Three Essays on In-Store Information Search in a Digital World:

Effects of Different Information Sources on Customers' Path to Purchase

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Meinen Eltern

Vorwort

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1 Introduction

1.1 Objectives of the Dissertation

The fundamental idea behind this dissertation is to contribute to the debate on the future of retailing (Grewal, Roggeveen, and Nordfält 2017), the field of frontline employee management (Singh et al. 2017), and the influence of the increasing use of in-store mobile online search on customers path to purchase (Bellini and Aiolfi 2017; Grewal et al. 2018). Furthermore, this dissertation is inspired by the first tier research priorities of the marketing science institute and, in support of this, also contributes to research on multichannel retailing (Sands et al. 2016) and effects of digital and personal communication (Batra and Keller 2016). In the context of customers' in-store information search, the main purpose of this dissertation is thus to compare two commonly used information sources, namely consumers' interaction with a frontline employee and online product reviews by previous customers. While comparing them, the investigation focuses on information search, evaluation of alternatives, and purchase decision as parts of the consumer's decision-making process (Engel, Blackwell, and Miniard 1995).

In a first step, this dissertation intends to increase the knowledge on how the type of communication channel influences customers' decision-making process, focusing on information search and purchase channel choice. The answer to the first question of this dissertation provides insights into customers' purchase channel choice. Second, the purpose of the next part is to understand the mechanisms behind customers' information processing strategies. Here, the investigation sheds light on whether customers process information differently when they personally interact with a frontline employee, compared to when accessing information online via mobile devices such as smartphones at brick-and-mortar stores. Third, this dissertation contributes to distinguishing between different information sources and communication channels. In sum, it focuses on three main questions:

1. How does personal interaction with a frontline employee affect customers' purchase channel choice compared to mobile online search at the point of sale?
2. How does an in-store consultation of these different information sources lead to differences in consumers' cognitive information-processing strategies as regards their product choice?
3. How does digital (i.e., smartphone-mediated) communication affect customer' interaction with different information sources compared to personal interaction at the point of sale?

1.2 Content of the Dissertation

To successfully address the purpose of the previously listed questions, the content of the dissertation is structured into three individual essays. The three essays consist of seven empirical studies, comprising a total of 1,962 participants. Table 1 shows a summary of these studies.

Table 1 – Summary of Conducted Studies

		Method	Sample	N
Essay I "Information Channels and Their Influence on Consumers' Purchase Channel Choice"	Study 1	Qualitative in-depth interviews	Snowball sample	8
	Study 2	Field experiment (Scenario-based experiment)	Undergraduate students	523
Essay II "Collaborative Decision-Making as an Effective Information-Processing Strategy to Increase Customers' Choice Confidence"	Study 1	Online survey (Qualitative text analysis)	Undergraduate students	350*
	Study 2	Field experiment (Scenario-based experiment)	Undergraduate students	585
Essay III "The Power of Control in Digital Communication and Its Influence on Persuasiveness"	Study 1	Online survey (Scenario-based experiment)	Undergraduate students	232
	Study 2a	Online survey (Scenario-based experiment)	Undergraduate students	354
	Study 2b	Online survey (Scenario-based experiment)	Non-students	260

The first essay deals with in-store communication channels (offline and online) and their impact on customers' choice of purchase channel. Based on switching costs theory and qualitative in-depth interviews, a conceptual model is developed and tested in an aligned scenario-based field experiment. Table 2 gives an overview of the conducted investigations.

Table 2 – Outline of Studies in Essay I

Essay I: "Information Channels and Their Influence on Consumers' Purchase Channel Choice"		
Study 1: (qualitative)	Purpose:	Identification of both, frequently used communication channels at the point of sale and purchase channel switching costs and content related drivers for an in-store purchase decision.
	Method:	Qualitative in-depth interviews.
	Context:	Remembering the last brick-and-mortar store visit.
	Sample:	N = 8, M_{age} = 33.88, 50% female, $M_{duration}$ = 30 minutes, snowball sample.
	Analysis:	Directed qualitative content analysis - Three-step approach by Wolcott (1994).
Study 2: (quantitative)	Purpose:	Hypotheses testing examination of the effect of channel lock-in effects and the impact of channel switching costs on customers' purchase channel choice.
	Method:	Modified form of scenario-based field experiment.
	Context:	Participation in a task-oriented store visit at an electronics retailer in order to search for a new TV set / digital radio.
	Sample:	N = 523, M_{age} = 20.71 years, 42.9% female, undergraduates mean time spend at store = 35.28 minutes, N_{stores} = 2.
	Analysis:	Partial least squares (PLS) path modeling with SmartPLS 3.2.6 software by Ringle, Wende, and Becker (2015), Multigroup Analysis (MGA) by Sarstedt, Henseler, and Ringle (2011).

Falling back on the two most frequently used communication channels in-store, the second essay focusses on how online product reviews and frontline employee consultations affect customers' information processing and the certainty of their product choice. Focusing on the reduction of choice overload, a mixed-method design was used with the aim to identify different

information-processing strategies and test the corresponding hypotheses in a realistic shopping scenario. Table 3 summarizes the empirical procedure of Essay II.

Table 3 – Outline of Studies in Essay II

Essay II: "Collaborative Decision-Making as an Effective Information Processing Strategy to Increase Customers' Choice Confidence"		
Study 1: (qualitative)	Purpose:	Identification of different mechanisms in cognitive information processing strategies that consumers utilize, depending on different communication channels.
	Method:	Shopping experience, followed by an online questionnaire with open-ended questions.
	Context:	Remembering the last brick-and-mortar store visit.
	Sample:	N = 350, M_{age} = 20.68, 43.1% female, undergraduates, mean words per question = 240.4.
	Notes:	Data were jointly collected with Study 2 in Essay I. However, none of the used data in this paper were used in Essay I. Participants from the control groups were excluded.
	Analysis:	Directed qualitative content analysis - Three-step approach by Wolcott (1994).
Study 2: (quantitative)	Purpose:	Hypotheses testing examination of the effect of collaborative decision-making and its impact on choice overload and customers' product choice confidence.
	Method:	Modified form of scenario-based field experiment.
	Context:	Participation in a task-oriented store visit at an electronics retailer in order to search for a new TV set / washing machine.
	Sample:	N = 585, M_{age} = 20.65 years, 41.2% female, undergraduates, mean time spend at store = 34.37 minutes, N_{stores} = 45.
	Analysis:	MANOVA, Partial least squares (PLS) path modeling with SmartPLS 3.2.6 software by Ringle, Wende, and Becker (2015), Multigroup Analysis (MGA) by Sarstedt, Henseler, and Ringle (2011).

While previous research has commonly linked the information source to a corresponding communication channel (e.g., frontline employees to personal interaction and recommendations by customers to online product reviews), Essay III provides insight into how the interaction between different information sources and customers are affected by the communication channel. In this sense, it is examined how digital communication channels influence the

interaction between frontline employees and customers to increase knowledge about communication channel effects that are independent of the information source. An overview of the conducted studies is shown in Table 4.

Table 4 – Outline of Studies in Essay III

Essay III: "The Power of Control in Digital Communication and Its Influence on Persuasiveness"		
Study 1: (quantitative)	Purpose:	Pilot study to demonstrate evidence for communication channel effects on the purchase consultation process.
	Method:	Online experiment, between subject 2 (information source: frontline employee vs. customer) x 2 (communication channel: personal vs. mobile device), full factorial design.
	Context:	Participants imagine themselves visiting a consumer electronics store to search for a new washing machine.
	Sample:	N = 232, M_{age} = 21.2, 43.1% female, undergraduates.
	Analysis:	Spotlight analysis with paired t-tests.
Study 2a: (quantitative)	Purpose:	Hypotheses testing examination of the moderating effect of perceived control over the communication process on the relationship between source heuristics and persuasiveness.
	Method:	Online experiment, between subject 2 (information source: frontline employee vs. customer) x 2 (communication channel: personal vs. mobile device), full factorial design.
	Context:	Similar to Study 1, product: washing machine.
	Sample:	N = 354, M_{age} = 23.4 years, 58.5% female, undergraduates.
	Analysis:	AN(C)OVA, conditional process analysis by Hayes, Preacher, and Myers (2011), partial least squares (PLS) path modeling with SmartPLS 3.2.6 software by Ringle, Wende, and Becker (2015).
Study 2b: (quantitative)	Purpose:	Increasing validity of the results of Study 2a.
	Method:	Similar to Study 2a.
	Context:	Similar to Study 1, product: digital single-lens reflex camera.
	Sample:	N = 260, M_{age} = 35.2 years, 58.1% female, non-student.
	Analysis:	AN(C)OVA, conditional process analysis by Hayes, Preacher, and Myers (2011), partial least squares (PLS) path modeling with SmartPLS 3.2.6 software by Ringle, Wende, and Becker (2015).

2 Essay I – In-Store Information Search in a Digital World: Information Channels and Their Influence on Consumers' Purchase Channel Choice

2.1 Abstract

This paper is an investigation about the relationship between consumers' in-store information channel usage and its impact on their chosen purchase channel. It contributes to increasing the knowledge on whether information search drives consumers to use the same channel (offline or online) for both information search and purchase. Building upon switching costs theory and drawing from eight qualitative in-depth interviews, a conceptual model is developed and tested in a scenario-based field experiment with 523 participants. The results of this study show that mobile online search steers consumers toward switching to a competitor's online store. In contrast, frontline employee interaction as information source increases the number of purchases at the brick-and-mortar store. Next to the information source, online price advantage, delivery time and traveling time to the store are found to have a significant influence on consumers' purchase channel choice. In this respect, the previously identified switching costs have proven to be suitable mediators for the estimated relationships. Finally, a multi-group analysis is used to demonstrate product-related differences in the structural model.

Keywords: *mobile Internet search, frontline employee interaction, external information processing, purchase channel choice, switching costs, channel lock-in.*

Additional Note:

A prior version of this paper, co-authored by Sören Köcher (TU Dortmund University); Kessenbrock, A., Köcher, S.: “Information Search at the Point of Sale: How Information Source Influences Customers’ Purchase Channel Switching Intentions”), has been presented and discussed at the Academy of Marketing Science (AMS) Annual Conference in San Diego (2017).

2.2 Introduction

When buying a new product, consumers access or consult a multitude of information sources to make better informed decisions (Broilo, Espartel, and Basso 2016). However, the process of searching for information has changed vastly over the past decades due to the wide range of available information channels (e.g., Jerath, Ma, and Park 2014; Noble, Griffith, and Adjei 2006). The omnipresent Internet is the most frequently consulted source of information, and the extent of mobile network coverage makes searching online or using smartphone applications to gather appropriate information possible at any time and from anywhere (Park and Yang 2006). Extensive studies have been conducted on the topics of mobile marketing communication (e.g., Goldfarb and Tucker 2011; Holmes, Byrne, and Rowley 2013; Luo et al. 2013) and mobile shopping (e.g., Groß 2016; Wang, Malthouse, and Krishnamurthi 2015). However, consumers' mobile search behavior while shopping at brick-and-mortar stores and the influence of mobile searching on shopping behavior have not been sufficiently investigated (Daurer et al. 2016). Mobile devices provide instant data for those looking for product information (e.g., professional product tests, detailed product information, or product reviews) while shopping at the point of sale (Hathaway 2014). However, brick-and-mortar retailers worry they will lose consumers since little is known about the influence of using mobile devices for a purchase-related information search in-store. Thus, one the central research questions is what makes consumers stay and complete the intended purchase in the store, and which factors drive them to instantly switch to a competitor's online store. A common approach to investigating and better understanding such switching intention is the concept of switching costs (Burnham, Frels, and Mahajan 2003). However, research about switching costs is primarily limited to switching a service provider after using its service for a certain period of time (e.g., Jones et al. 2007; Wang et al. 2011) or to consumers' intention to switch retailer for the next purchase (e.g., Seiders et al. 2005). While a large number of studies focus on

consumers' purchase channel choice (e.g., Chocarro, Cortiñas, and Villanueva 2013; Forman, Ghose, and Goldfarb 2009) and retailers' attempts to steer consumers to their own cost-efficient purchase channels (e.g., Ansari, Mela, and Neslin 2008; Herhausen, Schögel, and Schulten 2012), research on the influence of the use of information channel (i.e., online or offline) on choice of purchase channel (i.e., online or offline) and channel switching intentions is lacking (Moon 2004; Seock and Norton 2007). In literature on digital marketing and consumers' multichannel behavior, Lamberton and Stephen (2016) address this research gap, drawing attention to the relevance of linking the online and offline world.

This paper's contribution to the literature is twofold. First, it bridges a research gap by increasing our knowledge on whether the in-store information search that accompanies the purchase decision process drives consumers to use the same channel (i.e., offline or online) for the actual purchase. Therefore, the results of this study show the impact on consumers' choice of purchase channel rendered by mobile in-store information search, compared to frontline employee interaction at the point of sale. While the concept of switching costs is mostly used to explain consumers' switching intentions for long-term consumer relationships and future decisions, the second contribution of this study is to identify switching costs incurred by information search, and to evaluate purchase channel characteristics. The paper is organized as follows. First, we review the relevant literature on consumers' in-store information search behavior, purchase channel choice, and consumer switching costs. Based on this review, we developed a framework centered toward consumers' purchase channel choice and potential information channel effects. Afterwards, we derive hypotheses based on a qualitative approach and test them in a scenario-based field study. Finally, we conclude with a discussion of managerial implications, limitations, and future research directions.

2.3 Relevant Background

According to extant literature, consumers' path to purchase has become increasingly complex (Shankar et al. 2011; Srinivasan, Rutz, and Pauwels 2016). In the context of buying behavior theories, the consumer decision process model developed by Engel, Blackwell, and Miniard (1995) provides a conceptual framework to better understand the buying process and to classify contributing factors that may affect purchase behavior in a multichannel environment (Puccinelli et al. 2009; Schröder and Zaharia 2008). Following this framework, the consumer decision process for purchasing a product involves five stages: (1) need recognition, (2) information search, (3) evaluation, (4) purchase decision, and (5) post-purchase support (Engel, Blackwell, and Miniard 1995). By examining the theoretical work on the buying process of past decades, Puccinelli et al. (2009) highlight dominant theories and their role during various stages of the consumer decision process. They noticed that, for example, shopping goals (such as social interaction) and information processing are important topics that have already been associated with consumers' behavior in all stages of the decision process. This study includes a partial examination of the stages of information search, evaluation, and purchase decision, focusing on the link between an information channel and a purchase channel in an in-store shopping situation.

2.3.1 Information Channel

While the minority of consumers relies on only one information channel, most use multiple channels at different stages of the purchase process. These individuals are called multichannel consumers. More precisely, "click and brick" multichannel consumers tend to search online but purchase offline (Rippé et al. 2016). The number of consumers who use the Internet for information search is increasing, as that information is more structured and convenient than searching in-store (Rippé et al. 2016). However, this type of consumer tries to avoid the limitations of this channel (e.g., delivery time), and thus often purchases offline (Peterson and

Merino 2003). In contrast, "showrooming" describes the process of consumers who take advantage of retailers' consumer advisory services but purchase at competing online stores for different reasons (Gensler, Neslin, and Verhoef 2017). This channel switching behavior has negative consequences for retailers, such as a loss in revenue and a decrease in salespersons' performance (Rapp et al. 2015).

Peterson and Merino (2003) observed that consumer information search behavior must be reconsidered (related to in-store search behavior) in response to the growing number of information channels and multichannel consumers. When the Internet first became an essential information channel, consumers used it as a shopping preparation tool, which roughly means that "click and brick" consumers only used it in anticipation of a store visit to build internal expertise, and create the basis for a good purchase decision. However, with mobile technology, an increasing number of researchers have studied the effects of digital information searches while shopping in a brick-and-mortar store. Since consumers now use mobile devices to quickly search online, more and more consumers rely on mobile search in the store. This is a logical step, as information search depends on individuals' motivation (e.g., to make the best purchase decision) as well as on their ability to search for appropriate information (Bettman and Park 1980). In this context, the ability to search for information means a knowledge of search procedures and information sources (MacInnis, Moorman, and Jaworski 1991; Schmidt and Spreng 1996). Accordingly, mobile devices were found to be a more convenient channel for information search than for purchasing, which might be an issue, as the usage of "mobile device channels may interfere with existing channels" (Lemon and Verhoef 2016, p. 86). Few studies show the effect of in-store mobile search behavior on decision processes. Kannan, Reinartz, and Verhoef (2016) therefore identified the interaction between channels and devices as an important field for future research.

Rippé et al. (2017) found that intensive mobile search behavior has a positive impact on in-store purchase intentions. However, the results of their study are limited to information search

behavior that involves personal interaction with a salesperson and mobile device usage at the same time. In contrast, Bellini and Aiolfi (2017) highlighted the fact that consumers' mobile usage (in a shopping-related manner) decreases their number of purchases when compared to consumers who do not use a mobile device in the store. Similarly, Broeckelmann and Groeppel-Klein (2008) found that in-store mobile price comparison, in conjunction with an online price advantage, resulted in higher switching intentions to a competitive online shop. However, their study did not distinguish between the types of shopping-related information such as price comparison (which is attributed to the purchase channel) and product-related information, such as consumer product reviews.

2.3.2 Purchase Channel Choice and Channel Lock-In Effect

Following the multichannel phenomenon, researchers have differentiated between consumers' channel choice in the different stages within the decision-making process. In this context, Frambach, Roest, and Krishnan (2007) noted a gap between the channel usage intention of the pre-purchase channel (to gather information) and the purchase channel. Their findings show that consumers prefer the online channel in the stages of pre-purchase but have a higher intention to purchase the products in brick-and-mortar stores. Pauwels et al. (2011) also noted that an online information website of a retailer can increase its offline revenues.

