454***	.074	.557	n.s.
Task-Environment Fit → Enjoyment	.589***	.453***	.136	1.101	n.s.
Task-Environment Fit → Comfort	**.650***	**.457***	**.193**	**1.651**	*
Usefulness → Attitude	.178	.081	.098	.641	n.s.
Ease of Use → Attitude	-.072	.015	.087	.629	n.s.
Convenience → Attitude	.142	.284***	.142	1.167	n.s.
Enjoyment → Attitude	.308**	.425***	.117	.747	n.s.
Comfort → Attitude	.302*	.238*	.064	.391	n.s.
Attitude → Intention to Inform	.659***	.642***	.017	.197	n.s.
Attitude → Intention to Purchase	**.294***	**.528***	**.234**	**1.924**	*
Intention to Inform → Intention to Purchase	**.647***	**.361***	**.286**	**2.245**	**

Note: Significance level for path coefficients (β): *significant at $p < .05$, **significant at $p < .01$, ***significant at $p < .001$; Significance level for group differences: n.s. = not significant, * significant at $p < .1$, ** significant at $p < .05$.

Table D-3: Multigroup analysis of IETV e-channel touchpoints path coefficients

First, a significant path difference (t = 2.445, p < .05) has been revealed for the effect of task-technology fit on convenience. As assumed, the effect of task-technology fit on convenience is stronger for consumers who used the app to shop online, indicating that a higher fit between task and technology leads to a higher degree of convenience perception. Second, it was found that the effect of task-environment fit on comfort is significantly different (t = 1.651, p < .1), with a stronger effect for the app (β = .650***) than for the browser (β = .457***). While the ANOVA analysis revealed that there is no significant difference between the evaluation of task-environment fit across e-channel touchpoints, comfort was evaluated more positively by users who shopped via the app. Therefore, it is to assume that the app not only adjusts to the characteristics of the IETV device but also better fits the environmental atmosphere of the living room, i.e., consumers honor a comfortable e-channel touchpoint that is adequate to their "lean back" mood. Moreover, this result is indicating that there is an interaction across the atmospherics of the e-channel touchpoint and the atmospherics of the physical environment.

Furthermore, a significant difference across e-channel touchpoints was found for the effect of attitude on intention to purchase (t = 1.924, p < .1) as well as that of intention to inform on intention to purchase (t = 2.245, p < .05). For the effect of attitude on intention to purchase, the path coefficient of the browser group (β = .528***) is almost twice as high compared to the effect of the app users (β = .294***) and surprisingly contrary to the hypothesis that the effects of app users should be stronger than the effects of browser users. This might be due to the novelty of the app, which is a completely new way to shop online, while the regular online store displayed on the IETV browser does not substantially differ from the online stores users might have used via a standard computer or laptop. Interestingly, the path relationship works opposite to the hypothesized direction for intention to inform on intention to purchase across browser users (β = .361***) and app users (β = .647***). The effect of consumers who used the app to search for product-related information on the intention to purchase via the IETV

device is much stronger than the comparable effect of browser users. Therefore, in the long run, the advantageousness of providing an IETV shopping app might increase for an online retailer because information searchers are more likely to turn to purchasers when using the app.

6.   Conclusions and Implications

This research investigates what determines consumers' attitude toward using a specific technology to shop online in the atmosphere of the living room. The findings from a quasi-experimental field setting in a real living room environment suggest that shopper motivations are determined by interactions between task-technology fit and task-environment fit. While task-technology fit is a predictor of utilitarian motivations, task-environment fit affects hedonic motivations that impact a user's attitude toward a technology used to shop online. Marketing research and marketing practice will benefit from this knowledge, when considering that online shopping in its entirety is a threefold interaction of the task a consumer attempts to accomplish, the technology that is available and the situational aspects of the physical environment.

By employing an Internet-enabled TV as a stimulus for an online shopping task, the acceptance of a new technology that might extend e-commerce and m-commerce to "IETV-commerce" was investigated. The findings show that hedonic motivations are the strongest predictors of the attitude toward IETV shopping; this discovery might also be valid for the use of mobile devices in the living room environment. All in all, the task-environment relationship suggests that especially the "lean back" atmosphere of the living room, in contrast to the work-related "lean forward" mood of consumers when using a computer or laptop at a desk for online shopping, might stimulate consumers' intentions to shop online and

might affect their online shopping behavior. Certainly, more research in the direction of environment-device choice is needed.

Moreover, this research contributes to the understanding of online shopping behavior by considering that the acceptance and evaluation of a technology might be moderated by available e-channel touchpoints. A comparison of an IETV shopping app with access to the regular online store via an IETV browser revealed that consumers evaluate the IETV shopping experience more positively when shopping with the app. ANOVA results show that app users found online shopping via IETV significantly more useful, easy, enjoyable, and convenient and had a more positive attitude toward using an IETV for online shopping. An examination of the relationships between constructs across e-channel touchpoints through a multigroup comparison illustrated that the convenience of IETV shopping is more strongly influenced by the task-environment fit when using the app. Hence, a conclusion of this research is that the app fits better in the environment of the living room and therefore makes IETV shopping more convenient. With regard to the growing share of IETV devices in consumers' living rooms, online retailers should consider the development of IETV shopping apps to deliver a beneficial and pleasant way to shop online. However, conventional web stores could be optimized for IETV shopping, as this is the case for mobile optimized websites, e.g., through responsive design. To overcome the usability limitations, it might also be an option to develop an own shopping device, such as the Amazon Fire TV which provides a convenient voice recognition function to search, purchase and consume digital contents.

This work has some limitations that should be addressed in future research. This research was limited to a specific technology and to a typical living room. Future research might investigate other devices, such as smartphones or tablets, in the context of "couch-commerce" and should account for varying living room atmospherics, e.g., furniture, the position of the IETV device, etc. With regard to the usage scenario, it might be of particular interest to consider the second-

screen utilization of devices. For example, consumers can use a tablet to shop online while watching TV, or they may combine two devices in the purchase process (e.g., watching a product video on an IETV and reading customer reviews on the tablet screen). With regard to the environment, situational variables other than the task-environment fit could play a critical role, such as the social context when other people are in the living room. In addition to motivations, barriers to using a technology for online shopping should be investigated, such as privacy concerns. Last, it might be of interest to identify and describe user clusters. This process would help to answer the question of whether couch shoppers differ from desktop shoppers or mobile shoppers in terms of age, gender and/or experience.

E. Synergies and Complementarity in Multichannel E-Commerce[8]

1. Introduction

In multichannel retailing the management of the overall portfolio of channels, rather than managing individual channels, is seen as the key to multichannel success (Agatz, Fleischmann and van Nunen 2008; Neslin et al. 2006). Accordingly, when online retailers operate more than one e-channel, they have to manage individual e-channel touchpoints (such as an e-tailing site and a mobile shopping app), but they also have to manage the interaction, i.e., the degree of synergies and complementarity across these channels. Channel synergies entail the coordination of retail channels to provide a seamless customer experience, for example by matching information, services or prices across channels (Pentina, Pelton and Hasty 2009; Schramm-Klein and Morschett 2006; Schramm-Klein et al. 2011). The complementarity hypothesis is based on the idea that the whole of a multichannel system is greater than the sum of its individual channels and suggesting that adding a new retail channel generates incremental sales by attracting new customers and increasing the spending of existing customers (Avery et al. 2009). Though many retailers already provide diverse e-channel touchpoints, there is no research that investigated the role of synergies and complementarity across e-channels as well as their effects on consumers' intention to use a retailer's multichannel e-commerce system.