Empirical research has examined several drivers of purchase channel choice. The following dominant determinants influence the choice of purchase channel: (1) purchase efforts such as travel time to the brick-and-mortar store (e.g., Keen et al. 2004; Verhoef, Neslin, and Vroomen 2005), (2) price advantage (e.g., Thomas and Sullivan 2005; van Nierop et al. 2011; Verhoef, Neslin, and Vroomen 2005), and (3) delivery time (e.g., Burke 2002; Gupta, Su, and Walter 2004; Verhoef, Neslin, and Vroomen 2005). In most studies the researchers used the theory of reasoned action to explain the stated channel attributes to consumers' purchase channel choice (Verhoef, Neslin, and Vroomen 2007). Since researchers have tried to separate the drivers for

information channel and purchase channel choice and examine the corresponding attributes, the relationship between the information channel and the purchase channel is mostly unexamined. Neslin et al. (2006) argue that consumers evaluate channel alternatives in all stages of the buying process, and therefore make a new channel choice when re-entering the purchase funnel. However, Shim et al. (2001) found that online information search is also a key driver for purchasing online. Verhoef, Neslin, and Vroomen (2007) used the term of "channel lock-in" to describe the likelihood of consumers preferring the same channels for different stages of the buying process, independent of channel attributions or experience, and Gensler, Verhoef, and Böhm (2012) called it "channel spillover effects." The authors explained this effect by the "consumers' quest for consistency" (Gensler, Verhoef, and Böhm 2012, p. 992; Verhoef, Neslin, and Vroomen 2007). Because of the consumers' quest for consistency, they tend to use the same channel for subsequent stages of the buying process, even if switching to another channel is more efficient (Gensler, Verhoef, and Böhm 2012). Li and Kannan (2014) also noted an asymmetry between spillover effects across similar and very different channels. They argued that changing to a very different channel can increase consumers' switching costs due to a cognitive channel lock-in. This is in line with the "status quo bias theory", which states that individuals prefer situations or decisions that already take place (Kahneman, Knetsch, and Thaler 1991). Other research demonstrated evidence for the channel lock-in effect, as mobile in-store search at the store has a positive influence on mobile payment (Kerviler, Demoulin, and Zidda 2016).

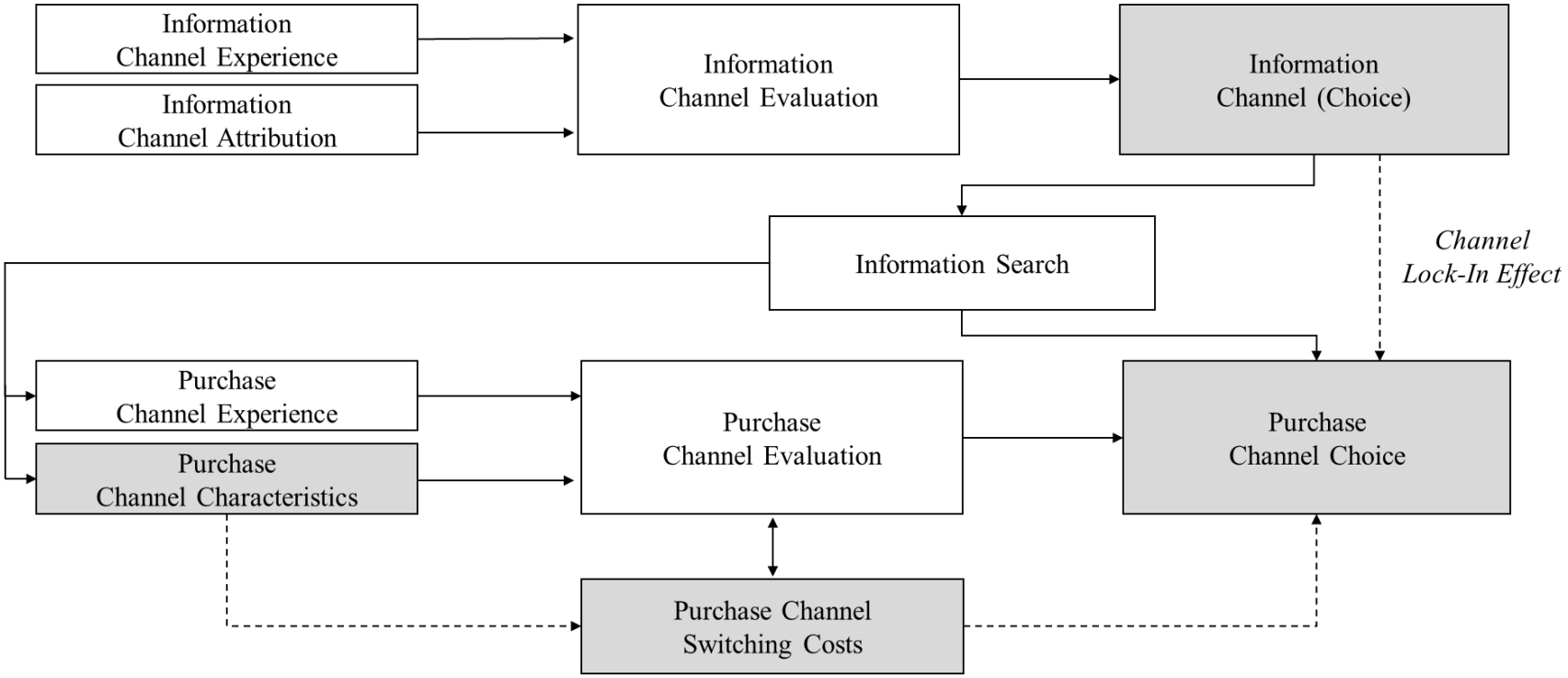
2.3.3 Switching Costs

Switching costs are "one-time costs that consumers associate with the process of switching from one provider to another" (Burnham, Frels, and Mahajan 2003, p. 110). Burnham, Frels, and Mahajan (2003) differentiated between three types: (1) procedural switching costs, the loss in time and effort; (2) financial switching costs, loss of monetary resources; and (3) relational

switching costs, the psychological costs that arise while consumers interact with individuals (e.g., frontline employees) or identify with companies and brands. Klemperer (1987) argued that switching costs occur with completed purchases. Therefore, most studies on consumers' switching cost focus on consumer loyalty and repurchase intentions (e.g., Blut et al. 2015; Caruana 2003; Gruen, Osmonbekov, and Czaplewski 2006). Retailers try to raise switching costs by means of customer loyalty programs or service contracts (Brynjolfsson, Hu, and Rahman 2013).

From a theoretical point of view, Jones, Mothersbaugh, and Beatty (2002) noted that switching costs act as barriers that prevent consumers from quitting. Therefore, Falk et al. (2007) identified switching costs as the explanation for consumers' asymmetry in their purchase channel preference and choice. According to Falk et al., consumers' purchase channel switching costs are understood to prevent switching to another purchase channel, and are thereby considered relevant when evaluating the purchase channel. Purchase channel evaluation is the cognitive balance of perceived switching costs that are determined by consumers' channel attribution. The conceptual model in Figure 1 provides an overview of how consumers decide between different purchase channel alternatives in an in-store context while focusing on both (1) channel switching costs, which are determined by channel characteristics, and (2) channel lock-in effects.

Figure 1 – Conceptual Framework of an In-Store Purchase Channel Choice



Notes: Constructs in the gray boxes were investigated in this study and dotted lines highlight the assumed relationships.

2.4 Qualitative Study: Identification of Information Channel Effects and Purchase Channel Switching Costs

2.4.1 Data Collection and Analysis

Because prior research has not sufficiently addressed channel switching costs that occur in the context of an in-store purchase decision, we employed an exploratory sequential mixed-methods design (Creswell 2014). We started with a qualitative approach to better understand consumers' purchase channel characteristics and their influence on channel switching costs while shopping in a brick-and-mortar store. Thus, we conducted eight qualitative in-depth interviews with participants of varying ages, genders, and income to account for different consumer types. In accordance with the exploratory nature of the qualitative study, semi-structured interviews allowed us to explore contextual switching costs and related channel characteristics by analyzing participants' shopping experience. Therefore, we asked participants to remember their last brick-and-mortar store visit. In order to identify relevant channel characteristics and contextual switching costs, we directly asked for a situation in which they left the store to purchase the product online. In this context, we also asked participants about their mobile device usage and frontline employee interaction and the reasons for deciding to buy the product online.

All interviews were audio recorded and transcribed. To analyze the data, we followed a three-step process as proposed by (Wolcott 1994). First, themed as description, we employed iterative descriptive coding (Miles, Huberman, and Saldana 2013) for categorizing content. The second step of the analysis was used to systematically identify overarching themes and relationships in the data. In the third step, the interpretation, the co-authors jointly made sense of the findings by linking them to existing literature (Wolcott 1994). The results of this exploratory study are used to develop a conceptual framework and to derive hypotheses through

the combination with existing literature, which is followed by a quantitative phase of testing the hypotheses.

2.4.2 Discussion and Development of Hypotheses

The analysis of the qualitative data showed two major sources of information used in a brick-and-mortar store: gathering information from a frontline employee, and/or using mobile devices to search the Internet for appropriate information. Moreover, we found corresponding effects of the way these sources of information (SOI) affect consumers' purchase channel choice (PCC). In addition, we detected three categories of determinants that affect the purchase channel choice: online price advantage, travel time to the store, and online delivery time. Matching the qualitative data with previous literature, we identified four types of switching costs that could explain the effects of channel characteristics on consumers' purchase channel choice.

2.4.2.1 The Effects of Frontline Employee Interaction

When asked about their last planned brick-and-mortar store visit (e.g., at a consumer electronics store), participants identified information search as one of the dominant issues. The participants argued that technical information and product evaluations are necessary to choose the product most suited for their purpose. In order to obtain relevant information, consumers either ask frontline employees for advice and/or use their mobile devices to search online for information. In accordance with existing literature, consumers may use the Internet only for product information search but purchase offline, search through offline channels and purchase online, or search and purchase in the same channel (Moon 2004). However, the qualitative data showed that an interaction with a frontline employee as source of information seems to decrease the switching intention to a competitive online channel, since consumers appreciate the personal interaction. For example, one participant stated,

"I think it's a shame to take advantage of the consultation but purchase online anyway." (I6).

This is in line with the concept of personal relationship loss costs (PRLC), which occur as the interaction with the employee creates a form of familiarity and gratitude (Burnham, Frels, and Mahajan 2003). One participant stated,

"The employee takes care to help me and that makes me grateful." (I3).

We therefore expect that this personal interaction has a negative impact on the purchase channel choice due to the personal relationship loss costs. This results in our first hypothesis:

Hypothesis 1: ***(a)*** *Gathering information from a frontline employee has a negative effect on switching to a competitor's online purchase channel.*

(b) *This effect is mediated by personal relationship loss costs.*

2.4.2.2 The Effects of Mobile Internet Search

However, an Internet search on a mobile device at the point of sale may also steer the consumer to purchase the product online, as shown by a participant's response:

"I use my smartphone to go on Amazon.com to see the product reviews; How many stars? Any technical restrictions? […] and I sometimes caught myself that I instantly ordered it online." (I1).

The store visit seems to shift more and more into the background while consumers are focusing on the mobile web search:

"In my mind, I had already left the store and just focused on the mobile web search." (I8).

In order to examine whether consumers' information search through the Internet results in product purchase through the Internet, Moon (2004) applied the decision-making model by

Payne, Bettman, and Johnson (1991). The author postulated that a relationship exists between an information channel and purchase channel that primarily depends on specific aspects, such as product category and benefit of the channel (Moon 2004). As already mentioned, one reason for consumers choosing only one channel for different stages within the purchase process might be the channel lock-in effect. The second hypothesis concerns this relationship:

***Hypothesis 2**: Gathering information in-store from a mobile Internet search (at a competitor's online purchase channel) has a positive effect on switching to a competitor's online purchase channel.*

2.4.2.3 The Mediating Role of Channel Switching Costs

In examining the effect of information search in a brick-and-mortar store, product-related information as well as differences between the brick-and-mortar store and online competitors are relevant in the decision process. Therefore, the consumers' need for channel-related information seems to be an essential component for the purchase decision process. For instance, consumers are interested in price differences across channels and product delivery time. Most of the participants noted that online price advantages are the most common reason to switch, whereas online delivery time might reduce the switching intention.

> *"I usually use my smartphone to go on Amazon or a price comparison site […] and if I see that I can save money, I purchase online." (I1).*
>
> *"Depends on the price difference, but I'm not willing to pay much more for the same product!" (I6).*
>
> *"If you purchase online, you will get your product the next day, sometimes in 3-4 days. Could be a reason why I purchase offline and pay a little bit more." (I4).*

In line with the literature on switching costs, the financial disadvantages (of the current retailer) and loss of benefits due to having to wait for delivery if ordering online, may explain

the effects of price differences and delivery time on consumers' switching intentions (Burnham, Frels, and Mahajan 2003). Moreover, the time and efforts that have already been incurred are non-recoupable.

> *"If it takes a lot of time to get there [to the retailer], I won't come back empty handed." (I2).*

In this context, consumers have already spent time and effort to get to the store. These sunk costs increase by the time that consumers have spent to travel to the store and could explain the effect on consumers' switching intentions (Jones, Mothersbaugh, and Beatty 2002). In summary, the following relationships are expected:

Hypothesis 3**:* ***(a) *A greater online price advantage (at a competitor's online purchase channel) has a positive effect on switching to a competitor's online purchase channel.*

(b) *This effect is mediated by monetary loss costs.*

Hypothesis 4**:* ***(a) *A longer delivery time (at a competitor's online purchase channel) has a negative effect on switching to a competitor's online purchase channel.*

(b) *This effect is mediated by time loss costs.*

Hypothesis 5**:* ***(a) *A longer travel time already spent to go to the store has a negative effect on switching to a competitor's online purchase channel.*

(b) *This effect is mediated by sunk costs.*

2.5 Quantitative Study: Channel Switching Costs and Their Impact on Purchase Channel Choice

2.5.1 Procedure, Sample Characteristics and Measures

2.5.1.1 Procedure

General research design. To test the proposed hypotheses, a single-factor between-subjects scenario-based field experiment was conducted. A total of 575 undergraduate students at a German university completed the experimental task and a follow-up questionnaire for extra course credit. After informing the participants about the different functions of mystery shoppers, they were asked to take part in a real-life mystery shopper exercise with different tasks and assignments. As a requirement, participants had to enroll online and fill in a short questionnaire about their purchase behavior in general, smartphone ownership, availability of mobile web on their smartphone, and demographics. Afterwards, participants were randomly assigned to one of three experimental conditions. Since 52 participants stated that they did not have access to the mobile web, which was a necessary condition for taking part in the experimental study, these participants were excluded from the study.

***Experimental manipulation and dramaturgy*.** In contrast to the traditional experimental field approach, we manipulated the instructions for the participants and not local conditions (e.g., store environment). We manipulated the source of information at the point of sale: (a) frontline employee interaction, (b) mobile Internet search, and (c) only in-store product descriptions (control group). Furthermore, we tested our proposed model across two different product price categories (TV set as a higher-priced product and a digital audio broadcasting (DAB+) radio as a lower-priced product). In this sense, we randomized all registrations and sent out six different tasks via personalized e-mails to the participating students.

Within the given task, the participants were instructed to visit a local store of a nationwide consumer electronics retailer, acting as a mystery shopper. With the restriction of visiting a

local store in their hometown (but not more than 60 kilometers away), we tried to ensure that all participants visited different stores, while giving them the freedom to choose a store at the same time. Participants were asked to put themselves in the position of a consumer looking for a TV set (48-55 inches) or a DAB+ radio. Moreover, depending on the experimental conditions, participants were instructed to (a) consult a frontline employee to gather further product information, (b) use their mobile devices to search online for product reviews in the store, or (c) only use product descriptions in the store (control group) to choose a product. Additionally, all participants were asked to compare prices for the product with their smartphone to subsequently decide whether they wanted to purchase the product online or at the store. For background information, they had to note the product's model name, price at the store, price online, travel time to the store, time spent in the store, and product delivery time when buying online.

2.5.1.2 Sample Characteristics

The participants were undergraduate students enrolled in an introductory marketing course at a German university. Based on 747 pre-registrations (who complete the pre-shopping questionnaire) and a return rate of 70%, the final sample for the study included 523 participants (M_{age} = 20.71 years, 42.9% female). All of them completed the individual tasks and answered the pre- and post-task questionnaires within the given time of two weeks after registration for the "mystery shopping bonus assignment." While using a student sample might be criticized for some reasons, previous studies provide support for drawing on student samples in experimental designs (Barsade 2002), in particular for examining causal relationships in human decision-making (Ashton and Kramer 1980), which is the case in this study. Following the instruction to visit a local store in their hometown, the participants visited 52 different stores with an average of 35.28 minutes (SD = 17.55) spent in the store and 21.15 minutes (SD = 13.13) to get there.

2.5.1.3 Measures

***Pre-shopping questionnaire*.** As already mentioned, participants had to finish a pre-task questionnaire during registration. We used a three-item scale of price comparison from Noble, Griffith, and Adjei (2006), successfully used by other authors (i.e., Heitz-Spahn 2013) to measure participants' motivation to compare prices of different retailers. The attitude toward the company was measured for both the retail chain and the alternative online retailer by adopting three items of the original five-item scale from Pope, Voges, and Brown (2004). All items were measured on a seven-point agree/disagree scale. However, the measurement used for the priority in the source of information was assessed on seven-point high/low priority scales for online reviews and frontline employees as a source of information (Lee and Rao 2012). Finally, demographics and filter items related to participants' ability to complete a mobile web search were queried.

***Post-shopping questionnaire*.** All participants had to complete the post-task questionnaire, which was introduced as the written part of the assignment, no later than two hours after they had finished the practical part. In order to help the participants, recall the shopping situation, we started this survey with open questions. For example, participants in the frontline employee condition were asked to explain the interaction with the employee and how helpful it was in deciding on a product. The scales for personal relationship loss costs, monetary loss costs, and benefit loss costs were adapted from Burnham, Frels, and Mahajan (2003). Although the original benefit loss costs relate to losing accumulated loyalty points, we measured for time (benefit) loss costs due to the results of the former qualitative study and the experimental context. Moreover, we used three items from Jones, Mothersbaugh, and Beatty's (2002) sunk costs scale to measure participants' effort loss costs. All switching cost items used in this study were measured on a seven-point agree/disagree scale and are shown in Table 6. Following Soman (2001), we measured purchase channel choice on a nine-point single-item scale by

asking participants where they tended to purchase the product (1 = strongly tended to purchase at [name of local retailer], 9 = strongly tended to purchase at [name of the online retailer]).

2.5.2 Data Analysis and Results

Following several experimental studies (e.g., Bagozzi and Yi 1989; Eggert, Steinhoff, and Garnefeld 2015; Wagner, Hennig-Thurau, and Rudolph 2009), we tested our proposed model by using partial least squares (PLS) path modeling with SmartPLS 3.2.6 software (Ringle, Wende, and Becker 2015), a multivariate analysis technique for testing structural models (Barroso and Picón 2012), which is suitable especially for complex structural equation models (Bagozzi and Yi 1991; Fornell and Cha 1994).

PLS simultaneously enables the assessment of the relationship between the indicators of a model and the constructs (Hair et al. 2016) and "permits the use of nominal data" that we need to examine the impacts (or effects) of the source of information and other measured latent variables such as switching costs on switching intention (Fornell and Bookstein 1982; Hennig-Thurau, Houston, and Walsh 2006). For the level of source of information at the point of sale, we used dichotomization to dissolve the $\gamma = 3$ categories into γ - 1 distinct 0/1-coded dummy variables M 1 and M 2 with the control group as the reference category (see Table 5 – Dummy Variables Coding Scheme). As recommended, this approach is mostly used to examine the effects of categorical variables (Henseler and Fassott 2010) and allows us to estimate the structural model of the overall sample.

In order to analyze the results systematically, we first evaluated the reliability and validity of the reflective measurement model (see Chapter 2.5.2.1). Next, we evaluated the structural model by examining the coefficients of determination as well as size and significance of path coefficients (see Chapter 2.5.2.2). The analyses in this study are based on 5,000 bootstrap samples to test for statistical significances of indicators and path coefficients (Hair et al. 2016).

Table 5 – Dummy Variables Coding Scheme

Original variable M		**Coded dummy variables:**	
		M 1 *frontline employee vs. control group*	*M 2* *mobile device vs. control group*
Conditions:	1 (no external information)	0	0
	2 (frontline employee)	1	0
	3 (mobile search)	0	1

Notes: Condition 1 (no external information) is determined as the control group.

Due to the setting of data collection and potential differences between the product types, an aggregate data analysis may lead to neutralized group-specific effects (Hair et al. 2017). For this reason, we also conducted a multi-group analysis (MGA) in partial least squares path modeling (see Chapter 2.5.2.3). This allows for the identification of significant differences of path strength between group-specific models. In this case, we used product type as a distinct variable to form the segmentation.

2.5.2.1 Measurement Model

We evaluated our measurement models regarding internal consistency in forms of Cronbach's alpha and composite reliability, indicator reliability, and average variance extracted (AVE) as part of convergent and discriminant validity (Hair et al. 2016). The loadings of all indicator items on the latent variables are higher than .70. In support of high validity and reliability of the data collected, all independent variables have a composite reliability greater than .79 and a Cronbach's alpha value greater than .69.[1]

[1] Cronbach's coefficient alpha is very sensitive to the number of indicators (Hair et al. 2016). While Cronbach's alpha of adopted scale for monetary loss costs is lower than 0.7 ($\alpha = 0.59$), composite reliability is more appropriate to test for construct reliability of a two-item scale Eisinga, Te Grotenhuis, and Pelzer (2013).

Table 6 – Switching Cost Items, Loadings, and Reliability

Constructs and Items	Loadings	*t*-value	CAs	CRs	AVE
Sunk Costs *Adapted from (Jones, Mothersbaugh, and Beatty 2002)*			.903	.939	.837
A lot of energy, time and effort have gone into getting to the store.	.930	125.998			
Overall, I have invested a lot get to the store.	.929	123.535			
I have not invested much to get to the store. (r)	.885	52.018			
Monetary Loss Costs *Adapted from (Burnham, Frels, and Mahajan 2003)*			.592	.828	.707
Purchasing the product at the online retailer would involve additional expenses.	.792	34.228			
I would have saved money if I switched to the online retailer instead of purchasing at this brick-and-mortar store. (r)	.887	89.786			
Personal Relationship Loss Costs *Adapted from (Burnham, Frels, and Mahajan 2003)*			.905	.933	.776
I would miss working with the frontline employee at this store if I switched to the online retailer.	.907	81.382			
The employees at this current store matter to me.	.915	86.573			
I feel comfortable interacting with the employees at this store.	.837	42.417			
I like talking to the employees in the store.	.864	52.437			
Time (Benefit) Loss Costs *Adapted from (Burnham, Frels, and Mahajan 2003)*			.715	.835	.629
Switching to the online retailer would mean losing time to get the product.	.850	54.797			
I will lose time if I switch to the online retailer.	.732	27.759			
How much time would you lose if you switched to the online retailer? (a little … a lot).	.794	35.901			

Notes: CA = Cronbach's Alpha, CR = Construct Reliability, AVE = Average Variance Extracted.

Furthermore, AVE of the constructs was used to test for convergent validity. While the minimum AVE of the measured constructs was .63, all constructs exceed the minimum of .5, which indicates very high convergent validity (Hair et al. 2016). Table 6 shows the results of the factor loadings, *t*-values, reliability of the measurement model, means, and standard deviation. To assess discriminant validity, meaning that a construct is statistically different from the others and not represented by other constructs in the model, we first examined the cross-loadings of all indicators. The analysis of the cross-loadings shows that discriminant validity has been confirmed, as each indicator load higher on its respective construct.

Moreover, we achieved discriminant validity according to the Fornell-Larcker criterion, since the squared correlations between each pair of constructs are smaller than the AVE of the corresponding constructs (Fornell and Larcker 1981). As shown in Table 7, the AVE values range from .63 to .84, and the highest squared construct correlation demonstrates a value of .33. Therefore, all measures were found to satisfy commonly accepted criteria for reliability and validity, since they exceeded the limits of acceptance.

Last, we conducted several tests to avoid common method bias (Harman 1976). As part of a single-factor test, an exploratory factor analysis indicated a multi-factor variable structure and a total of 27.79% of variance explained by the first factor. Furthermore, adding a marker variable (attitude toward the monorail service at the university) as a control variable did not lead to significant changes in any relationship of the model. Since the post-hoc approach by Lindell and Whitney (2001) revealed a correlation of .077 as the highest correlation among any of the variables in the model with our marker variable, no indicator shows a high common method variance.

Table 7 – Squared Construct Correlations and Average Extracted Variance Values

	Purchase Channel Choice	Online Delivery Time	Monetary Loss Costs	Online Price Advantage	Personal Relationship Loss Costs	Source of Information	Sunk Costs	Time Loss Costs	Travel Time to the Store
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(2)	.010								
(3)	.323	.013							
(4)	.288	.020	.334*						
(5)	.089	.003	.005	.001					
(6)	.015	.001	.000	.002	.001				
(7)	.011	.005	.004	.000	.011	.005			
(8)	.136	.215	.084	.052	.014	.008	.001		
(9)	.001	.002	.004	.002	.003	.006	.283	.003	
AVE	1.000	1.000	.707	1.000	.776	1.000	.837	.629**	1.000

Notes: AVE = Average Variance Extracted, *highest squared correlation value, **lowest AVE value.

2.5.2.2 Structural Model

Focusing on the variance inflation factor (VIF), no evidence exists for multicollinearity between the latent variables, since the highest calculated value of 2.61 is far below the critical value of 5 (Hair et al. 2016). Testing the hypotheses requires the analysis of path estimates and their significance for all direct and indirect effects of the structural model. We first focused on the overall model, conducting the PLS procedure using 5,000 bootstrap samples. The results of the path coefficients and *t*-values for the direct and indirect effects are shown in Table 8.

Table 8 – Results of PLS-Analysis

Direct Effects	R^2	Path Coefficient (β)	*t*-Value
Effects on Purchase Channel Choice (PCC)	.51		
Frontline Employee $^{\delta}$		.013	0.357 $^{n.s}$
Mobile Device $^{\delta}$		.112	3.028 **
Online Delivery Time		.101	3.735 ***
Relative Online Price Advantage		.309	8.429 ***
Travel Time to Store		- .054	1.389 $^{n.s}$
Personal Relationship Loss Costs (PRLC)		- .234	6.885 ***
Time Loss Costs (TLC)		- .212	5.722 ***
Monetary Loss Costs (MLC)		.311	7.687 ***
Sunk Costs (SC)		.097	2.483 *
Effects on Personal Relationship Loss Costs	.08		
Frontline Employee $^{\delta}$		.281	7.018 ***
Effects on Time Loss Costs	.22		
Online Delivery Time		.464	13.537 ***
Effects on Monetary Loss Costs	.33		
Relative Online Price Advantage		.578	25.848 ***
Effects on Sunk Costs	.28		
Travel Time to Store		.532	15.905 ***

Indirect Effect	Path Coefficient (β)	*t*-Value
Frontline Employee $^{\delta}$ → PRLC → PCC	- .066	4.666 ***
Online Delivery Time → TLC → PCC	- .099	5.226 ***
Relative Online Price Advantage → MLC → PCC	.179	7.270 ***
Travel Time to Store → SC → PCC	.052	2.344 *

Notes: *** $p < .001$, ** $p < .01$, * $p < .05$, $^{n.s.}$: the relationship is not significant, δ compared to no external information.

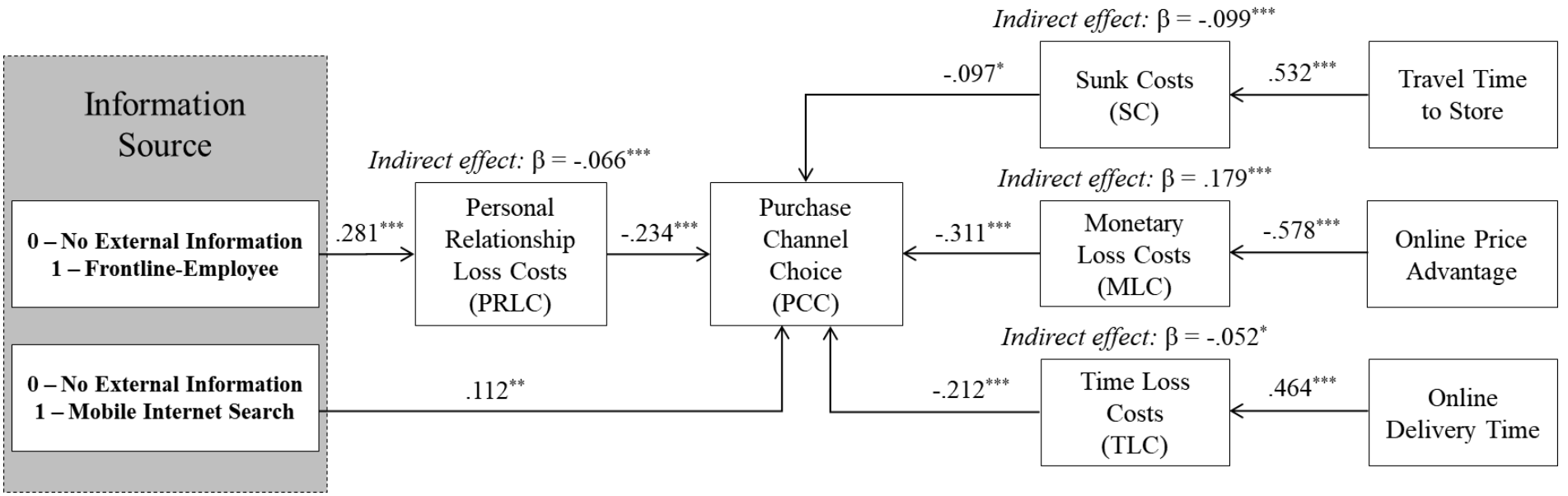
Support by a frontline employee as source of information. Regarding the information source, we found that receiving information from a frontline employee (relative to the control group) has a positive impact on personal relationship loss costs (β =.281, t = 7.018, p < .01). This means that consumers have higher personal relationship loss costs after they received personal support from a frontline employee. In contrast, no statistical difference exists between the mobile device condition and the control group on personal relationship loss costs (β = .085, t = 1.108, p = .27). Thus, we found support for H1. The personal relationship loss costs have a significant negative impact on purchase channel choice (β = -.023, t = 6.854, p = .01), which means that consumers tend to buy the product in the brick-and-mortar store instead of switching to a competitive online store due to the personal relationship loss costs.

In addition, we followed the suggestion by Hayes, Preacher, and Myers (2011) and Hair et al. (2016) to bootstrap the sampling distribution of the indirect effects and focused on the 95% confidence intervals derived from bias-corrected and accelerated bootstrapping to compare direct and indirect effects. Since the indirect effect of the relationship between a frontline employee as a source of information on purchase channel choice was significant (β = .066, CI = [.095 to .040]) and the direct effect turned out to be not statistically significant (β = .013, t = .357, p = .72), we concluded (in support of H1) that personal relationship loss costs fully mediates the relationship between a frontline employee as a source of information and purchase channel choice.

Mobile reviews as source of information. Comparing the mobile Internet search condition to the control group, the direct effect of source of information on purchase channel choice is statistically significant (β = .112, t = 3.028, p < .01). This means that the use of mobile devices at a brick-and-mortar store to search online for useful information can steer consumers toward switching to a competitive online store instead of purchasing the product in the brick-and-mortar store. Thus, H2 can be supported.

Contextual switching costs. In the context of a potential offline-to-online switch, we simultaneously tested for the direct and indirect effects of travel time spent to reach the brick-and-mortar store, online delivery time, and relative online price advantage on purchase channel choice, mediated by the related switching costs. To examine whether the contextual switching costs can explain the effects of the determinants on purchase channel choice, we started a series of analyses regarding the direct and indirect effects. First, the direct effects of online delivery time on time loss costs (β = .464, t = 13.513, p < .01), relative online price advantage on monetary loss costs (β = -.578, t = 25.848, p < .01), and travel time to store on sunk costs (β = .532, t = 15.905, p < .01) were all significant. Furthermore, we found significant effects of time loss costs on purchase channel choice (β = -.212, t = 5.722, p < .01), of monetary loss costs on purchase channel choice (β = -.311, t = 7.687, p < .01), and of sunk costs on purchase channel choice (β = -.097, t = 2.483, p < .05). We also found that the indirect effects of online delivery time (β = -.099, CI = [-.142 to -.066]), relative online price advantage (β = .179, CI = [.133 to .229]), and travel time to store (β = -.052, CI = [.013 to .100]) on purchase channel choice were significant, as none of the 95% confidence intervals include zero. As all direct and indirect effects of the determinants on purchase channel choice were significant, our results show evidence for partial mediations, and thus support for H3, H4, and H5. All path coefficients for direct and indirect effects are shown in Figure 2.

Figure 2 – Structural Model



Notes: *** $p < .001$, ** $p < .01$, * $p < .05$ - Path coefficients of the indirect effects are shown above the corresponding mediator. High value of PCC indicates a strong tendency to purchase at a competitor's online store.

2.5.2.3 Differences between Product Types

Based on the product types in the experimental design, this observable characteristic (TV set = 0 and Radio = 1) was used to separate the data into two groups. While the hypotheses were supported by the results of the full set of data, a PLS – Multi Group Analysis (PLS-MGA) was used to examine product-related differences within the model. This type of non-parametric test is a common approach to compare corresponding path coefficients. To compare the structural relationships of each subsample, PLS-MGA compares each bootstrap for both subsamples, which results in 25,000,000 bootstrap comparisons in total.

Before conducting the PLS-MGA, it is necessary to test for measurement invariance between the two separated sets of data. The measurement invariance of composite models (MICOM) procedure by Henseler, Ringle, and Sarstedt (2016) consists of three interrelated steps, where one step has to be executed after the other (Hair et al. 2017). The MICOM procedure logically starts with a qualitative assessment of configural invariance (step 1). Therefore, a critical evaluation of identical measurement, data treatment, and algorithm is needed. In this study, all participants received the same questionnaire with identical indicators and data treatment such as dummy coding of source if the information was identical as well. Furthermore, the SmartPLS 3.2.6 software automatically predefines equal algorithm settings. To ensure compositional invariance (step 2), the MICOM procedure applies a statistical test to examine whether the correlation between the composite scores of the groups is not significantly lower than 1 (Hair et al. 2017). Based on 5,000 permutations, the results demonstrate the existence of compositional invariance.

As shown in Table 9, the results of the MICOM procedure do not provide evidence for full measurement invariance, as the data indicate a significant inequality of composite means and variances for some latent variables (step 3).