Because more and more online shoppers switch across e-channels along the customer journey, the effects of retailers' online retailing activities on consumers' perceptual and behavioral responses should be examined in a multichannel retailing context (Kwon and Lennon 2009). Therefore, an extension of an individual e-channel perspective to a multichannel setting

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[8] A modified version of this essay is published in: Wagner, Gerhard, Hanna Schramm-Klein and Sascha Steinmann (2013), "Effects of cross-channel synergies and complementarity in a multichannel e-commerce system – an investigation of the interrelation of e-commerce, m-commerce and IETV-commerce," The International Review of Retail, Distribution and Consumer Research, 23 (5), 571–581.

would contribute to the marketing literature by filling a gap and advance theoretical understanding (Noble, Griffith and Weinberger 2005). The topic is of certain relevance, because the role of synergy and complementarity in multichannel e-commerce systems may differ from traditional multichannel retail systems (e.g., retail store and catalog). Retailers need to understand consumers' experience delivered by multichannel e-commerce environments to design and position their various e-channel touchpoints as an integrated, value-rich package (Mathwick, Malhotra and Rigdon 2001).

The objective of this study is to investigate the role of synergies and complementarity in a holistic multichannel e-commerce system (in this case based on traditional e-commerce, m-commerce and IETV-commerce). For this purpose the following research questions are addressed:

- How do synergies and complementarity across e-channels influence consumers' perception and usage intention of a retailer's multichannel e-commerce system?

- Is it from a consumer's perspective more relevant for a retailer to create synergies or to provide complementarities across e-channels?

The remainder of this essay is organized as follows: In the next section previous knowledge from the field of multichannel retailing is extended to the multichannel e-commerce context. Then, a research model is proposed and hypotheses are derived from prior research and theoretical assumptions. Thereafter, the methodology and data set are described. Finally, empirical results are discussed, findings are concluded and implications offered.

2.   Conceptual Framework and Research Model

Given that end devices are heterogeneous with regard to characteristics such as screen size or capabilities (e.g., barcode scanner functionality of mobile devices), but to a certain degree homogeneous (e.g., search and purchase functions are available for all e-channels), retailers

should be able to create synergies as well as complementarity across e-channels. In this study, three categories of e-channels are distinguished: the traditional e-channel, the mobile e-channel and the IETV e-channel.

While the role of synergies and complementarity in traditional multichannel environments (e.g., retail store and catalog) has received wide attention (e.g., Avery et al. 2009; Kollmann, Kuckertz and Kayser 2012; Montoya-Weiss, Voss and Grewal 2003), the findings and implications are only to some extent transferable to multichannel e-commerce. For example, one might assume that channel conflicts through cannibalization of sales across e-channels should not occur to the same degree as across traditional retail channels. While traditional retail channels (e.g., retail store and online shop) usually differ in shopping location, sales teams or availability of goods and thereby cause potential conflicts, e-channels share most resources, such as order processing, assortment of goods or logistics. However, individual e-channels and e-channel touchpoints are also different in some aspects, such as functionality or service features.

By using a retailer's multichannel e-commerce system, customers are able to visit an online store with different devices, via different touchpoints, at different places and in different situations. Because of these differences it is likely that consumers' needs and requirements vary across e-channels, in the same way as across traditional retail channels (Noble, Griffith and Weinberger 2005). The existence of multiple e-channels entails that online information search and actual online purchase do not necessarily have to be conducted using the same e-channel for both tasks (Kollmann, Kuckertz and Kayser 2012). Balasubramanian, Raghunathan and Mahajan (2005) suggest that consumers use different channels within a purchase process, because their objectives differ by stages. However, according to diffusion theory, the choice to use a new technology for searching or purchasing online is influenced by characteristics of the innovative technology (Rogers 1995). Consumer acceptance of a

technology and the intention to use an online store up until the transactional stage of purchasing was investigated by many authors (e.g., Ha and Stoel 2008; Monsuwé, Dellaert and de Ruyter 2004) using a framework based on Davis' (1989) Technology Acceptance Model (TAM). While TAM has received wide attention in predicting usage of a specific technology, it does not incorporate a broader set of alternatives that might limit or increase the intention to use one technology over the others or to use alternative devices in combination (Lee, Kozar and Larsen 2003). To understand why consumers choose an e-channel for search and another one for purchase and when they switch online shopping channels is important to investigate in order to maximize synergies in a multichannel e-commerce system (Yu, Niehm and Russell 2011).

In a multichannel context, each single e-channel is part of a multichannel e-commerce system. Thus, e-channels need to correspond and fit to form a holistic system. Fit as perceived by consumers can be achieved when retailers build synergies across channels and facilitate complementary use. Cross-channel synergies are important in relational exchange contexts in which customers choose from different channel formats that belong to the same firm (Montoya-Weiss, Voss and Grewal 2003). In the cross-channel context synergies comprise the possibility to switch across channels. Furthermore, the synergy concept is consistent with the integration function, which combines multiple stimuli to produce an overall response (Carlson and White 2008). For example, the findings of Schramm-Klein et al. (2011) underline the relevance of cross-channel integration, i.e., the availability of information, services or assortment in all channels for creating channel synergies.

Whereas synergies derive mainly from similarities and commonalities across channels, complementarity is a result from their heterogeneity (Avery et al. 2009). Based on considerations deduced from resource-based theory, resources can be combined and integrated into unique functionalities that enable distinctive capabilities for each e-channel

(Zhu 2004). Consumer's choice of a shopping channel depends on its capability to facilitate shopping goals, either as a single channel or in addition to existing channel alternatives (Dholakia et al. 2010). A new channel complements existing channels if it provides additional benefits (e.g., functionalities or services) for existing customers or if it serves customers who were previously not served (Moriarty and Moran 1990). This means that channel capabilities are complementary if they are different in a way that can be combined to create greater value (Mitsuhashi and Greve 2009). When retailers operate sales channel alternatives, complementary or competitive channel capabilities derived from each channel have to be managed and knowledge is necessary which channel capabilities drive customer's channel choice or usage (Noble, Griffith and Weinberger 2005). Referring to information integration theory that describes how a person integrates information from diverse sources to make an overall judgment (Anderson 1971), one might suggest that the use of multiple e-channels leads to better valuation and enhanced satisfaction in the purchase process and thereby to an increased usage intention of a multichannel e-commerce system. In the next section, these considerations are explicated and specified.

The research model, as presented in Figure E-1 is based on diffusion, information integration and resource-based theory. First, a brief definition of each construct is offered, then assumptions are derived and research hypotheses postulated. Complementarity of e-channels derives from differences in the capabilities and handling of individual e-channels, that thereby create unique value (Berry et al. 2010). When e-channel synergies exist, customers can obtain similar services through various interchangeable e-channels. According to Zeithaml (1988), perceived value is defined as a consumer's overall assessment of the utility of a multichannel e-commerce system, based on perceptions what is received and what is given. In a multichannel service setting, overall satisfaction is a result of transaction-specific satisfaction with the performance of the multichannel e-commerce system (van Birgelen, de Jong and de

Ruyter 2006). In the context of this study, usage intention includes the intention to use a retailer's diverse e-channels to gain information, to search or to purchase.
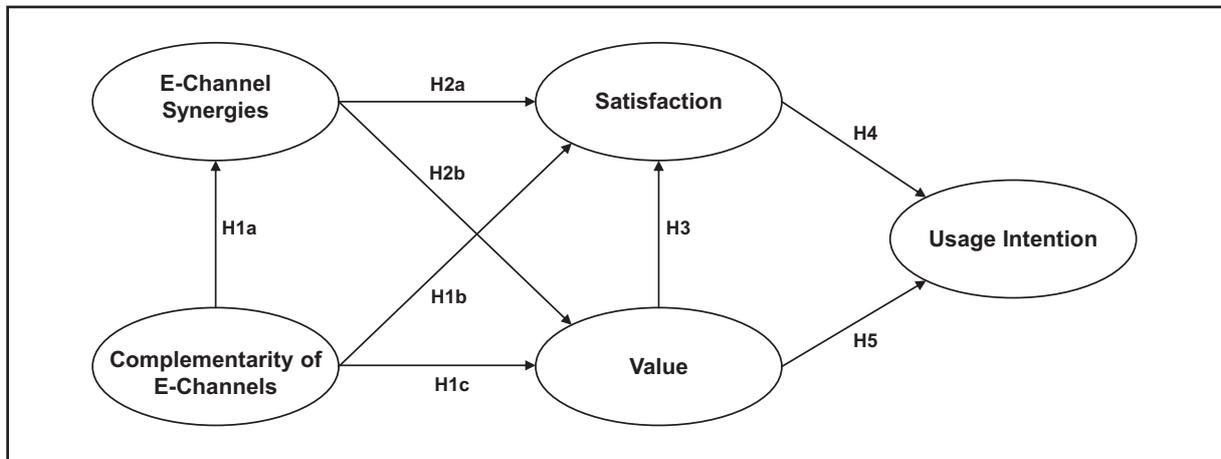