Table 9 – MICOM Results Step 3

Composite	Difference of the composite's mean value (=0)	p-Value	Equal mean values?	Logarithm of the composite's variances ratio (=0)	p-Value	Equal variances ?
Purchase Channel Choice	.2468	.0056	NO	.1148	.1606	YES
Frontline employee	-.0082	.8567	YES	-.0059	.9549	YES
Monetary Loss Costs	.2898	.0012	NO	-.2063	.0212	NO
Mobile Internet Search	-.0160	.8567	YES	-.0112	.8685	YES
Online Delivery Time	-.4868	.0001	NO	-.3699	.5883	YES
Relationship Loss Costs	-.3143	.0002	NO	-.2045	.0164	NO
Online Price Advantage	.3845	.0001	NO	.1615	.4612	YES
Sunk Costs	.0764	.3856	YES	.1875	.1004	YES
Time Loss Costs	-.3434	.0001	NO	-.0555	.5953	YES
Travel Time	-.1312	.1498	YES	-.5249	.3074	YES

Table 10 – Significance Analysis of the Direct and Indirect Effects

TV Condition	**Direct Effect**	**95% Confidence Interval of the Direct Effect**	***t*-Value**	**Significance ($p < .05$)?**	**Indirect Effect**	**95% Confidence Interval of the Indirect Effect**	***t*-Value**	**Significance ($p < .05$)?**
Frontline Employee Interaction → Purchase Channel Choice	-.056	[-0.050, 0.166]	1.005	NO	-.104	[-0.163, -0.060]	3.935	YES
Mobile Device → Purchase Channel Choice	.172	[0.067, 0.281]	2.205	YES	-.020	[-0.062, 0.016]	1.040	NO
Online Delivery Time → Purchase Channel Choice	.084	[0.024, 0.167]	0.314	YES	-.081	[-0.128, -0.034]	3.229	YES
Relative Online Price Advantage → Purchase Channel Choice	.301	[0.206, 0.408]	3.133	YES	.175	[0.109, 0.246]	5.090	YES
Travel Time to the PoS → Purchase Channel Choice	-.017	[-0.125, 0.085]	5.798	NO	.058	[-0.008, 0.128]	1.674	NO †
Radio Condition	**Direct Effect**	**95% Confidence Interval of the Direct Effect**	***t*-Value**	**Significance ($p < .05$)?**	**Indirect Effect**	**95% Confidence Interval of the Indirect Effect**	***t*-Value**	**Significance ($p < .05$)?**
Frontline employee → Purchase Channel Choice	-.017	[-0.117, 0.084]	0.324	NO	-.042	[-0.085, -0.015]	2.394	YES
Mobile Device → Purchase Channel Choice	.056	[-0.043, 0.159]	3.294	NO	.003	[-0.026, 0.032]	0.180	NO
Online Delivery Time → Purchase Channel Choice	.115	[0.040, 0.178]	2.825	YES	-.121	[-0.190, -0.065]	3.606	YES
Relative Online Price Advantage → Purchase Channel Choice	.298	[0.190, 0.399]	1.081	YES	.185	[0.120, 0.259]	5.290	YES
Travel Time to the PoS → Purchase Channel Choice	-.128	[-0.217, -0.042]	5.558	YES	.066	[0.011, 0.128]	2.193	YES

Notes: † $p < .1$

However, partial measurement invariance is established for all latent variables in the structural model, which enables the comparison of path coefficients by means of a PLS-MGA (Hair et al. 2017). As PLS-MGA represents a one-tailed test, path coefficients between the groups are statistically significant (i.e., $p < .10$) if the p-value is less than .1 or greater than .9 (Hair et al. 2017). In order to compare the structural model for both product types, the bootstrap procedure was executed for each subsample separately.

Table 11 – Results of Multi Group Comparison

	Direct Effects on PCC		**Indirect Effects on PCC**	
	Δ path coefficient	*p*-Value	Δ path coefficient	*p*-Value
Frontline employee	.072	.171	.062 *	.976
Mobile Internet Search	.116 †	.063	.023	.833
Relative Online Price Advantage	.003	.488	.011	.583
Online Delivery Time	.031	.747	.040	.161
Travel Time to Store	.111 †	.063	.008	.570

Notes: * $p < .05$; † $p < .1$. (based on 25,000,000 bootstrap comparisons)

Table 12 provides the path coefficients and *t*-values of all direct effects as well as the coefficients of determination (R^2) of the inner model. As Table 11 indicates, we found no differences between the path strength of the determinants on the switching costs except for the effect of a frontline employee as the source of information on personal relationship loss costs. The analysis revealed a moderating effect, as the effect size of a frontline employee on personal relationship loss costs differs at a 10% significance level ($\Delta\beta = .136$, $p < .10$) between the products. This means that the effect of a frontline employee interaction on personal relationship loss costs is stronger for participants who were looking for a TV set compared to participants who were looking for a digital radio.

Table 12 – Results of PLS-MGA

	TV (n_1 = 272)			Radio (n_2 = 251)		
Antecedents	Path Coefficient (β)	*t*-Value	R^2	Path Coefficient (β)	*t*-Value	R^2
Frontline Employee → Personal Relationship Loss Costs	.363 ***	5.824	.11	.227 ***	3.345	.06
Mobile Internet Search → Personal Relationship Loss Costs	.072 **n.s.**	1.060		- .014 **n.s.**	.186	
Online Delivery Time → Time Loss Costs	.443 ***	10.093	.20	.450 ***	6.616	.20
Relative Online Price Advantage → Monetary Loss Costs	- .558 ***	17.184	.31	- .582 ***	16.700	.34
Travel Time to Store → Sunk Costs	.535 ***	12.951	.29	.559 ***	11.598	.31
Direct determinants						
Frontline employee → Purchase Channel Choice	.056 **n.s.**	1.005	.49	- .017 **n.s.**	.324	.54
Mobile Internet Search → Purchase Channel Choice	.172 **	3.133		.056 n.s.	1.081	
Online Delivery Time → Purchase Channel Choice	.084 *	2.205		.115 ***	3.294	
Relative Online Price Advantage → Purchase Channel Choice	.301 ***	5.798		.298 ***	5.558	
Travel Time to Store → Purchase Channel Choice	- .017 **n.s.**	.314		- .128 **	2.825	
Consequences						
Personal Relationship Loss Costs → Purchase Channel Choice	- .286 ***	5.600		- .186 ***	4.044	
Time Loss Costs → Purchase Channel Choice	- .183 **	3.571		- .269 ***	4.919	
Monetary Loss Costs → Purchase Channel Choice	- .313 ***	5.386		- .319 ***	5.749	
Sunk Costs → Purchase Channel Choice	.108 †	1.770		.118 *	2.336	

Notes: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .1$; n.s.: the relationship is not significant. (based on 5000 bootstraps)

However, the direct effect of a frontline employee on personal relationship loss costs is still highly significant for both TV ($\beta = .363$, $t = 5.824$, $p < .01$) and radio condition ($\beta = .227$, $t = 3.345$, $p < .01$). In addition, a moderated mediation by the product category was found, since the indirect effect of a frontline employee on purchase channel choice is even stronger in the TV set subsample ($\Delta\beta = .062$, $p < .05$). Focusing on consumers' purchase channel choice, we also found differences in the direct and indirect effects of the determinants on purchase channel choice between the subsamples. In line with the group comparison (see Table 10), a significant difference was found between the two subsamples for the effect of mobile search as the source of information on purchase channel choice ($\Delta\beta = .116$, $p < .10$), which means that mobile Internet search only has a direct effect on purchase channel choice in the TV set condition ($\beta = .172$, $t = 3.133$, $p < .01$). For consumers who were looking for digital radios, the effect was not statistically significant ($\beta = .056$, $t = 1.081$, $p = .28$). In contrast, travel time to store seems to be more important for participants in the radio group, since this effect is significantly stronger for participants in this product condition ($\Delta\beta = .111$, $p < .10$).

We assumed that the identified group differences resulted from different product prices within the two selected categories. Consumers who are looking for costly products like a TV set seem to focus more on product-relevant information, requiring a more comprehensive interaction with the frontline employee or a more comprehensive mobile Internet search. Conversely, consumers who are looking for lower-priced products such as radios might focus more on costs incurred, such as the time invested to travel to the store.

2.6 General Discussion

2.6.1 Conclusion

The primary purpose of this study was to investigate the effect of the information channel used on purchase channel choices, by examining two major sources of information typically available at a brick-and-mortar store. The results show that the information channel can steer consumers to purchase in the same channel. Consumers who interact with a frontline employee prefer to purchase offline, and a mobile Internet search has a positive effect on switching to a competitor's online channel. Therefore the results show support for the channel lock-in effect (Verhoef, Neslin, and Vroomen 2007).

In the context of consumers' multichannel buying behavior, this study contributes to research on both the impact of consumers' mobile device usage at the point of sale and research about frontline employees as a fundamental resource for retailers to interact with their consumers. While the focus of existing literature has mostly been on mobile price comparisons as a potential risk for retailers, this study provides evidence for the impact of purchase-related mobile device usage in the buying process.

Furthermore, we demonstrated direct and indirect effects of additional identified determinants, such as online price advantage, travel time to the store and delivery time, simultaneously to the effect of information source on the purchase channel choice. The concept of switching costs was found to be an appropriate approach for explaining consumers' purchase channel choice in an ongoing buying process. In the literature on switching costs, personal relationship loss costs have mostly been defined as mental costs incurred by a long-term relationship. However, our results demonstrate that a first-time interaction with a frontline employee can create these costs, and therefore explain consumers' preference to purchase at the brick-and-mortar store.

2.6.2 Managerial Implications

Based on the results of this study, some managerial implications can help retailers to prevent consumers switching to a competitor's online store. The impact of purchase channel choice on customer value demonstrates the important role of the information channel for retailers. In order to show pertinent key figures, the multiplied average willingness to pay by the frequencies of chosen purchase channel provides an appropriate factor to compare customer value, while making a distinction between different sources of information (see Table 13). The collected data for the product segment of flat-screen televisions revealed a willingness to pay an average of € 875 per customer. With regard to purchase channel choice frequencies (see Table 13), an average customer value of € 644 was calculated for consumers who are already in the store and do not receive any information from external sources. Through the support of a frontline employee, retailers can increase this value to € 698. In contrast, mobile Internet search for external information decreases the average customer value to €515.

Table 13 – Purchase Channel Choice Frequencies

		Visited Brick-and-Mortar Store		*Competitor's Online Store*	
		Radio	*TV*	*Radio*	*TV*
Information Channel	No external Information	61.5 %	73.6 %	38.5 %	26.4 %
	Frontline Employee	69.1 %	79.8 %	30.9 %	20.2 %
	Mobile Internet Search	53.2 %	58.2 %	46.8 %	41.8 %

Following our results, retailers should offer personal support to increase consumers' relationship loss costs. Frontline employees should anticipate consumers' searching on their mobile devices and provide proactive consumer advice. Thereby retailers can actively ensure personal interaction, with the intention that consumers stay and purchase in the store instead of switching to an online competitor.

Finally, retailers should focus on consumers' purchase channel characteristics. In this context, relative price advantages of online stores were found to have a strong impact on

consumers' purchase channel switching behavior. Therefore, retailers should always compare prices to online stores in order to prevent significant price differences. In addition, retailers should strongly communicate offline channel advantages such as customer service, and online disadvantages such as longer delivery times.

2.6.3 Research Implications and Limitations

In addition to practical implications, this study has several limitations and opens various avenues for further research. Future research should extend our findings with explanations for the effects of the information channel on purchase channel switching intentions, and on choosing a different channel to purchase. For instance, a consumer may consult with a frontline employee as well as perform a mobile Internet search during a shop visit. Another example is the consumers' desire to conduct an Internet search at home prior to purchasing. While the focus of this study is on each information channel separately, the knowledge about the effect of multiple information channel searches on purchase channel choice is limited. Thus, examining the effects of a multichannel information search at the point of sale on consumers' purchase channel switching intentions is an interesting field for further research. As consumers are not limited to a single source of information, it requires a complex study design to examine this impact on the consumer purchase decision process.

One issue of this study is the difference between the information channels that are linked to the source of information. The question arises as to whether the information channel (mobile device versus personal interaction) affects the consumers' information processing, as computer-mediated communication results in impersonal information reception (Ramirez et al. 2002). However, this was outside the scope of this study. Future research should therefore consider the impact of different information channels and information sources on consumers' purchase behavior.

Another limitation of this investigation is the decentralization of the field study and, as a result, the loss of control. In order to create realistic buying process conditions, retailers were not asked to collaborate in this study. Since participants' store visits should not overlap, and frontline employees should not be confused by the number of consumers asking for similar products, it was necessary to ensure that participants were distributed among many retailers. However, this study may provide an example of how to create a research design to separate the different information sources (in a field study setting) and to investigate those effects on the purchase decision process. Even if the study design does not cover actual purchase decisions, the mystery shopping scenario offers a good opportunity to conduct a field experiment with complex and almost uncontrollable manipulations in a real setting.

Although we tested the developed model for two different product price categories, the products may differ by other characteristics, such as search versus experience products, hedonic versus utilitarian, complexity, or purchase risk. For example, consumers may intend to buy bulky electronic products such as a TV set in stores rather than online. In this context, previous literature has already focused on product categories' impact on purchase channel preference (Chiang and Dholakia 2003). However, further research should address this issue by testing the provided model of purchase channel choice for a variety of different product categories. Thus, it seems important to examine whether some retailers would be impaired by consumers' mobile Internet search but not others.

3 Essay II – In-Store Information Search in a Digital World: The Effect of Perceived Collaborative Decision-Making on Customers' Choice Confidence

3.1 Abstract

When faced with a vast number of different product alternatives in-store, consumers may experience choice overload, which makes it difficult for them to come to confident purchase decisions. To reduce choice overload and simplify the purchase decision process, customers frequently decide to use external information sources like the Internet via smartphone while in a store. Using a mixed-methods approach, this research compares two commonly used information sources at the point of sale, namely consumers' interaction with a frontline employee and online product reviews via smartphone. First, a qualitative exploration offers insights into different strategies customers employ to reduce choice overload by using these two sources of external information. The results suggest that frontline employee interaction leads to collaborative decision-making, whereas purchase decisions based on online product reviews are perceived to be less collaborative. Based on the qualitative research findings, a conceptual model is developed and empirically tested using a large-scale field experiment. The results confirm the expectation that interaction with a frontline employee leads to more collaborative/less independent decision-making than using online product reviews, which consequently reduces choice overload and enhances choice confidence. Based on these findings, we provide implications for retailers as well as contributions to research on retail frontline management.

Keywords: *frontline employee interaction; online product reviews; in-store information search; choice confidence; choice overload; collaborative decision-making*

Additional Note:

A prior version of this paper, co-authored by Gerrit Cziehso (TU Dortmund University), Tobias Schäfers (TU Dortmund University), and Monika Kukar-Kinney (University of Richmond); Kessenbrock, A., Cziehso, G., Schäfers T., Kukar-Kinney, M.: "Frontline Employee Interaction or Online Product Reviews? How Customers' In-Store Information Search Influences Collaborative Decision-making and Choice Confidence", has been presented and discussed at the Academy of Marketing Science (AMS) Annual Conference in New Orleans (2018) and the Global Marketing Conference (GMC) in Tokyo (2018).

3.2 Introduction

Customers are faced with extensive product assortments, both online and at the point-of-sale (PoS) (Scheibehenne, Greifeneder, and Todd 2010). This variety makes it difficult for customers to decide for a specific product during the purchase process, a phenomenon known as choice overload (Iyengar and Lepper 2000). Scholarly literature shows that choice overload leads to uncertainty (Chernev, Böckenholt, and Goodman 2015; Kuksov and Villas-Boas 2010), a decrease in motivation to make a choice (e.g., Iyengar and Lepper 2000), lower satisfaction with the chosen option (e.g., Chernev 2003; Iyengar and Lepper 2000), and negative emotions (e.g., Schwartz 2000). While online retailers can facilitate choice by offering a multitude of filter functions (e.g., sorting products by price or product characteristics), product recommendations, and product reviews on their websites, bricks-and-mortar retailers have to rely on their frontline employees to address or minimize choice overload and to assist customers during the decision-making process.

Searching for information can increase customers' confidence in making a purchase decision (Park and Lessig 1981). At the same time, digital technologies now provide customers with a way of gathering product information from external sources, such as online product reviews, while being at the PoS (Lu 2017). Bricks-and-mortar retailers even encourage or support customers' use of such external information by providing free WiFi in-store (Vella 2012). Thus, additional information gathered via online channels has become an integral part of customers' purchase decision processes. In some cases, it may even replace frontline employees as an information source (Singh and Swait 2017). As a consequence, some retailers have been reducing the number of frontline employees or creating new bricks-and-mortar store formats, in which customers gather relevant information on their own. For example, the online retailer Amazon has recently opened bricks-and-mortar stores which utilize a minimal number of employees in order to "provide a personalized, human experience without the human"

(Goodmanson 2018). Harrison and O`Neill (2017) refer to an unnamed retailer that "figured out how the company could operate with one-third fewer employees in its stores". In this context, digitalization creates a variety of new challenges for retailers and frontline employees with regards to promoting in-store sales or providing expedient customer service at the PoS (Rapp et al. 2015), leaving companies unsure about what the new role of frontline employees will be in the future of retailing (Grewal, Roggeveen, and Nordfält 2017).

In a typical in-store purchase decision, customers most frequently use two information sources: frontline employees and online product reviews written by other customers (Rippé et al. 2017). On the one side, research has examined the impact of customer-frontline employee interactions, demonstrating that frontline employees can influence customers' preferences (Sharma 2001), and that their credibility (Weitz 1978), expertise, and similarity (Woodside and Davenport 1974) may influence customers' purchase behavior. On the other side, scholarly literature has investigated the effects of online product reviews on customers' purchase decisions (see Darley, Blankson, and Luethge 2010 for a review), revealing that online product choice is strongly influenced by online customer reviews (Lee, Park, and Han 2011) and recommendations (Senecal and Nantel 2004). However, these two research streams on different external information sources (i.e., frontline employees and online product reviews) have been primarily considered in isolation from each other. The research by Rippé et al. (2017) is an exception and bridges the gap between these two information sources at the PoS by examining how frontline employees interact with customers who are using mobile devices in-store searching for additional information. Nevertheless, possible differences in the influence of frontline employees versus online product reviews on customers' in-store decision-making have not been sufficiently investigated. Therefore, this research examines the effect of frontline employee interaction and mobile search for online product reviews on customers' purchase decisions.

In order to understand how customers deal with choice overload and the two important information sources at the PoS, we rely on the information processing framework of human problem solving (Simon 2014). This theoretical framework provides a suitable approach to explain how individuals (customers) can solve a structured problem (purchase decision under choice overload) in a given environment (available information source). By applying this theoretical base, our investigation also provides a theoretical contribution, as it increases knowledge about how different information sources drive customers to employ different information processing strategies.

A mixed-methods approach is used to address the research question. First, a qualitative exploration is undertaken to identify differences in information processing across the two information sources of interest: frontline employees versus online product reviews. The exploratory study results suggest that the interaction-oriented communication between customers and frontline employees results in collaborative decision-making in which the customer and the employee jointly solve the problem of product choice, leading to higher choice confidence. In contrast, for in-store mobile search of online product reviews, the perception of joint decision-making appears to be substantially less pronounced and choice confidence appears to be lower as well, likely because no interaction between the customer reading the product review and the person who wrote it takes place.