Figure E-1: Research model for interactions in multichannel e-commerce

3.   Hypotheses

Complementarity represents an enhancement of value and arises when an e-channel—because of its dissimilarity to other e-channels—produces greater returns in the presence of another e-channel than by itself (Zhu 2004). Therefore the sole evaluation of separate e-channels would fail to consider that consumers tend to build an overall judgment by combining discrete evaluations of the performance of a holistic multichannel e-commerce system (Johnson, Anderson and Fornell 1995). For example, consumers may gather information and services from multiple e-channels to be used in a complementary way with synergistic effects (Strebel, Erdem and Swait 2004). By using a combination of e-channels, retailers can better satisfy customers' needs by exploiting the benefits and overcoming the deficiencies of each e-channel (Zhang et al. 2010). These considerations lead to the following hypotheses:

H 1:   The complementarity of e-channels has a positive effect on ...

> *a. ... synergies across e-channels.*

> *b. ... customer's satisfaction with a retailer's multichannel e-commerce system.*

> *c. ... perceived value of a retailer's multichannel e-commerce system.*

van Birgelen, de Jong and de Ruyter (2006, p. 368) describe cross-channel synergy as the "goodness of fit between multiple service channels," i.e., customer's perception that the performance of one channel is similar to that of another. Based on this understanding, the integration of e-channels (e.g., integration of information, services, payment options) as well as the possibility to be able to switch across e-channels (e.g., informing and purchasing in different e-channels) are underlying dimensions of synergies in the multichannel e-commerce context. By the potential existence of synergies, the added value of all e-channels in a multichannel e-commerce system exceeds the sum of their individual values (Naik and Raman 2003). For a retail customer, cumulative satisfaction typically reflects a combination of multiple channels, i.e., the entirety of his or her experiences with individual channels (Berry et al. 2010). Thus, it is proposed that:

H 2:   *Synergies across e-channels have a positive effect on …*

   a. *… customer's satisfaction with a retailer's multichannel e-commerce system.*

   b. *… perceived value of a retailer's multichannel e-commerce system.*

Rust and Oliver (1994) argue that it is likely that value is a relevant antecedent for satisfaction with a service. In the same manner, McDougall and Levesque (2000) have found that perceived value is one of the most important drivers of customer satisfaction with service quality and conclude that consumer's value perception should be incorporated into customer satisfaction models. With a growing number of channel options, each e-channel of a multichannel e-commerce system should create specific value and thereby contribute to overall satisfaction (Montoya-Weiss, Voss and Grewal 2003). Hence, it is hypothesized that:

H 3:   *The perceived value of the multichannel e-commerce system positively affects satisfaction with the multichannel e-commerce system.*

Customer satisfaction is widely recognized as a key driver in the formation of consumers' purchase intentions (Taylor and Baker 1994). Findings from Finn (2005) reveal that

customer's behavioral intention toward website revisits is determined by satisfaction with the website. Van Birgelen, de Jong and de Ruyter (2006) show that interactions of customer satisfaction with the performance of multiple service channels mainly determine behavioral intentions. Likewise, satisfaction with one e-channel should enhance a customer's intention to use the same or an alternative e-channel of a retailer's multichannel e-commerce system for online shopping related activities (Balasubramanian, Raghunathan and Mahajan 2005). Thus, the following hypothesis is proposed:

H 4: *Satisfaction with the multichannel e-commerce system has a positive effect on the intention to use this multichannel e-commerce system for online shopping.*

Several studies have indicated an effect of value perceptions on the intention to use a retail channel for searching or purchasing (Yu, Niehm and Russell 2011). For example, Cronin, Brady and Hult (2000) suggest that perceived value is an adequate predictor of (re-)purchase intentions. Lin et al. (2012) investigated the effects of perceived value on intentional behavior in an experiential computing context and conclude that value should be employed to study consumers' continuance intention in this field. If consumers value the services and features provided from multiple e-channels in a retailer's multichannel e-commerce system this should positively affect the intention to use the multiple e-channels of a retailer. Therefore, it is proposed that:

H 5: *Perceived value of a multichannel e-commerce system has a positive effect on the intention to use this multichannel e-commerce system for online shopping.*

4. Methodology

Research Design and Procedure

To test the effects of synergy and complementarity in a multichannel e-commerce system, an online survey using a standardized questionnaire was devised to target Internet shoppers.

Internet shoppers were chosen as target audience, because respondents had to reply to questions referring to the evaluation of online shopping opportunities. In the survey, respondents were asked to evaluate the relevance of synergies and complementarity across three given e-channels as well as satisfaction, perceived value and usage intention of the multichannel e-commerce system. A personal computer and a laptop were given as examples for the traditional e-channel, a smartphone and a tablet PC as typical devices of the mobile e-channel and an Internet-enabled TV as an example for an IETV e-channel device (see Figure E-2).

Traditional E-Channel   Mobile E-Channel   IETV E-Channel
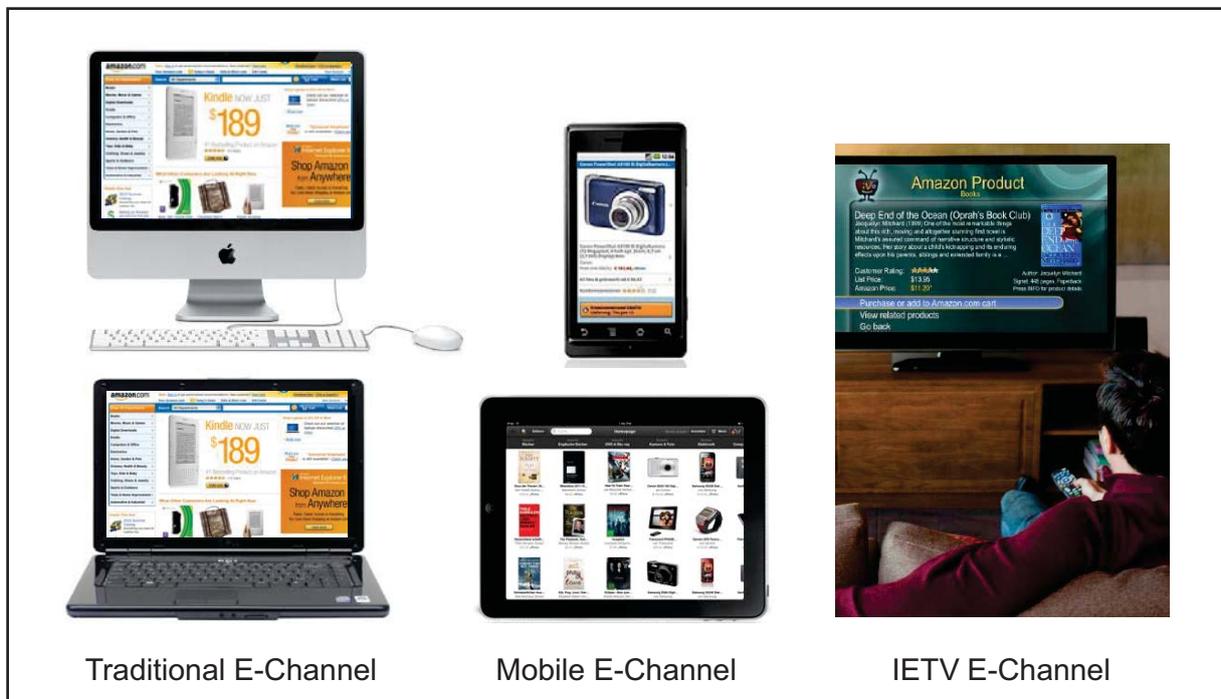
Figure E-2: Provided examples of e-channels and related e-channel touchpoints
Source: Screenshots of Amazon.de and Amazon shopping apps; Cisco IBSG (2009).

For each e-channel, a detailed introduction (description of related devices, available e-channel touchpoints and capabilities) was given. Collection of data was conducted over a 30-day period. Respondents were invited via e-mail, social networks (e.g., facebook) and a link on the university website to participate in the online study.

Sample

A total of $N = 1{,}015$ respondents followed the invitation to take part in the study. After elimination of incomplete and erroneous data records, $N = 904$ cases remained for further data analysis. In the sample, women had a representation of 51.5 % and the average age was $M = 26.4$ ($SD = 7.6$) years, which is adequate for a study in e-commerce, because consumers aged 24 to 35 do about a quarter of their purchases online (Economist 2012). Experience with regard to actual use of e-channels was differing across proposed e-channel formats. While 99.4 % (97.7 %) used the traditional e-channel for informing (purchasing) and 72.5 % (45.9 %) the mobile e-channel, so far only 11.9 % (5.5 %) made use of the IETV e-channel.

Measures

Questionnaire items were taken from previous studies and adapted to fit the context of consumer behavior in a multichannel e-commerce environment (see Table E-1). A pretest with 20 graduate students was conducted to assess the clarity of the items and scales. Based on this pretest, the questionnaire was revised. Before conceptualizing the items to measure the latent constructs, it is important to consider whether the indicators can be characterized as reflective or formative (Bollen and Lennox 1991). To conceptualize synergies, complementarity and intention to use, a formative measurement was chosen and for satisfaction and perceived value a reflective approach. To measure the relevance of e-channel synergies, nine items from Schramm-Klein et al. (2011) were adapted. Four items were applied to assess the advantageous of the complementarity of e-channels (Berné, Múgica and Yagüe 2001). To measure consumers' perceived value four established items were employed (Pura 2005; Pihlström and Brush 2008) ($\alpha = .88$). Satisfaction with the multichannel e-commerce system was measured with three items (Mägi 2003) ($\alpha = .87$). Following Bart et al. (2005), intention to use a multichannel e-commerce system for future online shopping was

measured using five items. The items were assessed using 5-point Likert scales. Questionnaire

items and corresponding scales are listed in Table E-1.

Construct	Item	Source
A. E-Channel Synergies		
Synergies	All e-channels should provide the same product information.	Adapted from Schramm-Klein et al. (2011)
	All e-channels should offer the same services.	
	Information concerning the status (e.g., availability, delivery) should be available via all e-channels.	
	It should be possible to conclude the buying process via all e-channels.	
	All e-channels should offer the same payment options.	
	It should be possible to search via one e-channel (e.g., mobile) and buy later via another e-channel (e.g., traditional).	
	All products which are reserved (e.g., wish list, shopping basket) via one e-channel (e.g., IETV) should be available via another e-channel (e.g., traditional) afterwards.	
	You should be able to orient yourself quickly in all e-channels.	
	An e-channel (e.g., traditional) should be able to be replaced completely by another e-channel (e.g., mobile).	
B. Complementarity of E-Channels		
Complementarity	I rate e-channels having specific/individual functions (e.g., scan functions) as…	Adapted from Berné, Múgica, and Yagüe (2001)
	I rate the availability of e-channels in different situations (e.g., on the way, on the couch) as…	
	I rate the possibility to use e-channels in a variety of ways (e.g., handling via remote control [IETV] or touch screen [mobile]) as…	
	I rate the possibility to use multiple e-channels at once (e.g., simultaneous announcement of a product video via the IETV e-channel and retrieval of additional information via the mobile e-channel) as…	
C. Perceived Value of the Multichannel E-Commerce System		
Perceived Value	Thanks to the possibility of reaching the online offer via different e-channels, online shopping is very easy.	Adapted from Pura (2005); Pihlström and Brush (2008)
	Thanks to the possibility of reaching the online offer via different e-channels, I can use my time more efficiently.	
	I appreciate it to attain the online offer via different e-channels.	
	Thanks to the possibility to attain the online offer via different e-channels, shopping becomes very comfortable.	
D. Satisfaction with the Multichannel E-Commerce System		
Satisfaction	How well does the presented offer of multiple e-channels match your expectations?	Adapted from Mägi (2003)
	How satisfied are you with the presented offer of multiple e-channels?	
	Imagine a perfect system of e-channels. How close to this ideal is the presented system of e-channels?	
E. Intention to Use the Multichannel E-Commerce System		
Usage Intention	I will use multiple e-channels for useful shopping recommendations.	Adapted from Bart et al. (2005)
	I will use multiple e-channels for shopping.	
	I will recommend shopping via multiple e-channels to friends.	
	The probability of future shopping in multiple e-channels is very high.	
	The probability of using an e-channel for shopping recommendations and using another e-channel for shopping in future is very high.	

Note: Scales: strongly disagree (1) to strongly agree (5) for A, C, E; very disadvantageous (1) to very advantageous (5) for B; not at all (1) to completely (5) to for D.
Table E-1: Constructs and corresponding items

All standardized factor loadings were above the minimum threshold of acceptability (> .4).

All reflective measures exceeded the recommended levels concerning composite reliability

(CR > .6) and average variance extracted (AVE > .6). With CR at .87 or above and average

variance extracted at .72 or above, the values of CR and AVE are considered satisfactory.

Discriminant validity of variables was assessed based on the Fornell-Larcker criterion

(Fornell and Larcker 1981). Since AVE is greater than the squared correlation coefficient across factors, validity was found for all variables assessed. For formative constructs, the presence of multicollinearity was checked by the variation inflation factor (VIF < 2). The Stone-Geisser criterion, which assesses the predictive quality of the model (Q^2 value), indicates an adequate model specification (Chin 1998).

5. Results and Discussion

Table E-2 contains the means, standard deviations and the correlations among the constructs. The means indicate that respondents especially find synergies across e-channels relevant ($M = 4.35$, $SD = .63$) but also rate the complementary across e-channels as advantageous ($M = 4.02$, $SD = .66$). Correlations suggest positive relationships ($r = .250$ to $.617$) across constructs which are significantly associated ($p < .01$).

Construct	Mean	SD	A	B	C	D	E
A. Synergies	4.35	.63	1				
B. Complementarity	4.02	.66	.471	1			
C. Perceived Value	3.86	.81	.399	.559	1		
D. Satisfaction	3.69	.75	.326	.401	.607	1	
E. Usage Intention	3.18	1.09	.250	.488	.617	.563	1

Note: Scales: strongly disagree (1) to strongly agree (5) for A, C, E; very disadvantageous (1) to very advantageous (5) for B; not at all (1) to completely (5) to for D; Correlations are significant at the level of $p < .01$.