Based on these exploratory findings, we develop a conceptual model and a series of hypotheses which are then empirically tested in a large scale, quantitative field experiment. The results confirm that, compared to reading online product reviews, interaction with frontline employees trigger collaborative decision-making, which reduces customers' feeling of choice overload in-store, thereby increasing their choice confidence during the purchase decision process. We demonstrate the robustness of these findings by accounting for several control variables and by obtaining consistent results across two different product categories.

With these results, we contribute to the debate on the future of retailing (Grewal, Roggeveen, and Nordfält 2017) and the field of frontline employee management (Singh et al. 2017). Our research also sheds light on customers' reactions to different information sources, thereby contributing to the research streams on choice overload, frontline employee interaction, and mobile in-store information search. Additionally, our findings provide a variety of managerial implications for bricks-and-mortar and online retailers.

3.2.1 External Information Processing of Different Sources

Consumers' external information search is a perennial issue for understanding customers' path to purchase (Schmidt and Spreng 1996). Thus, numerous studies have investigated the influence of motivational and economic antecedents (e.g., customers' product knowledge, perceived risk, product complexity, and perceived search costs) on customers' choice of information source (e.g., Ratchford, Talukdar, and Lee 2001; Schoenbachler and Gordon 2002). In contrast, research on the impact of the information source on customers' decision-making processes is rather scarce (Rippé et al. 2017).

According to Beatty and Smith (1987), information sources can be classified into four categories: interpersonal search (e.g., consultation with family or friends), media search (e.g., advertising and promotion), neutral sources search (e.g., consumer reports and news article), and retailer search (e.g., consultation with frontline employees). Based on customers' desire to use multiple information sources to make a good purchase decision, Jang, Prasad, and Ratchford (2017) distinguish two main sources, namely, online and offline information. With respect to comparing different sources of information, Lee, Park, and Han (2008) point out that "online consumer reviews offer more consumer-oriented information, whereas sellers offer more product-oriented information, such as product attributes, technical specifications, and performance results in relation to technical standards." (p. 342). Following this rationale, different information sources may provide different types of information. Moreover, different

information sources may also encourage different information processing strategies. For example, the number of online product reviews (Park and Kim 2008) and the information quality (Chen, Dhanasobhon, and Smith 2008) influence information processing. Further, a personal interaction with a salesperson impacts cognitive information processing, since customers focus less on product information (Babin, Boles, and Darden 1995), and more on the perception of the salesperson. The perception of the information source in the decision-making process is largely based on trust and expertise (e.g., Doney and Cannon 1997; Kim, Ferrin, and Rao 2008; Woodside and Davenport 1974).

The perception of the information source is of major importance in our study because of the intensive interaction between frontline employees and customers (Williams and Spiro 1985). A high level of interaction between the two actors typically leads to an increasing number of sales (Chapple and Donald 1947). With the increasing availability of large amounts of information for customers, choice overload has become an issue when customers are trying to process product information in order to make a purchase decision. Thus, the influence of personal interaction on problem-solving strategies for choice overload is becoming increasingly important; however, research on this topic remains sparse. Since the choice overload, and consequently, choice confidence depends on various factors, previous research on this topic is discussed next.

3.2.2 Choice Confidence and Choice Overload

An essential assumption of the information processing framework is that consumers use information search to decrease uncertainty and increase choice confidence for the individual task (Galbraith 1974). Following Sniezek (1992), we use both “certainty” and “confidence” to denote the same construct. Choice confidence can be seen as the “self-rated confidence in the correctness of the decision” (Taylor 1975, p. 77) or “confidence in performing a specific task or in solving a specific problem” (Cox and Bauer 1964, p. 454-455).

The perception of uncertainty can occur in situations in which no internal information, such as personal product experience, is available to the consumer. To solve the problem of feeling uncertain about product choice, customers tend to seek external information when faced with choice overload (Berger and Calabrese 1975). Therefore, uncertainty is a driver of customers' external information search. The greater the perception of uncertainty, the more extensively do customers gather external information (Lee and Jin Ma 2012). As the quality and quantity of information increases, customers' confidence increases (e.g., Homburg, Koschate, and Hoyer 2006). In the context of online information search, online product reviews can help customers to decrease uncertainty (e.g., Hogg 2000). However, online product reviews can also increase uncertainty if they contribute to information overload or when the obtained information is inconsistent (e.g., Park and Lee 2008; Yao et al. 2009).

The problem of having too many choice alternatives is one of the strongest drivers of choice uncertainty (Haynes 2009). This phenomenon of the negative consequences of having too many alternatives is called "choice overload" (Iyengar and Lepper 2000) or "overchoice effect" (Gourville and Soman 2005). When faced with negative emotions, such as choice uncertainty, customers may refrain from making a choice and may abandon a planned purchase (Iyengar and Lepper 2000). Thus, exploring ways to reduce choice overload is a managerially relevant question for bricks-and-mortar and online retailers alike.

3.3 Qualitative Study: Identification of Different Information Processing Strategies

Because prior research has not sufficiently addressed differences between frontline employees and online product reviews regarding customers' decision-making at the PoS, we employed an exploratory sequential mixed-methods design (Creswell 2014). In this design, a qualitative research phase is used to explore a phenomenon and derive hypotheses through combination with existing literature, followed by a quantitative phase of hypotheses testing. To investigate the effects of different external information sources on customers' in-store decision-making, we focused on the following questions:

(1) When faced with an in-store purchase decision, how do customers perceive the information obtained from different information sources (i.e., a frontline employee versus online product reviews)?

(2) Does the use of these different information sources lead to differences in the cognitive information processing strategies consumers utilize to increase choice confidence under conditions of choice overload?

3.3.1 Procedure and Data Collection[2]

In order to obtain insights about the effects of information source (i.e., a frontline employee versus online product reviews) on customers' choice confidence and product choice, we incorporated an actual shopping experience into the research design. Specifically, we invited undergraduate students at a German university to participate in a mystery shopping exercise in return for extra class credit. A total number of 350 students (M_{age} = 20.68 years, 43.1% female)

[2] The described procedure of the data collection is similar to that in Essay I, since the data of the qualitative exploration of this paper were jointly collected with the conducted field study in Essay I. However, none of the used data in this paper were used in Essay I. Participants from the control groups were excluded.

participated in the study. Each student received a personalized email with instructions to visit a consumer electronics store, search for a specific product and write a brief report about the shopping experience. To avoid overcrowding and ensure a realistic shopping experience, participants were sent to different stores over the course of several days. Unbeknownst to participants, they randomly received one of two different task instructions. In the first group, participants were asked to consult a frontline employee for product information to be able to decide on a product; in the second group, students were told to use their mobile phone in the store to search for online product reviews to help with their product choice. We used these different instructions to ensure sufficient incidence of the participants' use of both information sources. Immediately after the store visit, participants filled out an online survey that contained several open-ended questions. Specifically, participants were asked to describe in their own words how the information source assisted them in their product choice and affected their choice confidence.

To analyze the accumulated text data, we followed a three-step process as proposed by Wolcott (1994). In the first step, themed as description, we employed iterative descriptive coding (Miles, Huberman, and Saldana 2013) for categorizing content. Second, the analysis step was used to systematically identify overarching themes and relationships in the data. Both of these steps were conducted independently by two of the authors to ensure validity. In a third step, the interpretation, all the authors jointly made sense of the findings by linking them to existing literature (Wolcott 1994).

3.3.2 Results

In total, 350 text units (175 for each information source) were obtained and analyzed. Overall, we identified three main response categories, specifically, those pertaining to 1) information characteristics, 2) source characteristics, and 3) collaborative decision-making. For the first two, differences between participants interacting with a frontline employee and those

conducting online mobile search and reading online product reviews were apparent. For example, as evidenced in prior studies (e.g., Duan, Gu, and Whinston 2008; Mudambi and Schuff 2010; Schlosser 2011), participants who used online product reviews exhibited a focus on information characteristics, such as information valence, information consistency, information quantity, and information structure. In contrast, respondents who interacted with a frontline employee described their shopping experience with a stronger focus on source-related information, such as source expertise, credibility, and persuasiveness, which is also in line with prior findings (e.g., Belonax Jr, Newell, and Plank 2007; Williams and Spiro 1985). Table 14 provides the absolute frequencies of information characteristics and source characteristics that were mentioned in the analyzed text units.

Table 14 – Frequencies of Information- and Source Characteristics

Frequency*		(Sub-)Category	Definition
22	76	*Information Valence*	Information Valence refers to the identification of positive and negative product evaluations.
-	62	*Information Consistency*	Information Consistency addresses issues of consumers' uncertainty by inconsistent product evaluations.
11	47	*Information Quantity*	Information Quantity refers to the extent of provided product information.
-	99	*Information Structure*	Information Structure refers to the way information are provided, e.g., overview of consumer ratings.
87	10	*Source Expertise*	Source Expertise refers to the attributed expertise of the source of information.
33	26	*Source Credibility*	Source Credibility refers to the adjudged credibility of the source of information.
29	-	*Source Persuasion*	Source Kindness refers to the attributed kindness of the source of information.

Notes: * 1st Colum = Frontline Employee Interaction Condition; 2nd Colum = Online Mobile Search Condition.

Additionally, the qualitative data analysis revealed fundamental differences in customers' strategies to reduce choice overload and make a purchase decision. Respondents who used online product reviews described the process of making a purchase decision as something they did on their own, while participants who consulted a frontline employee predominantly

described the decision-making as a collaborative process. This yet unexplored phenomenon of collaborative decision-making as a strategy to reduce choice overload in the context of in-store purchase decisions became the focus of our exploratory analysis. Table 1 provides an overview of the results regarding collaborative decision-making and choice overload.

Table 15 – Drivers of Choice Confidence, Definitions, and Representative Quotes

Collaborative Decision-Making		Perceived collaboration with the source of information while making a purchase decision.
	Frontline Employee Interaction	*"In the end, we evaluated all eligible products that fit my needs and jointly decided for a TV set with ultra-high definition."* [male, 22] *"After looking at several devices, we agreed on one […]"* [female, 21]
	Online Product Reviews	*„Since all of my questions relating to the product and its quality had been fully answered by the reviews, I had all information to make my final decision."* [male, 21] *"Looking back, the online product reviews helped me, since they supported my decision for this alternative […]."* [female, 22]
Choice Overload		Negative perception of having too many choice alternatives.
	Frontline Employee Interaction	*"With such a large selection in the store, it helped a lot that the salesperson focused on just a few products which were good according to his recommendation."* [female, 19] *"After I specified my needs, the salesperson showed me only three products. […]. I understood so much better what the advantages of each product were and what I should pay attention to."* [female, 18]
	Online Product Reviews	*"It is very annoying to search through the many different product alternatives and often you end up with a wrong product […]."* [male, 20] *"Since there were various different opinions about every product, it took quite a long time to read several product reviews und find the product that best suited my personal preferences."* [female, 24]

3.3.2.1 Collaborative Decision-Making

A common theme among the participants who interacted with frontline employees was the joint nature of decision-making. For example, respondents described that they made their decision for a product in cooperation with the frontline employee.

> "Without the collaboration, I would not have discovered this device." *(male, 19)*

Throughout, participants frequently used pronouns, such as "we", "us", and "our", when describing their purchase decision process. Such usage indicates the perception that both the customer and the frontline employee contributed to the product choice.

> *"After looking at several devices, we agreed on one." (female, 21)*

Some participants clearly pointed out that the final product choice was made together with the frontline employee…

> *"In the end, we evaluated all eligible products that fit my needs and jointly decided on [a product]." (male, 22)*

… based on their needs and expectations.

> *"The saleswoman analyzed my needs and proposed a suitable option as needed." (male, 22)*

In contrast, customers who used online product reviews as a source of information rarely referred to the individuals who wrote the reviews and did not provide any indications of collaborative decision-making. In the descriptions, pronouns such as "I", "me", and "my", which reflect individualist thinking, were common.

> *"I had all information to come to my final decision." (male, 21)*

Although participants used the information in the reviews …

"All of my questions relating to the product and its quality had been fully answered by the reviewers" (male, 21),

… they appeared to have the feeling of making the decision on their own. Furthermore, several participants stated that product reviews were not used to make a preselection of alternatives, but rather to provide support for a decision that had already been made.

"My first impression of my favorites was strengthened by reading the product reviews." (female, 20)

"Looking back, the online product reviews helped me, since they supported my decision for this alternative […]" (female, 22)

3.3.2.2 Choice Overload

Across the two information source groups, respondents repeatedly referred to perceptions of choice overload. At the same time, interesting differences emerged. The results show that frontline employees address this problem by tailoring information to customers' individual needs and expectations.

"After I specified my needs, the salesperson showed me only three devices. […]", female, 18)

Frontline employees are not only part of the preselection process to find the best product, but they may also dominate the preselection to dissolve choice overload and contribute to choice confidence.

"With such a huge assortment in the store, it helped a lot that the salesperson focused on just a few devices which were good according to his recommendation.", female, 19)

In contrast, respondents who used online product reviews tried to address choice overload by structuring information, such as using average ratings or selection filters to make the product

search and information selection easier. However, participants had to do this preselection process on their own.

> *"Since there were various different opinions to every product, it was quite lengthy to read several product reviews and to find the product which best suited my personal preferences.", female, 24)*

Some had also difficulties finding the right product because of confusing product names and article numbers while searching for product reviews.

> *"It is very annoying to search through the many different product designations and often you end up with a wrong device […].", male, 20)*

In sum, the results indicate that consulting a frontline employee can dissolve choice overload more efficiently than online product reviews.

3.3.3 Discussion and Development of Hypotheses

As suggested by Wind (2011) and Moriarty and Bateson (1982), it is important to determine whether a collaboration can be seen as a decision by two or more people or by an individual person with input from others. The difference is fundamental because "the final judgments or choices of groups can differ substantially from those that are made by comparable or the same persons working independently." (Sniezek 1992, p. 125). Choices jointly made by groups are also known as collaborative or interactive decision-making (Heath and Gonzalez 1995). In this context, Hiltz, Johnson, and Turoff (1986) found that personal interactions shift participants' attention on the communication process itself, which should lead to higher collaboration opportunities between the dialog partners, whereas computer-mediated communication is more task-oriented.

In this manner, the results of the qualitative study indicate that the interaction with frontline employees during the purchase decision process is perceived as a collaborative

process, while customers confronted with information in the form of online product reviews perceive that they have to make the decision on their own.

Hypothesis 1: *When information search at the point of sale is based on frontline employee interactions, it leads to greater collaborative decision-making than information search based on online product reviews.*

Participants pointed out that the preselection and even the final product choice itself was oftentimes made together with the frontline employee, which helped them handle product choice overload. Spekman and Stern (1979) show that individuals tend to resort to joint decision-making when uncertainty in the purchase decision-making process is high, suggesting that customers use collaboration with others to reduce their uncertainty during the purchase decision. This is in line with our exploratory finding that in-store collaborative decision-making during frontline employee interaction decreases choice overload, which allows for easier decision-making.

Although scholarly literature has demonstrated a decreasing effect of product reviews on choice overload, this effect was limited to the context of online shopping experience (Häubl and Trifts 2000), and weak for mobile in-store information search (Daurer et al. 2016). In contrast, Scheibehenne, Greifeneder, and Todd (2010) mentioned that product reviews can even increase the feeling of choice overload due to a high quantity of information. They argue that "if this set of high quality recommendations becomes too large, it can move people from a situation of information overload into a situation of choice overload." (p. 63).

Based on the above literature and the qualitative results, we propose that consumers' perceived choice overload is lower when interacting with frontline employees compared to when searching for and reading online product reviews.

Hypothesis 2: *When information search at the point of sale is based on frontline employee interactions, it leads to lower choice overload than information search based on online product reviews.*

Sniezek (1992) emphasized that confidence in a decision of an individual group member is affected by other parties of the group. If it is assumed that one of the group members possesses a great deal of expertise—such as a frontline employee—and assists in the decision-making process, customers should feel more confident about their decision. A similar explanation can be given by the risky-shift phenomenon (Forsyth 1990), which assumes that groups are more likely to make venturesome decisions than individuals because of less personal responsibility and higher confidence in the outcome of such a decision within the group setting. However, as gathering information from online product reviews at the PoS is not perceived as a collaborative decision-making process, it should, in turn, result in greater personal responsibility for the decision and lower confidence in the product choice.

Hypothesis 3: *When information search at the point of sale is based on frontline employee interactions, it leads to higher choice confidence than information search based on online product reviews.*

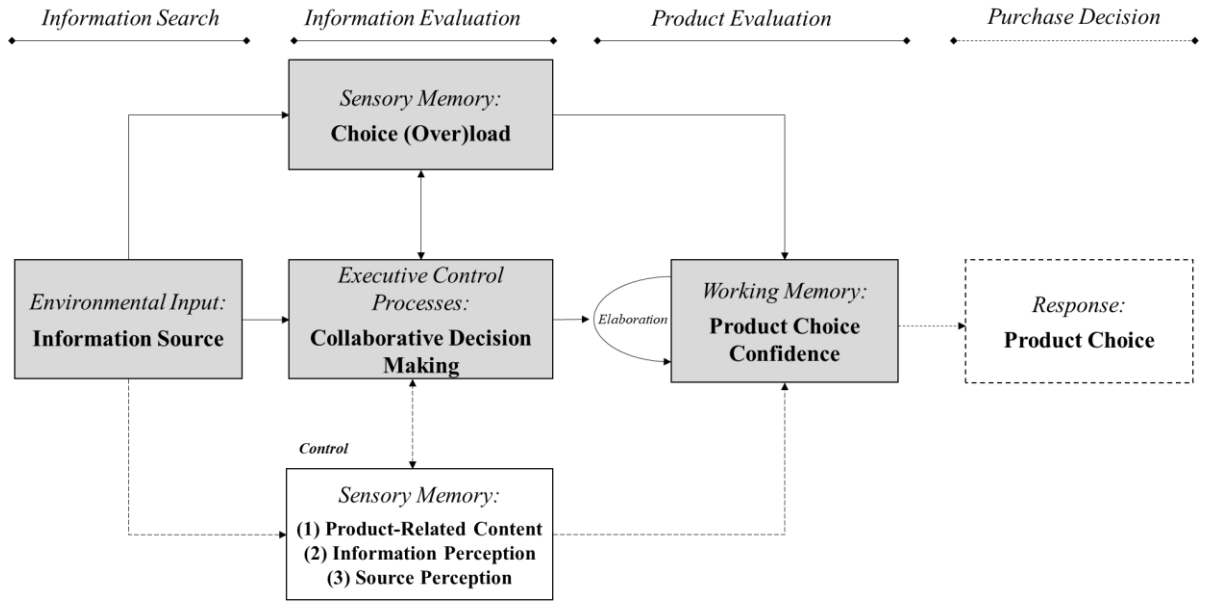
Scholarly literature has shown that choice confidence is affected by choice overload (e.g., Chernev 2003; Chernev, Böckenholt, and Goodman 2015; Iyengar and Lepper 2000; Kuksov and Villas-Boas 2010). We therefore expect that lower choice overload due to collaborative decision-making with a frontline employee results in higher choice confidence. Formally, we thus predict the following mediation:

Hypothesis 4: *The positive effect of frontline employee interactions (versus online product reviews) on choice confidence is serially mediated by perceptions of collaborative decision-making and choice overload.*

3.3.3.1 Conceptual Framework

On the basis of the information-processing model, the findings of the qualitative data analysis result in a conceptual framework, which is embedded in the purchase decision-making process (see Figure 3). The information source represents the initial position of the framework and is the driver of both the sensory memory and the cognitive process of executive control over the information processes (Im Craik and Lockhart 1972). In the context of the decision-making process, sensory memory comprises the short-term storage of impressions such as choice load, product-related content, information perception and source perception, which result from the information exchange. The executive control process is a mechanism that covers the strategies necessary to process multiple tasks using the working memory (Kieras and Meyer 1994). In this sense, we identified collaborative decision-making as a potential strategy by customers to increase choice confidence. Finally, working memory is essential for justification of (purchase) decision-making (Baddeley 1992).