Table E-2: Descriptive statistics and correlations

To test the hypotheses Partial Least Squares Structural Equations Modeling (PLS-SEM) was conducted, using smartPLS 2.0 (Ringle, Wende and Will 2005). PLS is appropriate for research, which is still at an early stage and for handling both reflective and formative constructs (Chin 1998). Statistical significance was verified based on a bootstrap re-sampling procedure with 5,000 samples. The results show that all postulated effects are positive and significant, which indicates that e-channel synergy and complementarity of e-channels are relevant antecedents of consumer behavior in a multichannel e-commerce system (see Figure E-3).
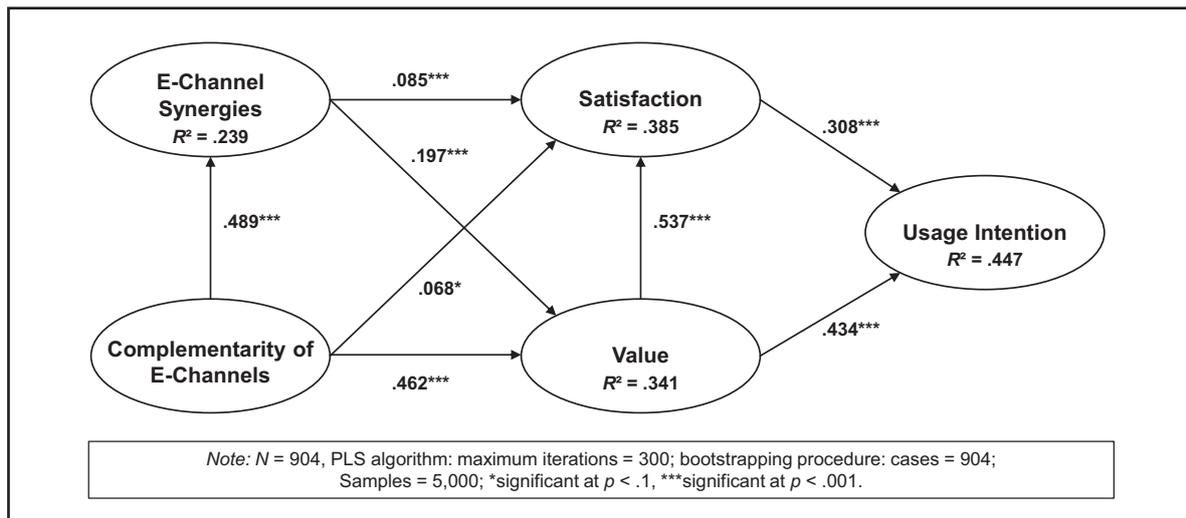
Figure E-3: Results of PLS-SEM: Effects of synergies and complementarity

In particular, the results suggest that complementarity across e-channels has a substantial impact (β = .489***) on evaluation of synergies in a multichannel e-commerce system, supporting hypothesis 1. One may conclude that individual capabilities of e-channels are a precondition for customers to use e-channels synergistically. Furthermore, complementarity of e-channels has a rather weak but still significant effect on satisfaction (β = .068*) but a strong direct impact on perceived value (β = .462***). This is in line with the assumption, that through complementarity across e-channels the perceived value of the multichannel e-commerce system exceeds the value of the individual e-channels. Quite similar is the impact of perceived e-channel synergies on satisfaction (β = .085***) as well as on perceived value (β = .197***). These results suggest that synergies across e-channels are of relevance, but complementarity across e-channels is even more important.

To sum up, consumers value additional services and varying capabilities of alternative e-channels more than similarities and commonalities across e-channels. As expected, perceived value is a relevant antecedent (β = .537***) of customer satisfaction with a retailer's multichannel e-commerce system. In other words, an online retailer can enhance customer satisfaction, by creating a valuable multichannel e-commerce system. And both,

satisfaction (β = .308***) as well as perceived value (β = .434***) are appropriate predictors of the intention to use a retailer's multichannel e-commerce system for online shopping.

Since in this study both predictor and criterion variables were obtained from the same person and in the same measurement context, Common Method Variance (CMV) might bias the findings. To address the CMV issue, the recommendations suggested by Podsakoff et al. (2003) were followed. First, procedural remedies related to questionnaire and item design (e.g., to eliminate item ambiguity or to avoid social desirability) were considered. To reduce method biases, respondents were allowed to answer anonymously. Furthermore, participants were told that there are no right or wrong answers and that they should answer all questions honestly. To control the results for CMV, the procedure recommended by Podsakoff et al. (2003) was followed and Harman's single-factor test (for one single method factor), using factor analysis across all variables, was conducted. Only 36 % of the variance can be accounted for by one general factor.

However, as the validity of Harman's single-factor test has been criticized (e.g., Malhotra, Kim and Patil 2006), in addition, as proposed by Lindell and Whitney (2001), a marker variable was included in the PLS model that is conceptually independent from the latent variables in this study. As marker variable consumer's antecedent state (his or her mood, time pressure or disposition toward shopping in general) was used. This model, in which the marker variable was included as a latent variable that directly affects every other variable in the model, shows a consistent pattern of results, with only marginal changes in path coefficients and no changes in significance levels found. This suggests that the analysis is not subject to an inherent common method variance in the responses to the survey.

6.   Conclusions and Implications

When customers use diverse Internet-enabled devices for online shopping the interaction of different e-channels and e-channel touchpoints is of relevance to build a well integrated multichannel e-commerce system. Positive effects of synergy and complementarity in a multichannel e-commerce system were postulated and empirically validated. The results of the empirical study suggest that synergies and complementarity are relevant antecedents of consumer behavior, particularly the intention to use a retailer's multichannel e-commerce system. Therefore, retailers have to integrate and coordinate individual e-channels by providing adequate e-channel touchpoints to create synergies and better fulfill customer needs. This is in line with Montoya-Weiss, Voss and Grewal (2003) who stated that deriving synergies across channels and attracting customers to the channel that best satisfies their needs on any given occasion will gain more relevance in multichannel retailing. Moreover, coordination of e-channel touchpoints in a multichannel e-commerce system represents a strategy that can be a source of competitive advantage for online retailers by providing unique interchannel synergies (Pentina, Pelton and Hasty 2009).

But the findings underline in particular the role of complementarity across e-channels, in terms of differences across individual e-channels and e-channel touchpoints. In particular, the results suggest that an additional e-channel creates enhanced value if it offers extra benefit for the consumer. E-channel complementarities encourage consumers to visit multiple e-channel touchpoints of a retailer and hereby increase the engagement with a retailer brand (Gijsbrechts, Campo and Nisol 2008). Retailers can use this knowledge to create a "frictionless" e-channel environment and underline the individual benefits of single e-channels. A multichannel e-commerce system that provides synergies and complementarity would offer manifold shopping experiences, and deliver not only more value, but also different kinds of value (Mathwick, Malhotra and Rigdon 2001). This essay contributes to

academic research and theoretical understanding by highlighting the effects of synergies and complementarity in the innovative context of a multichannel e-commerce system. The findings help to understand consumer behavior across e-channels and provides first insights why consumers utilize multiple e-channels for online shopping.

As all empirical research, this study has some limitations that should be addressed with future research. Prior literature suggests that consumers may use different channels during their lifecycle (Neslin and Shankar 2009). Therefore further research should incorporate the impact of age as well as other demographic variables on e-channel choice and the behavior in multichannel e-commerce environments. Furthermore, customers' contact sequences along the customer journey according to their individual e-channel behavior could be explored (Steinmann and Silberer 2010). Another relevant topic will be how synergies and complementarity can be achieved and optimally adjusted. Swoboda, Berg and Schramm-Klein (2013) provide evidence of the existence of reciprocal relationships between a corporate level and a retail store level and found different effects on store loyalty. It should be accounted for this kind of reciprocal relationships in future studies with regard to the e-channels in a multichannel e-commerce system. Moreover, the results indicate that synergies and complementarity have positive effects, but not to which degree. Last, the integration and coordination of e-channels induces effort and costs, which could be included in future studies.

F. General Conclusion

1.   Core Results and Conclusions

Marketing practice and academic research have widely recognized that the Internet has become a significant part of the retail landscape and altered the way how consumers search for information and conduct purchases. This dissertation incorporates that through the increasing multiplicity of Internet-enabled devices, which consumers now use for online shopping activities, the online retailing environment itself changes fundamentally. The four essays of this dissertation show that consumers utilize diverse connected devices for online purchases and switch across e-channels (device categories) during their online customer journeys. Thus, retailers are challenged to accompany their customers on each and every channel by providing adequate e-channel touchpoints (shopping formats).