Figure 3 – Conceptual Framework of Information Processing



Notes: Fields with a grey background highlight the major constructs of the following investigation and solid lines highlight the assumed relationships. The constructs with a dotted outline are not part of the following investigation and only mentioned here for the sake of completeness.

3.4 Quantitative Study: Collaborative Decision-Making, Choice Overload and Its Mediating Role on Product Choice Confidence

3.4.1 Procedure, Sample Characteristics and Measures

3.4.1.1 Procedure and Sample Characteristics

In order to test the proposed hypotheses, we conducted a between-subjects field experiment. The procedure was similar to the mystery shopping assignment in the exploratory study, except for the addition of a control condition in which participants were instructed not to gather any external information. Furthermore, participants were instructed to obtain information for products in a specific product category. In order to assess the generalizability of findings, two different product categories (a smart TV set and a washing machine) were used.

In total, 585 undergraduate students (M_{age} = 20.65 years, 41.2% female) completed a pre-task questionnaire, a store visit, and a follow-up questionnaire for extra class credit. After participants completed the pre-task questionnaire about their general purchase behavior, smartphone ownership, availability of mobile web on their smartphone, and demographics, they were randomly assigned to one of six experimental conditions (i.e., type of information search: frontline employee interaction, mobile search of online product reviews, or control group; product category: smart TV set or washing machine). Following the instructions to visit a local consumer electronics store in their hometown and select a product of their choice (either a TV set or a washing machine), the participants visited 45 different stores. They spent on average 34.37 minutes (SD = 17.20) in the store and 24.73 minutes (SD = 82.73) to get there.

3.4.1.2 Measures

All participants were instructed to respond to a post-task questionnaire no later than two hours after completing the store visit. To assist the participants with remembering the shopping situation, the survey began with open questions about their shopping experience. Choice

confidence was measured with three items, adapted from Urbany et al. (1997). Collaborative decision-making was measured by a three-item scale from Botti and McGill (2006). Moreover, we adopted the four-item scale of choice overload from Johnson et al. (2012), originally adapted from Sproles and Sproles (1990). All items were measured with a 7-point agree/disagree scale and are shown in Table 16. In addition, we used single items to measure information and source perceptions as control variables. Appendix A provides details on the control items as well as variable correlations.

3.4.2 Data Analysis and Results

Psychometric properties of the measurement scales, including reliability as well as convergent and discriminant validity, were evaluated first, using confirmatory factor analysis. Then, we assessed the effects of the two information sources in contrast to no external information access. Specifically, we tested the postulated positive effect of frontline employee interaction (versus online product reviews) on collaborative decision-making (Hypothesis 1), choice overload (Hypothesis 2), and choice confidence (Hypothesis 3).

In order to compare frontline employee interaction and online product reviews as information sources and test for the hypothesized serial mediation of collaborative decision-making and choice overload (Hypothesis 4), we estimated the mediation model using partial least squares (PLS) path modeling with SmartPLS 3.2.6 software, a multivariate analysis technique for testing structural models (Barroso and Picón 2012; Ringle, Wende, and Becker 2015). PLS permits the use of nominal data (i.e., information source), is more appropriate for models that contain complex relationships, and finally is a non-parametric technique that allows us to utilize non-normally distributed data (Chin 1998).

Finally, to ensure validity and generalizability of the results, we contrasted the two different product categories and controlled for a variety of previously identified covariates.

3.4.2.1 Data Quality Assessment

As illustrated in Table 2, the employed scales exhibit acceptable psychometric properties, with indicator reliabilities above .40, except for the first item measuring product choice and the fourth item measuring choice overload. However, following recommendations by Netemeyer, Bearden, and Sharma (2003), we retained both items as their face validity was judged to be sufficient. Moreover, the resulting construct reliability above .73 and average variance extracted close to or above the .50 criterion supported the employed measures. Furthermore, discriminant validity was confirmed, as each scale's average variance extracted exceeded the squared multiple correlations (Fornell and Larcker 1981).

Table 16 - Items, Reliability Measures, and Descriptives

	Cronbach's alpha	**Construct reliability**	**AVE**	**Factor loadings**	**Indicator reliability**	**Mean (*SD*)**
Product Choice Confidence (Urbany et al. 1997)	.675	.733	.489			
1. It was impossible to be confident about which product fit my preferences best. (r)				.483	.233	5.335 *(1.420)*
2. I felt confident identifying the product that best matched my preferences.				.725	.525	5.880 *(.893)*
3. I was convinced I found a product that best fulfilled my needs.				.842	.709	5.332 *(1.306)*
Choice Overload (Sproles and Sproles 1990)	.783	.793	.494			
1. There were so many products to choose from that I felt confused.				.690	.477	4.892 *(1.483)*
2. It was difficult to obtain an overview of all the products offered.				.729	.532	4.497 *(1.765)*
3. With so many options to choose between, I had hard time identifying how the products differed.				.825	.681	3.887 *(1.752)*
4. With so many options to choose between, I found it difficult to compare competing product offerings.				.537	.288	4.540 *(1.653)*
Collaborative Decision-making (Botti and McGill 2006)	.865	.868	.688			
1. I was not solely responsible for the product decision.				.830	.689	2.973 *(1.827)*
2. The decision for the product was not solely under my control.				.883	.779	2.860 *(1.668)*
3. No one except me was involved in the product choice. (r)				.771	.595	2.412 *(1.554)*

Notes: Seven-point Likert response scales were used for all items. AVE = average variance extracted, SD = standard deviation.

Since the following analysis consists of pooled data from two different product categories, we tested for measurement invariance of the composite models (MICOM) (Henseler, Ringle,

and Sarstedt 2016). The MICOM procedure confirmed full measurement invariance of the composite models, since configural invariance, compositional invariance, and equality of composite mean values and variances are considered to be applicable. Additionally, we performed several tests to assess common method bias (Harman 1976). As a single-factor test, an exploratory factor analysis revealed a multi-factor variable structure, with a total of 26.13% of variance explained by the first factor and a total of 68.24% of variance explained by all factors. Furthermore, adding a marker variable (attitude toward the university cafeteria) did not lead to significant changes in any relationship. Finally, the post-hoc method by Lindell and Whitney (2001) revealed that correlations between the variables in the model and the marker variable were below .085. Therefore, common method bias was judged not to be an issue. We also evaluated multicollinearity between the latent variables by examining the variance inflation factors (VIF). The highest calculated VIF was 2.59, far below the cut-off value of 5 (Hair et al. 2016).

3.4.2.2 Testing the Direct Effects of Information Source

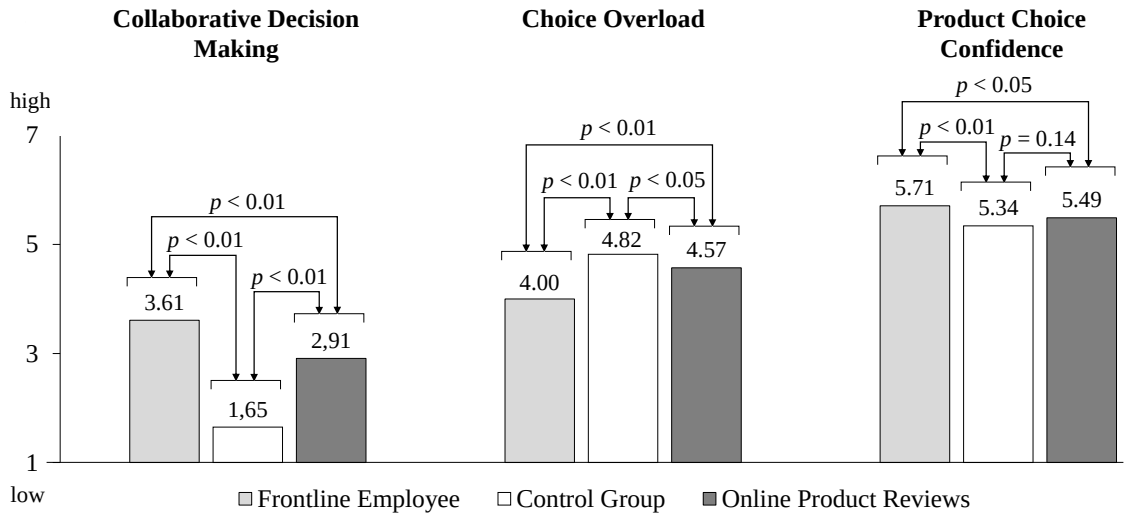
To investigate the effects of the type of information source on collaborative decision-making, choice overload, and choice confidence, we first conducted a multivariate analysis of variance (see Figure 4). With regards to collaborative decision-making, the results showed a main effect of information source ($F(2, 582) = 120.16$, $p < .001$), with participants in the frontline employee condition experiencing a greater perception of collaborative decision-making ($M_{frontline} = 3.61$, $SE = 1.43$) than those confronted with no external information source ($M_{control} = 1.65$, $SE = .86$; $t(387) = 16.49$, $p < .001$). The comparison of the frontline employee interaction group and the online product reviews group ($M_{reviews} = 2.91$, $SE = 1.39$) also showed that customers' perception of collaborative decision-making was significantly higher for the former ($t(395) = 4.95$, $p < .001$). Thus, Hypothesis 1 is supported. Furthermore, customers'

perception of collaborative decision-making was significantly higher in the online product reviews condition than in the control condition ($t(382) = 10.74$, $p < .001$).

For choice overload, a main effect of information source was evident ($F(2, 582) = 21.72$, $p < .001$). A comparison between participants in the frontline employee condition and participants in the online product reviews condition showed a significant difference, since the former led to a lower perception of choice overload than the latter ($M_{frontline} = 4.00$, $SE = 1.26$; $M_{reviews} = 4.57$, $SE = 1.31$; $t(395) = 4.37$, $p < .001$), in support of Hypothesis 2. Also, frontline employee interaction led to a decreased perception of choice overload as compared to when no external information source was used ($M_{control} = 4.82$, $SE = 1.19$; $t(387) = 6.55$, $p < .001$). In addition, choice overload was significantly greater among participants who used no external information source compared to those who used online product reviews ($t(382) = 1.98$, $p < .05$).

Finally, a significant effect of information source on customers' choice confidence existed ($F(2, 582) = 7.46$, $p < .001$). Compared to participants who used online product reviews ($M_{reviews} = 5.49$, $SE = .98$), participants in the frontline employee condition were more confident in their product choice ($M_{frontline} = 5.71$, $SE = .84$; $t(395) = 2.38$, $p < .05$), consistent with Hypothesis 3. In addition, participants in the frontline employee condition were more confident compared to those in the control condition ($M_{control} = 5.34$, $SE = 1.02$; $t(387) = 3.90$, $p < .001$). Comparing participants in the online review condition with those in the control condition, there was no significant difference ($t(382) = 1.48$, $p = .14$).

Figure 4 – Means and Mean Differences Across Information Sources



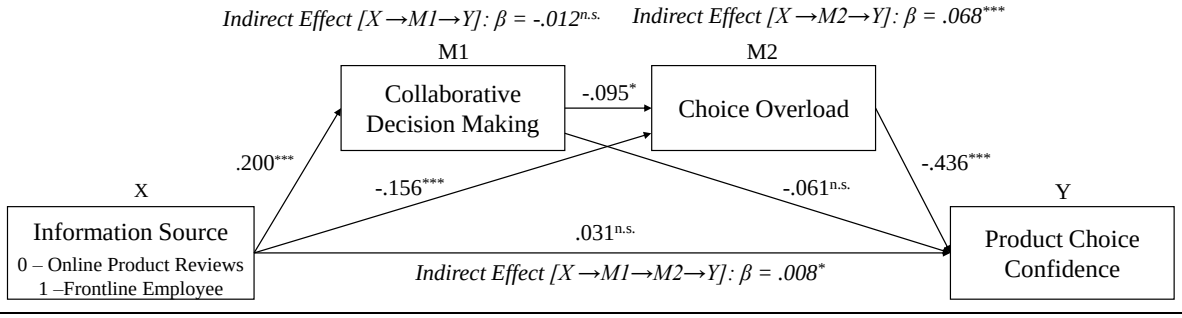
3.4.2.3 Testing the Indirect Effects

To test the serial mediation of collaborative decision-making and choice overload on choice confidence (Hypothesis 4), we used a bias-corrected bootstrapping procedure in PLS with 5,000 bootstrap samples. The results are shown in Figure 5. To analyze the relationship between information source and choice overload, we compared the direct and indirect effect via collaborative decision-making. The indirect effect of information source on choice overload was significant (β = -.019, 95% CI = [-.040 to -.003]). At the same time, the direct effect remained significant (β = -.156, t = 3.771, $p < .001$), which indicates a partial mediation. This means that—compared to mobile search for online product reviews—an interaction with a frontline employee decreases customers' perceptions of choice overload, which is partially explained by greater collaborative decision-making when interacting with a frontline employee.

The total indirect effect of information source on choice confidence, through collaborative decision-making and choice overload, was significant (β = .064, 95% CI = [.024 to .105]), while the direct effect was not significant (β = .031, t = 0.836, $p = .40$), indicating that the relationship between information source and choice confidence is completely explained by the mediators.

In addition, and in support of Hypothesis 4, the serial indirect effect via collaborative decision-making and choice overload was significant (β = .008, 95% CI = [.001 to .018]).

Figure 5 – Structural Model I



Notes: *** $p < .001$; * $p < .05$; n.s.: the relationship is not significant.

In sum, the findings provide empirical support for the hypothesized relationships. Specifically, frontline employees can be seen as a more beneficial information source than online product reviews in consumers' decision-making. For those customers who are shopping in bricks-and-mortar stores, and who may need help narrowing down the set of possible product alternatives under consideration in order to make a product choice, online product reviews are not as effective as a collaborative discussion with a frontline employee. The results further highlight that collaborative decision-making reduces choice overload and thereby increases customers' choice confidence.

3.4.2.4 Robustness Checks

In addition, to testing the conceptualized model, we analyzed an extended model (Model II; see Figure 6). Model II controls for several variables related to information characteristics and source characteristics (see Table 17), as these are well-established in the retailing literature and were also mentioned by participants in the qualitative study. By controlling for the influence of these factors, we intended to assess the robustness of the obtained results.

Table 17 – Correlations and Single-Item Questions

		(1) SRC	(2) CHC	(3) CHO	(4) CDM	(5) STR	(6) VAL	(7) CON	(8) QUA	(9) CRE	(10) EXP
(1) SRC	*Information Source*										
(2) CHC	*Choice Confidence*	.089									
(3) CHO	*Choice Overload*	–.173	–.303								
(4) CDM	*Collaborative Decision-Making*	.195	–.013	–.193							
(5) STR	The received information were well-structured.	.123	.226	–.179	.032						
(6) VAL	The received information were positive.	.272	.000	–.055	.000	.148					
(7) CON	The received information were consistent.	.148	.063	.000	-.032	.203	.399				
(8) QUA	The received information were extensive.	.000	.155	.000	.000	.355	-.071	.110			
(9) CRE	The sender of the information was credible.	.141	.212	–.114	.134	.332	.078	.190	.338		
(10) EXP	The sender of the information was experienced.	.376	.210	–.089	.176	.376	.158	.212	.367	.657	
(11) PER	The sender of the information was persuasive.	.100	.170	–.071	.152	.369	.078	.187	.354	.667	.646.