However, as calls for research and a broad review on online retailing (see essay 1) have revealed, there remain considerable gaps in the literature on online consumer behavior that failed to incorporate the impact of a multichannel e-commerce environment. Hence, the general research objective of this dissertation was to contribute to marketing research by considering how the increasing appearance of new e-channels and e-channel touchpoints alter the online retailing environment and online consumer behavior.

The general objective was subdivided into four specific research objectives, which were addressed in the four essays of this dissertation. In order to specifically respond to the formulated research objectives, this section will summarize the key results of each essay and discuss the main conclusions of the findings. This provides also a basis for deriving the implications of this research, for identifying its limitations and for suggesting future research directions.

Essay 1: A Framework for Multichannel E-Commerce Analysis

The first research objective was to develop a framework that illustrates and contributes to understanding of the multichannel e-commerce environment and to explore what devices constitute relevant e-channels from a consumer's perspective. The findings derived from two empirical studies support the postulated expansion and fragmentation of online retailing which emphasizes the need for a more differentiated consideration of e-commerce. In particular, the findings show that German consumers, taken as a whole, currently utilize 12 different types of devices for online shopping. Furthermore, the results of the MDS analysis reveal that the 12 types of devices constitute four distinct e-channel categories. Hereby, not only the differentiation between e-commerce and m-commerce is validated, but also, two new categories of e-channels (IETV-commerce and complementary commerce (c-commerce)) can be added to today's online retailing landscape.

Moreover, the results illustrate that utilization of a specific e-channel along the online customer journey is dependent on the technological characteristics of the device, but also influenced by the situational context (e.g., time or place) of utilization. The findings of the second study complement this knowledge by demonstrating that the overall evaluation of an e-channel is affected by the utilized e-channel touchpoint and significantly different across diverse e-channel touchpoints. Thereby, the multichannel e-commerce framework underlines that not only the utilized e-channels (devices) but also the employed e-channel touchpoints (formats) have to be considered to capture online consumer behavior holistically. Summing up, consumers utilize and differentiate between alternative e-channels and e-channel touchpoints as proposed in the multichannel e-commerce framework. This knowledge is important for academic research as well as for marketing practice, because the insights of this first essay indicate that online retailing stimuli generate different outcomes depending on the employed e-channel or e-channel touchpoint.

Essay 2: Comparative Analysis of E-Channels

According to the second research objective of this dissertation, differences across individual e-channels were investigated with regard to the perception and evaluation of online shopping with devices of two distinct e-channels. The findings provide evidence for significant differences in the evaluation and usage intention of the traditional e-channel (a desktop computer) and the mobile e-channel (a mobile device). In particular, the online shopping experience with the computer is evaluated more positively than the mobile shopping experience. Moreover, tests for differences with regard to consumer characteristics reveal that technological experience is a significant covariate of the evaluation of e-channels and that female consumers evaluate online shopping with both e-channels more enjoyable as male shoppers.

Results of SEM analyses suggest that the derived research model, an extension of TAM, is suitable to investigate consumer behavior of e-channel categories individually as well as consolidated to a retailer's multichannel e-commerce system. A multigroup analysis to examine differences of path relationships across e-channels reveals that some effects are quite similar, indicating that factors determining a consumer's shopping intention are concurrently valid for distinct e-channel categories. For example, in the case of both e-channel categories perceived enjoyment was found to be a relevant antecedent of the intention to use the device for online shopping, affecting the usage intention in equal measure when compared between devices. However, some path relationships between the constructs under review in this study vary between e-channels, for example, the link between perceived ease of use and usage intention, suggesting that consumers will behave differently across e-channels. All in all, the insights of this second essay underscore the need to differentiate between varying types of e-channels and e-channel touchpoints when analyzing overall online shopping behavior, as suggested in essay 1. These insights are essential for marketers' and researchers'

understanding of how the effects that emanate from the usage of a specific e-channel impact online consumer behavior and how to respond to the behavior of consumers in single e-channels.

Essay 3: Online Shopping via the Internet-enabled TV E-Channel

The third research objective was to understand the diffusion and acceptance of e-channels by investigating what motivates consumers to use the IETV e-channel, which has been revealed as a relevant new e-channel category by the findings of essay 1. By designing a quasi-experimental field setting and conducting the study in a real living room, it was possible to examine how shopper motivations are influenced by technological and environmental factors. Findings indicate that the attitude toward IETV shopping is primarily driven by hedonic shopping motivations. In particular, results suggest that IETV shopping is perceived as a comfortable and enjoyable way to shop in the "lean back" atmosphere of the living room, which underlines the potential of the IETV e-channel for online retailing. Furthermore, findings demonstrate that motivational factors are determined by the characteristics of the technology as well as by the environmental context. This suggests that a consumer's decision to shop online with a specific e-channel is influenced by the interaction of the task a consumer tries to accomplish, the technology that is available to accomplish the task and the situational context in which the task is accomplished.

Comparing the results of employed e-channel touchpoints reveals that a consumer's experience is perceived as more positive when shopping via an IETV app than when shopping by accessing an online store via IETV browser. Findings from a multigroup comparison suggest that the IETV app is technologically superior, but also shows a higher fit with the environment of the living room and therefore turns IETV shopping more convenient and comfortable. These findings confirm the results of the second study of essay 1, i.e., that the evaluation of an e-channel depends on the provided e-channel touchpoint, and expand our

understanding of e-channel choices by demonstrating the influence of the environmental context. This knowledge is of relevance, because it reveals that further devices might play a relevant role for online retailing because of their technological characteristics but also because of the place and atmosphere of their utilization.

Essay 4: Synergies and Complementarity in Multichannel E-Commerce

To address the fourth objective of this dissertation, the interrelationships across e-channels were investigated by considering the role of synergies and complementarity in a retailer's multichannel e-commerce system. While the focus of the first three essays was to examine individual e-channels and e-channel touchpoints as perceived by the consumer, the scope of the fourth essay was on the interactions across e-channels. Findings underline that e-channel synergies and complementarity of e-channels are both relevant antecedents of consumer behavior in a multichannel e-commerce system.

In particular, results reveal that synergies across e-channels are important, however complementarity across e-channels is even more relevant from the consumer's perspective. Hence, the findings confirm that the "complementarity hypothesis" which states that the whole value of a multichannel system is greater than the sum of its individual channels is also relevant for multichannel e-commerce. In summary, insights from this essay suggest that an online retailer can create a beneficial online shopping experience for customers by integrating e-channels and offer enhanced value by emphasizing individual capabilities of single e-channels. The knowledge derived from this essay is important, because it underlines that to deliver customer-centric online shopping benefits it is not only relevant to develop individual e-channel touchpoints, but e-channels have to be tied together through touchpoints in a complementary way to provide a holistic online shopping experience.

Concluding Remarks

By developing the multichannel e-commerce framework and investigating the effects of e-channels and e-channel touchpoints on online consumer behavior, this dissertation contributes to fill relevant gaps in the current literature. The results of the presented five empirical studies, included in the four essays of this dissertation, are based on consumers' perceptions and evaluations of different e-channels and e-channel touchpoints, and build on varying samples and multiple research methodologies. Findings advance the knowledge of academic research and marketing practice and extend the understanding in the fields of consumer behavior, multichannel retailing and e-commerce. Each essay provides specific answers for the understanding of consumer behavior across e-channels and e-channel touchpoints. Altogether, the essays contribute to understand the transformation from e-commerce to a multichannel e-commerce environment.

2.   Research and Theoretical Implications

This work offers a multichannel e-commerce approach and framework which extend the existing knowledge on online retailing by introducing and defining "e-channels" and "e-channel touchpoints," and demonstrating their influence on online shopping behavior. Academic research should employ the derived multichannel e-commerce framework to examine consumers' perceptions and evaluations of new types of e-channels individually or consolidated to a retailer's multichannel e-commerce system. As discussed, the findings of this dissertation demonstrate the importance of considering interrelationships across e-channels and e-channel touchpoints to capture the additional benefit, which exceeds the sum of individual benefits derived from single channels. Therefore, the multichannel e-commerce framework is also appropriate to incorporate cross-channel effects, such as synergies and complementarity.

Moreover, this dissertation extends the existing research on multichannel retailing by expanding the idea of "the online channel" to a multitude of e-channels and related touchpoints. This perspective of multichannel online retailing suggests that online pure players that provide a multitude of e-channel touchpoints for diverse e-channels (such as Amazon, Vente-Privee or Zalando) have to be regarded as multichannel e-commerce retailers.

However, findings underline especially the relevance of a more differentiated perspective for the definition and conceptualization of online retailing. Consumers perceive, evaluate and behave differently, depending on the utilized e-channel or e-channel touchpoint. The results indicate that online consumer behavior is moderated by employed e-channels and e-channel touchpoints as well as through consumer characteristics and the situational context (see Figure F-1) (Larivière et al. 2011).
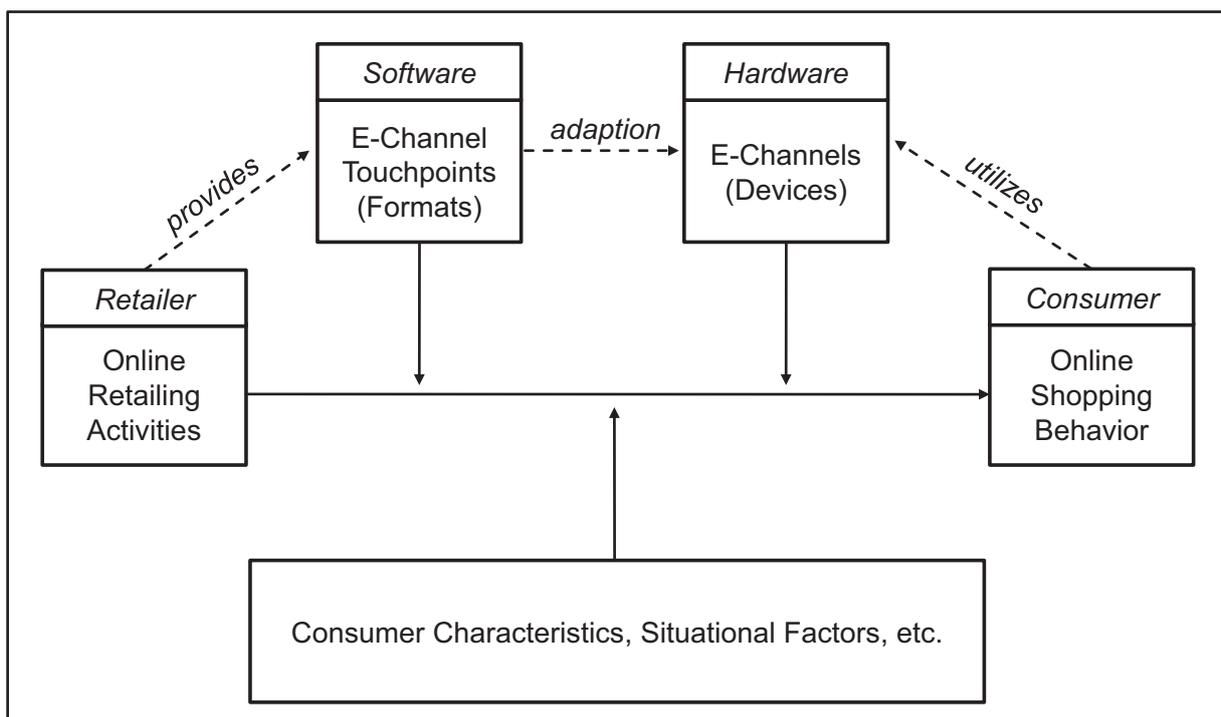
Figure F-1: Moderating effects of e-channels and e-channel touchpoints

Therefore, how a retailer's online retailing activities are perceived by consumers and how these affect online shopping behavior has to be considered in matters of consumer- and context-specific covariates, but also in consideration of the devices (hardware) and formats

(software) employed by the online shopper. The moderation effects are influenced by the specific e-channel touchpoints that an online retailer provides and how these touchpoints are adapted to the e-channels that consumers utilize for online shopping. Moreover, the adaption of the formats to the characteristics of the devices is relevant to deliver individual capabilities of touchpoints (i.e., complementarities), and for the integration of touchpoints (i.e., synergies).

In addition, this dissertation offers theoretical explanations with regard to consumer motivations to use different e-channels and e-channel touchpoints for online shopping and the external factors that determine these motivations. In particular, the results support the significance of a combination of technology-related and context-related situational factors for explaining the motivation to use an e-channel. This suggests that it is important to include the physical environment to explain consumer behavior in a digital world. By introducing and validating the influence of the task-environment-fit, this dissertation offers first insights how "the real world" environment determines consumers' e-channel choices. Moreover, results indicate that especially hedonic benefits affect psychographic variables (such as attitude or value) that have an impact on consumers' intentions to use an e-channel for online shopping. Another noteworthy finding and starting point for further theoretical considerations is that ease of use was not found to be a relevant predictor of the intention to use an e-channel, which is in line with some studies (e.g., Burton-Jones and Hubona 2006; Loiacono, Watson and Goodhue 2007; Pavlou 2003) but contrary to most empirical findings (e.g., Chiu et al. 2009; Choi, Kim and Kim 2010; Hong, Thong and Tam 2006; Mallat et al. 2009; Van der Heijden 2004).

With regard to the employed methodologies, structural equation modeling combined with a multigroup analysis is a suitable approach to examine online consumer behavior across individual e-channels or e-channel touchpoints as well as consolidated to a retailer's

multichannel e-commerce system. Furthermore, the categorization of e-channels on the basis of consumers' perceptions of Internet enabled devices through multidimensional scaling delivered valuable insights how consumers subdivide the online retailing landscape.

3.   Managerial Implications

This dissertation provides knowledge and implications for managers of online retailers, multichannel retailers and retailers who consider to initiate and take part in e-tailing. By illustrating how the online retailing environment and online consumer behavior have changed, guidance is offered to managers for making more informed decisions with respect to online retailing strategies. Marketers and retailers can benefit from this research by considering the following practical implications.

Understanding consumers' choice and usage of specific e-channels is necessary to determine how to configure and coordinate individual e-channels as part of a multichannel e-commerce strategy. This dissertation provides new insights and implications for managers in three main domains:

1. How to use a multichannel e-commerce perspective for gaining insights in e-channel and e-channel touchpoint choice,

2. how to strategically implement e-channel touchpoints, and

3. how to manage the interactions across e-channels.

As online retailing is expected to broaden, as a consequence of the increasing multiplicity of Internet-enabled devices, the multichannel e-commerce approach addresses superordinate e-channel characteristics. Thereby the multichannel e-commerce framework can help managers to understand how online shopping behavior is influenced by multiple devices and by diverse touchpoints. This knowledge is important for retailers to provide services adjusted

to consumers' expectations toward different categories of e-channels and for delivering suitable e-channel touchpoints for diverse utilization scenarios. The different e-channels also suggest the need for retailers to develop specific strategies for e-channel touchpoints. For example, retailers need to consider the development of shopping apps to deliver customer-centric, beneficial shopping experiences adapted to the characteristics of the e-channel and its utilization context.