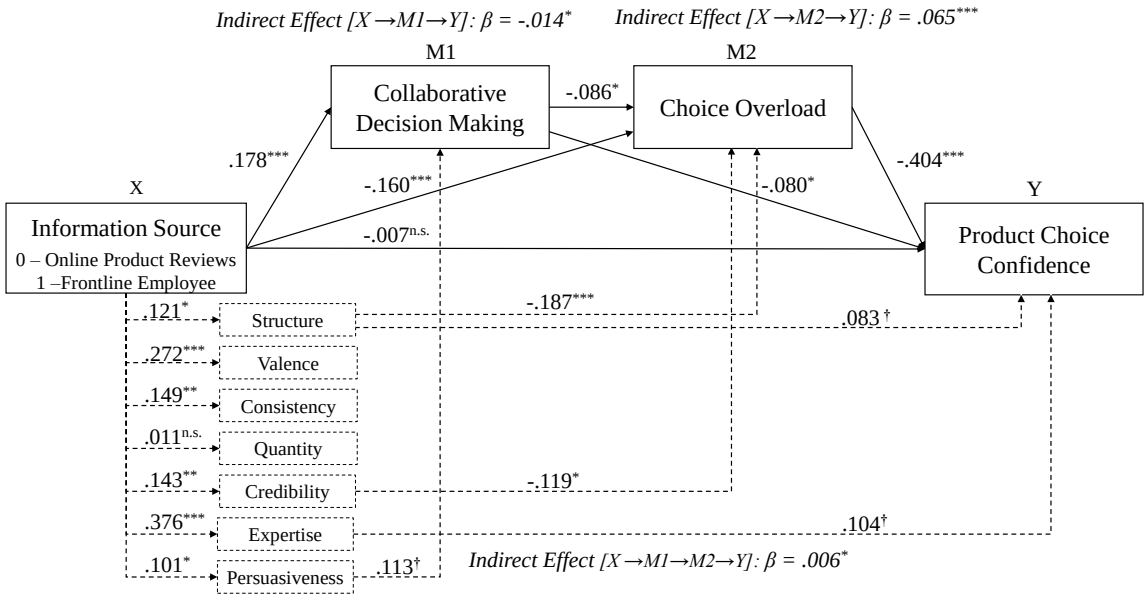
Notes: (1) SRC = Information source, (2) CHC = Choice confidence, (3) CHO = Choice overload, (4) CDM = Collaborative decision-making, (5) STR = Information structure, (6) VAL = Information valence, (7) CON = Information consistency, (8) QUA = Information quantity, (9) CRE = Source credibility, (10) EXP = Source expertise, (11) PER = Source persuasiveness

When accounting for the control variables, the direction and significance of all direct paths in the model are consistent with those obtained for Model I. Furthermore, the results support Hypothesis 4, since the indirect effect of information source on choice confidence was significant (β = .006, 95% CI = [.001 to .014]).

In addition to the hypothesized effects, the extended Model II findings indicate that information available through collaboration with a frontline employee was perceived as more structured, more consistent, and had a more positive valence than information obtained through mobile search of online product reviews. Further, frontline employees were seen as a more credible, expert, and persuasive information source compared to customers who had provided online product reviews. Perceptions of source persuasiveness increased collaborative decision-making, while both perceived structure of information and perceived source credibility helped

reduce choice overload. Lastly, choice confidence was positively affected by perceptions of information structure and source expertise.

Figure 6 – Structural Model II



Notes: *** $p < .001$; * $p < .05$; † $p < .1$; n.s.: the relationship is not significant. Only significant effects of the control variables are shown.

As a second robustness check, we tested for differences across the two different product categories (smart TV set versus washing machine). A multi-group analysis revealed no significant differences between the product categories regarding the collaborative decision-making – choice overload – choice confidence path. However, one notable difference emerged. The direct effect of information source on collaborative decision-making was more pronounced among participants who obtained information on TV sets (β = .290, t = 5.789, $p < .001$) than among those seeking information on washing machines (β = .131, t = 2.234, $p < .05$); the two path coefficients were significantly different from each other ($p < .05$). A closer examination of the means revealed that in the frontline employee condition, collaborative decision-making was judged to be equally high for both products. In the reviews condition, however, collaborative decision-making was higher in the washing machines category than in the TV category. Thus, although intriguing, because this effect is limited to online reviews, it appears to be driven by aspects outside of the scope of the investigation.

Table 18 – Results of PLS-Analysis

Determinants	Path Coefficient (β)	*t*-Value	R^2
Effects on Collaborative Decision-Making			
Model I			.04
Information Source [α]	.200	5.178 ***	
Model II			.04
Information Source [α]	.178	3.524 ***	
Information Structure	- .020	0.439 n.s.	
Information Valence	- .032	0.617 n.s.	
Information Consistency	- .074	1.489 n.s.	
Information Quantity	- .070	1.498 n.s.	
Source Credibility	.036	0.666 n.s.	
Source Expertise	.066	0.993 n.s.	
Source Persuasiveness	.113	1.868 †	
Effects on Choice Overload			
Model I			.04
Information Source [α]	- .156	3.771 ***	
Collaborative Decision-Making	- .095	2.296 *	
Model II			.04
Information Source [α]	- .160	3.335 ***	
Collaborative Decision-Making	- .086	2.011 *	
Information Structure	- .187	4.150 ***	
Information Valence	.001	0.027 n.s.	
Information Consistency	.035	0.764 n.s.	
Information Quantity	.060	1.322 n.s.	
Source Credibility	- .119	2.076 *	
Source Expertise	.093	1.453 n.s.	
Source Persuasiveness	.021	0.361 n.s.	
Effects on Product Choice Confidence			
Model I			.19
Information Source [α]	.031	0.836 n.s.	
Collaborative Decision-Making	- .061	1.565 n.s.	
Choice Overload	- .436	13.957 ***	
Model II			.43
Information Source [α]	- .007	0.172 n.s.	
Collaborative Decision-Making	- .080	2.138 *	
Choice Overload	- .404	11.728 ***	
Information Structure	.083	1.921†	
Information Valence	- .059	1.510 n.s.	
Information Consistency	.019	0.439 n.s.	
Information Quantity	.061	1.459 n.s.	
Source Credibility	.068	1.274 n.s.	
Source Expertise	.104	1.746 †	
Source Persuasiveness	- .008	0.150 n.s.	
Consequences of Information Source [α]			
Model II			
Information Structure	.121	2.441 *	.01
Information Valence	.272	5.842 ***	.07
Information Consistency	.149	3.036 **	.02
Information Quantity	.011	0.217 n.s.	.00
Source Credibility	.143	2.806 **	.02
Source Expertise	.376	7.869 ***	.14
Source Persuasiveness	.101	1.974 *	.01

Notes: *** $p < .001$; ** $p < .01$; * $p < .05$; † $p < .1$; n.s.: the relationship is not significant.
[α] Coding scheme of Information Source: Mobile Internet Source = 0; Frontline Employee Interaction = 1

3.5 General Discussion

3.5.1 Conclusion

The digital age offers new challenges and opportunities for retailers and customers alike. On the one hand, bricks-and-mortar retailers are faced with ever-increasing competition from online retailers who are able to operate without frontline employees and brick-and-mortar store space, putting huge downward pressure on prices. On the other hand, customers are confronted with a wide range of product options and are exposed to a vast amount of information about these products (particularly online), leading to an immense choice overload (Kuksov and Villas-Boas 2010). In order to survive and be successful, retailers need to adjust to the new reality. However, it is still unclear what the role of frontline employees should be in order to stay relevant in this information-rich environment, where detailed product information is at the customers' fingertips during their shopping and purchase process (Daurer et al. 2016). Determining whether frontline employees can effectively help customers reduce choice overload and choice uncertainty during the purchase decision process is the central question of the present research.

Our investigation suggests that customers process information differently when they personally interact with a frontline employee than when they access information online at the PoS. As a result, customers handle choice overload differently and make more confident purchase decisions. The mixed-methods approach reveals that the interaction-oriented information exchange with frontline employees drives customers to make use of collaborative decision-making, which results in a decreased choice overload and greater choice confidence, supporting Hypotheses 1-4. In contrast, our research findings suggest that information processing at the PoS differs when customers rely on online product reviews, with customers perceiving a lesser extent of collaborative decision-making and focusing more on information-

oriented characteristics (e.g., quantity, structure, consistency or valence of positive and negative product reviews).

Integrating two streams of literature, our investigation compares the effects of frontline employee interaction (e.g., Sharma 2001; Weitz 1978; Woodside and Davenport 1974) with those of reading online product reviews (e.g., Darley, Blankson, and Luethge 2010; Häubl and Trifts 2000; Lee, Park, and Han 2011; Senecal and Nantel 2004) in two field studies. In particular, the unique setting of the experimental quantitative field study with nearly 600 participants provides evidence of the external validity of our findings.

This research contributes to our understanding of customers' in-store purchase decision-making in several ways. First, drawing upon information processing theory, we bridge the gap between research on purchase decisions in a retailing context (e.g., Puccinelli et al. 2009) and collaborative decision-making, a phenomenon which has been mostly discussed in the literature on organizational buying centers (Mantel, Tatikonda, and Liao 2006). Second, we connect the literature on the role of frontline employees (e.g., Sharma 2001; Weitz 1978; Woodside and Davenport 1974) and of online product reviews (e.g., Häubl and Trifts 2000; Lee, Park, and Han 2011; Senecal and Nantel 2004) as drivers of customers' product choice and confidence. While, as already mentioned and to the best of our knowledge, Rippé et al. (2017) provide the only existing study on the role of both frontline employee and online product reviews in-store, our research is the first approach to compare these two information sources in an empirical setting.

3.5.2 Managerial Implications

In addition to these contributions to academic research, our study offers meaningful managerial implications. First, we demonstrate that frontline employees still play a critical role as an information source during customers' purchase decision processes in bricks-and-mortar stores, despite the increased frequency and usage of reading online product reviews in-store.

While retailers should consider innovative concepts of providing digital information about their products, it is imperative that they continue to rely on well-trained frontline employees in order to assist their customers in their decision-making process and increase their choice confidence. Bricks-and-mortar retailers should provide employee training in order to improve the interpersonal skills of their frontline employees (Puccinelli et al. 2013) with the focus on collaborative decision-making with customers. Second, despite the changes in the retail industry brought on by the advent of the Internet, expertise and credibility of the frontline employees remain key drivers of customers' choice confidence, in line with Weitz (1978) and Woodside and Davenport (1974). Thus, employee training should also focus on building employee product knowledge across a range of product categories. Retailers should also encourage employees to use the products personally, in order to be able to provide not only technical information, but also share personal product experiences with customers. Third, this research has managerial implications for online retailers as well. In addition to offering various filter functions and automated recommendation agents on their websites, online retailers are advised to consider implementing a variety of interaction tools that could mimic an interaction with a frontline employee and encourage collaborative decision-making in an online environment.

3.5.3 Research Implications and Limitations

First, our sample consisted of students with an average age of 21 years. These customers are on the border between the so-called Millennial Generation and the Generation Z. They represent a digital population, having grown up with the Internet, and are experts at digital interaction and information search (Moore 2012). As such, a comparison of the effectiveness of a personal interaction with a frontline employee versus reading online product reviews was of particular interest and relevance for this digitally advanced population. Despite their reliance on digital technology (Mangold and Smith 2012), these customers were found to rely on

collaboration with a frontline employee to a greater degree than on the information accessible online when making a product choice. Thus, we would expect that the results provide conservative estimates of what may be found in a general or older population. However, this expectation should be examined in future research employing a broader customer sample.

Second, data collection was limited to consumer electronics products. Thus, future research should examine the extent to which the present findings can be generalized to other store environments and product categories (e.g., grocery stores or less complex and more frequently purchased products).

Third, research participants were randomly assigned to one of the in-store information source conditions (frontline employee versus online product reviews). Thus, we were not able to investigate customers' simultaneous usage of both sources. The literature on showrooming suggests that customers sometimes use both information sources in combination (Rapp et al. 2015). Future research should include this condition as well.

Lastly, while the conceptual model was developed based on the constructs identified in the exploratory stage of our research, there are likely boundary conditions that may affect customers' choice confidence or other proposed relationships, which were not included in our model. For example, possible moderators of the proposed relationships, such as different cultures with more or less open communication between strangers, customer/employee personality (e.g., extroverted versus introverted), or different levels of customers' product knowledge or expertise could be tested in future research.

Overall, our findings confirm the important role that retail frontline employees still play in interacting with customers and assisting them in the decision-making process. Given the debate on the future of bricks-and-mortar retailing, the present research suggests that the idea of new store formats in which frontline employees will be replaced with in-store digital technology is not where we seem to be headed, at least not in the near future.

4 Essay III – In-Store Information Search in a Digital World: The Power of Control in Digital Communication and Its Influence on Persuasiveness

4.1 Abstract

The purpose of this study is to improve the knowledge on the value of mobile devices as a communication channel in contrast to personal interaction at the point of sale.

When customers are already in a brick-and-mortar store and need more information to choose the best fitting product, there are several ways to get such information. While personal interaction has been the most frequently used communication channel for an in-store information search for decades, mobile devices have become another important channel in the era of digital communication. Following up on this, customers can gather information via personal interaction or even by using a smartphone from an expert, such as a frontline employee or another customer who already has some experience with the product. To investigate the impact of different communication channels and information sources, we conducted three scenario-based online experiments with a total of 846 survey participants.

The investigation provides several important implications for business practices, contributes new aspects to existing research on customers' in-store information processing, and responds to the research gap of investigations about the impact of mobile device usage on customers' path to purchase. This study offers a first approach to bridge the gap between research on digital communication channels and information processing in the context of customer-frontline employee interaction. The findings confirm that, compared to personal interaction, smartphone-mediated communication diminishes negative heuristics of frontline employees such as perceived opportunism or persuasiveness, which can be explained by a higher perception of control over the communication process.

Keywords: *information source, communication channel, personal interaction, computer-mediated communication, perceived control.*

Additional Notes:

A prior version of this paper, co-authored by Sören Köcher (TU Dortmund University) and Hartmut H. Holzmüller (TU Dortmund University); Kessenbrock, A., Köcher, S., Holzmüller, H. H.: "Mobile In-Store Behavior: How Digital Content Enhances Frontline Employees' Persuasiveness", has been presented and discussed at the Academy of Marketing Association (AMA) Winter Educators' Conference in Las Vegas (2016; VHB-Jourqual3: D) and at the Academy of Marketing Science (AMS) Annual Conference in Orlando (2016).

4.1 Introduction

In an era where the number of communication channels is increasing (e.g., personal interaction, mobile internet, etc.), marketers are challenged by the question of how to communicate with customers (Ariely 2000). This issue is of particular interest for research as well as for brick-and-mortar retailers, as personal communication with frontline employees was the most sought-after information source for decades (Grewal, Roggeveen, and Nordfält 2017). However, the predominant role of personal interaction in the information search process seems to be losing importance due to the increasing number of digital communication channels.

More and more customers benefit from the extensive available online content, are practically "always online" (Jain and Pant 2012) and make use of this information via mobile devices at the point of sale (Cliquet et al. 2014). Especially with regard to reduced search costs, customers can search the Internet or use smartphone applications to quickly gather external information about product features or recommendations by other customers (Shugan 2004). Retailers therefore consider using this digital communication channel to interact with their customers and provide additional information such as recommendations, relying on the experience of their frontline employees (Solano 2018).

Scholarly literature has extensively investigated both the impact of customer-frontline employee interaction (see Bettencourt and Gwinner 1996 for a review), as well as the impact of consumer product reviews (see Darley, Blankson, and Luethge 2010 for a review) on customers' purchase decision-making process. On the one hand, frontline employees' expertise (e.g., Belonax Jr, Newell, and Plank 2007), credibility (e.g., Belonax Jr, Newell, and Plank 2007; Sharma 1990), and persuasiveness (e.g., Sharma 1990; Williams and Spiro 1985) were found to play an important role in customers' purchase decisions. Focusing on the interaction between frontline employees and customers, researchers also discuss a potential goal conflict between these two actors. Customers' interests (e.g., to reduce the information asymmetry and

make the best purchasing decision) and frontline employees' aims (e.g., to get a commission) often impair the persuasiveness of the latter at the point of sale (Andaleeb and Anwar 1996). On the other hand, prior studies have shown the impact of consumer product reviews on source persuasiveness (Schlosser 2011), credibility (Kusumasondjaja, Shanka, and Marchegiani 2012), and usefulness (Purnawirawan, Pelsmacker, and Dens 2012). Examining the impact of independent product reviews in the context of in-store information search behavior, Daurer et al. (2016) found that product reviews have a major influence on the purchasing process, whereas search for "price information is less important if customers have access to more types of product-related information" (p.5). However, additional information about product features and whether or not the product is recommended by third parties help customers to simplify their purchase decision.

Based on the findings on the impact of different information sources, such as frontline employees and consumer reviews, on customers' information processing, this study aims to examine differences of the used communication channel at the point of sale. More specifically, we compare personal interaction and smartphone-mediated communication to demonstrate how the communication channel affects the persuasiveness of the information source as perceived by customers.

Examining the impact of digital communication channels, an increasing number of studies has investigated the influence of mobile devices on customer in-store shopping behavior. Several of these studies explore the impact of such devices on customers' paths to purchase (e.g., Hui et al. 2013) while other studies analyze indirect effects of mobile usage that are irrelevant to the purchase process itself (e.g., private conversations or texting messages), but yet substantially affect customers' in-store behavior, such as product choice (e.g., Sciandra and Inman 2013). In addition, an expanding body of research has focused on mobile marketing (Bauer et al. 2005) in the forms of mobile promotion and advertising (e.g., Balasubraman, Peterson, and Jarvenpaa 2002), acceptance and usage of mobile devices (e.g., Park and Yang

2006), or mobile targeting (e.g., Goldfarb and Tucker 2011; Luo et al. 2013). Studies that examine mobile search behavior and the influence of information found on mobile devices at the point of sale on customers' information processing are relatively new to this stream of research (Daurer et al. 2016).

This essay is structured as follows. The next section reviews the relevant literature about consumers' information search behavior at the point of sale, focusing on the information source and the communication channel. Subsequently a pilot study is described that demonstrates whether the communication channel affects the relationship between the information source and persuasiveness. In order to better understand the mechanisms behind the effect of the information source on persuasiveness, and especially the influence of the communication channel on this relationship, we rely on the cognitive theory of persuasion by Eagly and Chaiken (1984) and discuss different concepts referring to computer-mediated communication and perceived control over the communication process. Building on this theoretical foundation this study also provides theoretical contributions, as we increase the knowledge on the influence of the communication channel on the communication process and customers' information processing. Afterwards, a series of scenario-based online experiments was conducted to address the research questions. The following discussion of the findings confirms that, compared to personal communication, smartphone-mediated communication leads to a higher perception of control over the communication process between customer and information source. Furthermore, perceived control was found to decrease the effect of negative perceptions, such as opportunism of the information source. With these insights, we contribute to literature about in-store information search, the impact of traditional and new communication channels, and the role of frontline expertise in future retailing. Finally, we provide several managerial implications for retailers and offer an outlook for future research.