Retailers who offer adequate shopping experiences for new and innovative e-channels would benefit from a first mover advantage. For example, currently, there are only few retailers who provide shopping apps for IETVs. Therefore, retailers that, first of all, establish a convenient and comfortable e-channel touchpoint according to the needs and preferences of their actual and potential customers, would gain a competitive advantage. Moreover, the insights into e-channel utilization indicate that individual consumers perceive and evaluate the same e-channel differently, for different tasks, at different times and in different places. Hence, to provide consumers with multiple e-channel touchpoints is likely to increase the possibility that shoppers are able to select an adequate e-channel to fulfill their needs in every situation. The overall evaluation of an e-channel depends on the development and adoption of the touchpoint to the characteristics of the device. For example, the results show that a mobile-optimized website and mobile app both exceed the evaluation of a regular (PC-optimized) website significantly. However, there is still much room for improvements in matters of usability and usefulness of e-channel touchpoints, as online shoppers expect enjoyable and convenient online shopping experiences. Therefore, the objective from a managerial perspective should be to create e-channel touchpoints that provide online shoppers with utilitarian and hedonic benefits.

Understanding how each e-channel provides benefit to consumers is just a first step to optimize a multichannel e-commerce system. The challenge for retailers is to configure and

coordinate the advantages of every e-channel through adequate e-channel touchpoints. Therefore, on the one hand retailers need to exploit advantages from every individual e-channel through adapted and customer-centric e-channel touchpoints, on the other hand e-channels have to be integrated and tied together to create a holistic multichannel e-commerce system that provides paths for a seamless online customer journey. The goal should be to create a unique customer experience on every e-channel touchpoint but a consistent brand experience across e-channels.

Retailers have to integrate and coordinate individual e-channels by providing adequate e-channel touchpoints that create synergies and better fulfill individual customer needs through specific capabilities. Since the ideal path to purchase is likely to vary across individuals or individuals may prefer different paths with regard to different utilization contexts, retailers should allow consumers to switch across e-channels and e-channel touchpoints. For this purpose, a retailer has to provide optimized e-channel touchpoints for all e-channels their customers utilize. Retailers can promote e-channel integration by providing consistent information and services across all e-channels, by allowing customers to integrate the utilization of e-channels in their online customer journeys, such as starting a purchase on one device and completing it on another, and by stimulating customers to make use of multiple e-channels when shopping online.

It is important to develop strategies to facilitate a boundaryless online customer journey for each possible path combination. Figure F-2 illustrates a potential path combination of e-channels and e-channel touchpoints that a customer might use to shop from a retailer's multichannel e-commerce system during the course of the purchase process (Moriarty and Moran 1990). In the example, the customer gets aware of an offering by visiting the mobile website via a smartphone. For receiving product information she or he switches to the retailer's mobile app. Afterwards, she or he uses the tablet app to take a closer look at the

product pictures. The customer prefers to use her or his laptop to evaluate the offering, for

example by reading customer reviews and afterwards to conduct the purchase. In the post-

purchase stage the smartphone app is used to check the delivery status and the tablet to visit

the website for checking the return conditions. As illustrated in Figure F-2 and portrayed in

the prologue of this dissertation, e-channel touchpoints need to be configured and coordinated

to deliver unique benefits by supporting the purchase process in the daily lives of customers.

E-Channel / Touchpoint			Stages of the Online Customer Journey				
E-Channel	Device	Touchpoint	*Pre-Purchase*			*Purchase*	*Post-Purchase*
			Awareness	*Information*	*Evaluation*		
Mobile E-Channel	e.g., Smartphone	e.g., Mobile App					
		e.g., Mobile Website					
	e.g., Tablet	e.g., Tablet App					
		e.g., Tablet Website					
Traditional E-Channel	e.g., Laptop	e.g., Regular Website					

Figure F-2: Exemplary sequence of a boundaryless online customer journey
Source: Based on Moriarty and Moran 1990.

Lastly, it is important to communicate the potential benefits of individual e-channel

touchpoints as well as the advantages to use multiple e-channels during the course of the

customer journey. This would tie existing customers to the multichannel e-commerce system

of a retailer and help to attract new customers, which prefer specific e-channels or the value

deriving from the utilization of multiple e-channels. In this context, retailers could also

encourage customers to switch to a specific e-channel touchpoint by emphasizing its

individual advantages, such as comfort, enjoyment, or convenience. The following illustration

(see Figure F-3) summarizes the key implications for retailers in a managerial guideline for

multichannel e-commerce retailing.

> 1. **Consider what e-channels your customers use to shop online and how they utilize them**
>
> 2. **Provide appropriate and beneficial e-channel touchpoints for all relevant e-channels**
>
> 3. **Design e-channel touchpoints with regard to the specific technological characteristics of the devices**
>
> 4. **Incorporate the situational context of e-channel utilization and provide complementary capabilities**
>
> 5. **Integrate e-channels to develop a frictionless and boundaryless multichannel e-commerce system**

Figure F-3: A managerial guideline for multichannel e-commerce retailing

4. Directions for Future Research in Multichannel E-Commerce

The scope of this dissertation entails some limitations, which provide opportunities and directions for future research. Also, the core results and conclusions of this dissertation raise new questions and offer an additional basis for further research.

Future research can build upon the findings of this dissertation with regard to consumers' utilization of e-channels and e-channel touchpoints by extending the scope to traditional channels, such as physical stores and catalogs. In this context, the issue can be addressed how multichannel retailers should employ multiple e-channel touchpoints to develop a holistic and fully integrated multichannel system across physical and digital channels (Schramm-Klein 2011). Another relevant area for research would be to examine how retailers can keep the brand experience consistent across e-channels and e-channel touchpoints (Carlson and O'Cass 2011).

In this dissertation, consumer behavior has been investigated based on self-reported purchase intentions of individuals. Hence, future studies should analyze actual purchase data and observe online shopper behavior to validate the results of these studies and to generalize the findings. Instruments and methods will be necessary to track the online customer journey across diverse e-channel touchpoints and between multiple devices (Frambach, Roest and Krishnan 2007). In particular, future research should address how retailers can collect and consolidate data from all e-channel touchpoints consumers utilize during their purchase processes to better understand and predict customer behavior as well as to personalize and

enrich the customer experience across e-channels. With regard to the different purchase phases this work focused on the pre-purchase (information) and purchase (transaction) stage. Further research should examine the utilization of e-channels and e-channel touchpoints in the post-purchase stage.

The focus of the current research was especially on qualitative attributes of e-channels and situational factors of their utilization. It is possible that other explanatory variables play a relevant role in consumers' e-channel choice, such as involvement toward the device or situational involvement (King and He 2006). Future research could also assess to what degree e-channels and e-channel touchpoints are utilized simultaneously for online shopping, for example a second screen utilization in which a consumer uses one e-channel to read customer reviews and at the same time another one to compare prices. Therefore, additional insights in the underlying mechanisms of interactions in a multichannel e-commerce system are needed.

Moreover, research could examine if multichannel e-commerce shoppers are more profitable than single e-channel shoppers. For example, market data indicates that consumers who shop online via the mobile e-channel spend twice as much via e-channels than those not buying on mobile devices (Invesp Consulting 2015). Therefore, the questions arise whether passionate online shoppers utilize multiple e-channels or whether the use of diverse e-channels leads to increasing online shopping activities (e.g., more time spent in online stores or a higher share of online purchases). Moreover, it would be interesting to explore if online purchasing behaviors (e.g., amount of spending, purchased product categories, chosen payment options) differ across e-channels or touchpoints. This knowledge would be valuable to reveal shopper segments, which could be treated with specific marketing activities according to their individual characteristics.

The presented observation of online consumer behavior is limited to currently available e-channels and e-channel touchpoints, some in an early stage of the product lifecycle, e.g.,

IETVs. Future research can add by conducting longitudinal studies to answer the following

questions: How changes the set of devices that are used for online shopping? Will new

devices replace old ones or will they be additionally utilized? What is the optimum

(maximum) number of e-channels and e-channel touchpoints that consumers find beneficial to

use at once? Finally, the two newly discovered categories of e-channels, namely, the IETV

e-channel and the complementary e-channel provide fruitful future research areas with regard

to consumer behavior with and across these e-channels.

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