4.2 Relevant Background

The topic of consumer information search behavior, particularly when it comes to purchase decisions, is a perennial and growing field of research. Several different perspectives and theoretical approaches have been developed to study this topic (e.g.,Malhotra 1982; Ross and Bettman 1979; Schmidt and Spreng 1996). A prevalent subject on consumer information search behavior is the distinction between internal and external information search. Internal information search means that consumers rely on their experience, and external information search refers to all other sources of information (Brucks 1985; Moore and Lehmann 1980). The research on external information search has increased significantly in response to the growing number of new communication channels (e.g., smartphones and mobile Internet in general) that provide access to a wide range of information.

4.2.1 Information Source and Communication channel

Communication channels and information sources are prominently featured in pertinent literature (Peterson and Merino 2003). Information source is defined as the sender of information, whereas communication channel refers to the manner in which the information gets from the sender to the receiver of a message (Lee, Law, and Luk 2015). We typically distinguish between online and offline communication channels (Frambach, Roest, and Krishnan 2007; Lee, Law, and Luk 2015). In addition, a wide range of studies deal with the type of information consumers search for (e.g., Lussier and Olshavsky 1979), such as their search motivations (e.g., Olshavsky and Wymer 1995), and search effort (e.g., Verplanken, Hazenberg, and Palenewen 1992).

Beatty and Smith (1987) classified consumer information sources into four categories: interpersonal search (e.g., consultation with family or friends), media search (e.g., advertising and promotion), neutral source search (e.g., consumer product reports, buying guides, and news articles), and retailer search (e.g., consultation with salespersons or other frontline employees).

In the context of consumers' in-store information search, researchers have concentrated on the impact of salespersons as a source of information, focusing on trust and credibility (e.g., Doney and Cannon 1997; Eisend 2006; Sharma 1990; Swan, Bowers, and Richardson 1999), expertise (e.g., Busch and Wilson 1976; Woodside and Davenport 1976), and performance (e.g., Churchill Jr et al. 1985; MacKenzie, Podsakoff, and Ahearne 1998; Weitz 1978).

4.2.2 Mobile In-Store Search

As already mentioned, more and more consumers rely on their mobile devices to search for information in-store. Daurer et al. (2016) found that product quality information such as product reviews written by previous customers represent a fundamental source of consumers' mobile in-store search. Regarding consumers' online shopping behavior, there is a broad body of literature on the impact of online reviews on consumers' product perceptions (e.g., Floh, Koller, and Zauner 2013; Vermeulen and Seegers 2009) and purchase decisions (e.g., Dellarocas, Zhang, and Awad 2007; Jiménez and Mendoza 2013; Li and Hitt 2008). In this context, empirical studies demonstrate evidence for a positive effect of online consumer ratings on sales (e.g., Chevalier and Mayzlin 2006; Clemons, Gao, and Hitt 2006; Dellarocas 2003; Hu, Liu, and Zhang 2008). In line with research about sales staff as a source of information, literature has focused on consumers' perception of online review credibility (e.g., Purnawirawan, Pelsmacker, and Dens 2012; Sher and Lee 2009) and usefulness (e.g., Purnawirawan, Pelsmacker, and Dens 2012). However, little research has been done on the influence of online reviews on consumers' purchase behavior while shopping in a brick-and-mortar store (Daurer et al. 2016).

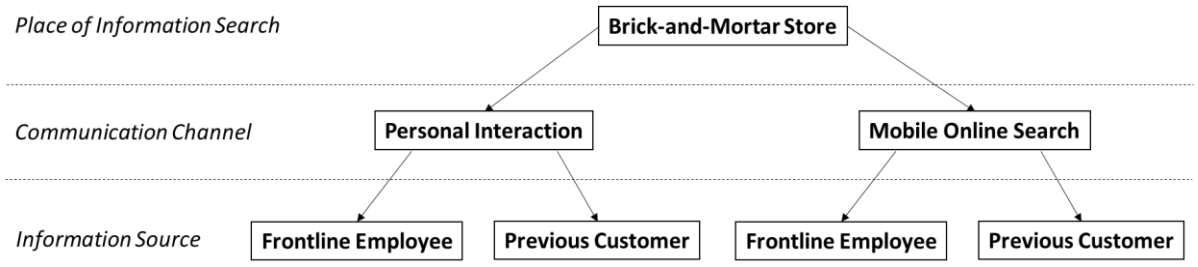
4.3 Pilot Study

Initially, an exploratory study on smartphone-mediated and personal communication at the point of sale was designed to achieve the following two aims: First, to provide insights into whether the persuasiveness of product recommendation depends on the communication channel. Second, to explore the diverging influence of the information source in different communication channel settings.

4.3.1 Method, Data Collection and Measures

According to previous research on the link between recommendations and persuasiveness, we employed an experimental approach (e.g., Herr, Kardes, and Kim 1991; Schlosser 2011). Undergraduate students were invited to take part in an online experiment. We conducted a 2 (mobile online search vs. personal interaction) × 2 (frontline employee vs. previous customer) between-subjects online experiment with 232 undergraduate students (M_{age} = 21.2 years, 43.1% female) who were randomly assigned to one of the four conditions.

Figure 7 – Experimental Conditions



All participants were asked to imagine themselves visiting a consumer electronics store to look for a new washing machine. As they considered a particular model, further product information and reviews were provided to verify whether the expectations placed in the performance of the washing machine were being matched. All participants were shown a

positive product review (constant across all conditions) with a clear recommendation that this washing machine is a high-quality product that works very well and is quick and user-friendly.

The communication channel was manipulated in such a way that participants in the personal interaction condition had to imagine that they received the information from a personal consultation, whereas respondents in the mobile online search condition were told to imagine a situation in which they used their mobile device to search and use the information available online. To manipulate the information source, participants in the frontline employee condition were told that the recommendation came from a frontline employee of the store, while participants in the previous customer setting were told they received a recommendation from another customer who already has some experience with the product. More specifically, participants in the mobile conditions got an identical recommendation, displayed on the screen of their mobile device, with additional information about the information source ("this product review is written by another customer" vs. "this product review is written by a frontline employee of this store). Depending on the information source, participants in the personal interaction condition were told to imagine that they asked a frontline employee or another customer in the store for product-related advice.

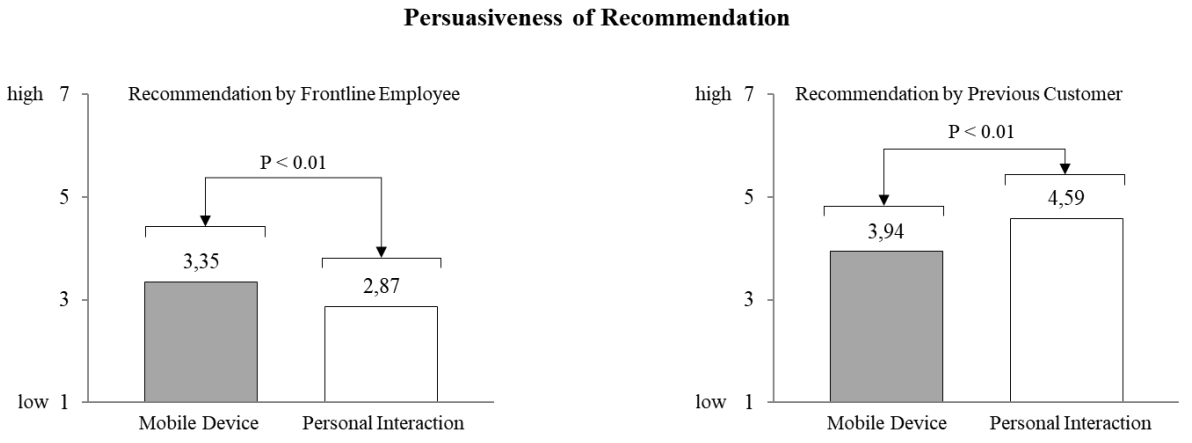
The measurement of persuasiveness relied on the work of Gürhan-Canli and Maheswaran (2000). All measures were assessed on 7-point scales, anchored by "strongly disagree" (1) and "strongly agree" (7). In addition, to control for potential external influences, customers' knowledge about the product class (Flynn and Goldsmith 1999) and age were also measured to be included as a covariate (Table 19 provides an overview of all measures). Moreover, as a realism check, participants responded to questions related to the degree of realism of the experimental scenarios (Dabholkar 1994). Responses to these items indicated a sufficient level of realism of the described situations for all four conditions ($M_{realism} = 5.58$).

4.3.2 Results

An ANCOVA revealed a significant main effect of information source ($M_{employee}$ = 3.31 vs. $M_{customer}$ = 4.35; F(1, 220) = 56.52, p < .001) on persuasiveness. This effect depends on the communication channel, since the information source × communication channel interaction was significant (F(1, 220) = 14.99, p < .001). However, there was no significant direct effect of communication channel on persuasiveness ($M_{personal}$ = 3.63 vs. M_{mobile} = 3.64; F(1, 280) = 0.04, p = .83).

A spotlight analysis revealed that recommendations by a frontline employee were generally perceived as less persuasive than those by another customer; the negative effect of frontline employee interaction on persuasiveness was abrogated when a mobile device was used as communication channel (t(113) = 7.73, p < .01). In contrast, exactly the opposite effect applied to mobile devices in case of a customer recommendation (see Figure 8). While smartphone-mediated communication increased the persuasiveness of the frontline employee, feedback from other customers via digital communication had the opposite effect (t(107) = 7.24, p < .01).

Figure 8 – Mean Differences (Mobile Device vs. Personal Interaction)



4.3.3 Discussion

The experiment examines the initial influence of the communication channels on persuasiveness. Importantly, this study provides evidence for a contradictory effect. On the one

hand, a digital communication channel increases the persuasiveness of information by a frontline employee; on the other hand, customers' advice is more convincing in a personal conversation. However, it must be acknowledged that this study is of explorative nature. Therefore, the following section is intended to provide a better understanding of the underlying mechanisms of these opposing effects on a theoretical basis.

4.4 Theoretical Background and Development of Hypotheses

4.4.1 Perceived Opportunistic Intentions

As customers are interested in reliable information before choosing a product, their perception of the intentions of the information source plays an important role in processing information. One approach to explain information processing is offered by the cognitive theory of persuasion (Eagly and Chaiken 1984). Derived from attribution theory, recipients of a message have a pre-message expectation as far as the information source (sender of the information) and his/her behavior is concerned. If a message recipient expects incomplete or erroneous information (reporting bias) and his expectation is confirmed during post-message evaluation, the testimony will be attributed to the personal interest of the communicator, for example opportunistic intentions, which results in negative attributions toward the information source such as a devaluation of trust and persuasiveness (Andaleeb and Anwar 1996). Therefore, the cognitive theory of persuasion suggests that "the persuasive impact of different types of messages is moderated by the extent to which the communication modality makes salient message-relevant versus non-message-relevant (e.g., social) cues" (Guadagno and Cialdini 2002, p. 39).

Another possible explanation for perceived opportunistic intentions in the context of product-related information search is offered by the heuristic-systematic model (HSM) by Chaiken (1980). This model is an attempt to explain the difference between heuristic and systematic processing of information. For this reason, HSM provides a superficial processing approach so that recipients are more focused on surface features (e.g., suspected intentions or the number of arguments). Heuristics are defined as mental shortcuts that help people to make a quick decision based on learned rules-of-thumb (Tversky and Kahneman 1974).

As already mentioned, the cognitive theory of persuasion suggests prejudices about the information sources' intentions. In combination with HSM, the characteristics and interests of

the communicator lead to heuristic information processing (Ratneshwar and Chaiken 1991). Thus, there can be a lack of confidence due to heuristics such as: “Frontline employees appear to place their interests before my own and like to take advantage of mine” (Andaleeb and Anwar 1996, p. 38). In contrast, consumer product reviews are mostly seen to be driven by altruistic intentions (Willemsen, Neijens, and Bronner 2013). Finally, customers’ heuristic information processing leads to an evaluation of the information source and its persuasion. The following hypothesis summarizes this argumentation:

Hypothesis 1*:* *Compared to consumers as information source, an interaction with a frontline employee leads to higher perceptions of opportunism, which in turn reduces the persuasiveness. In this sense, perceived opportunistic intentions mediate the relationship between the information source and its persuasiveness.*

4.4.2 Perceived Control

Perceived control is part of several research streams, such as the theory of planned behavior (Ajzen 1991), the flow theory (Csikszentmihalyi 1975) or the theoretical framework of self-efficacy (Rotter 1966). In a broader sense it is defined as customers’ control over their actions and environments (Koufaris 2002). Especially in the context of information technologies and consumers’ online shopping behavior, flow theory is a common approach to explain consumers’ perception of control over the interaction in computer-mediated communication (CMC; Trevino and Webster 1992). In any kind of communication based on digital communication channels (e.g., mobile devices) information exchange is allocated to CMC, which provides the counterpart to traditional personal interactions (Kiesler, Siegel, and McGuire 1984). In this sense, Collier and Sherrell (2010) argued that perceived control over the communication process is triggered by customers’ capability to stipulate the information flow and the level

interaction, which is the case in CMC. Rippé et al. (2017) already demonstrated this positive relationship between mobile Internet search and perceived control.

In conjunction with the social presence theory (Short 1974; Short, Williams, and Christie 1976), CMC provides the basis for several theories on effects of digital communication channels. Recent studies that investigate different communication modalities in this theoretical context suggest that "individuals who communicate through this socially constrained mode are less focused on their partners and more focused on the assigned task" (Guadagno and Cialdini 2002; Kiesler et al. 1985). Due to the reduction of sensory cues in CMC conditions, communication becomes faceless. This anonymity results in increasing the perceived control of the communication process and the distance to the information source. In contrast, social presence in face-to-face modality make one think about the communicator's qualities and intentions (Short, Williams, and Christie 1976), which affects the persuasiveness of the message (Guadagno and Cialdini 2002; Matheson and Zanna 1989). Research in the area of computer-mediated communication provides further insights into the link between perceived opportunistic intentions and recommendation persuasiveness. In particular, this stream of literature and corresponding theories suggest that socially constrained communication—for example through the usage of mobile devices as a computer-mediated communication channel—is the relevant factor for how intensively the recipient thinks about the information source in the context of suspected intentions. Accordingly, if there is no personal interaction, the attributed intentions of the communicator become almost irrelevant. Hence, social cues and perceived motives of the source lose their effects on persuasiveness when using digital communication channels, whereas communication via personal interaction intensifies precisely these attenuating effects. The following hypothesis concludes the above considerations:

***Hypothesis 2**:* *The communication channel moderates the relationship between perceived opportunistic intentions and persuasiveness. CMC attenuates the relationship, whereas personal interaction enhances the effect of perceived opportunistic intentions on persuasiveness.*

As mentioned above, social presence theories suggest that, if anonymity increases, the perception of control over the information flow is also higher. With regard to the investigation, customers perceive strong control by using mobile devices as communication channel due to the personal absence of the source. As a consequence, perceived control weakens the effect of perceived (opportunistic) intentions behind the recommendation. In light of the predicting argumentation, it is hypothesized:

***Hypothesis 3**:* *The moderating effect of the communication channel on the relationship between perceived opportunistic intentions and persuasiveness is mediated by perceived control. Compared to personal interaction, mobile device usage increases customers' perceived control over the communication process which attenuates the relationship between perceived opportunistic intentions and persuasiveness.*

4.5 Quantitative Study: The Moderating Role of Perceived Control

4.5.1 Procedure, Sample Characteristics and Measures

To empirically test the proposed hypotheses, we conducted two 2x2 between-subject online experiments (Study 2a and 2b) with the manipulation of communication channel (mobile online search vs. personal interaction) and information source (frontline employee vs. previous customer). Generally, Study 2a used exactly the same cover story as Study 1, whereby Study 2b was intended to investigate the abovementioned relationships with a more heterogeneous sample and a different product (a digital single-lens reflex camera) with respect to potential external validity issues. However, compared to the first study, these experiments used a sample of undergraduate but also graduate students in Study 2a: ($N = 354$, $M_{age} = 23.4$ years, $SD_{age} = 3.4$, 58.5% female) and a non-student sample in Study 2b: ($N = 260$, $M_{age} = 35.2$ years, $SD_{age} = 10.9$, 58.1% female). Perceived opportunistic intentions, the proposed mediator, was measured with four indicators similar to the opportunism scale by Weigel, Hessing, and Elffers (1999). In addition, perceived control over the communication process was measured by a single item (Claessens 2004). As previous research showed that customers' need for human interaction can be related to persuasiveness (e.g., Alias and Zainuddin 2005), we added a control measure for need for human interaction (Aslanzadeh and Keating 2014). Since none of the measured control variables was found to have a significant effect in our model in study 2a, we excluded those measures from study 2b. Again, we asked participants to assess the realism of the scenarios, using the same items as in the first study. Responses to this measure confirmed that the respondents' perceived realism of the described situations can be considered as satisfactory ($M_{Study2a} = 5.92$, $M_{Study2b} = 5.64$). We assessed the convergent validity of persuasiveness and perceived opportunistic intentions using SmartPLS Algorithm (Ringle, Wende, and Becker 2015). According to the factor loadings, Cronbach's alpha, composite reliability, and average variance extracted values, the scales exceeded the common thresholds

(see Table 19). In addition, we achieved discriminant validity according to the Fornell-Larcker criterion (see Table 20).

Table 19 – Employed Constructs and Psychometric Properties

	CAs	CRs	AVE	Loadings
Persuasiveness of information source Gürhan-Canli and Maheswaran (2000)	.89 / .89 / .94	- / .93 / .96	- / .83 / .89	
"The person behind the recommendation …"				
x_1 …was very convincing.				.89 / .86 / .93
x_2 …was compelling.				.90 / .93 / .95
x_3 …was very persuasive.				.93 / .93 / .95
Perceived opportunistic intentions Weigel et al. (1999)	- / .93 / .90	- / .95 / .93	- / .84 / .76	
"The person behind the recommendation …"				
x_4 …pursued only his own interests.				- / .92 / .83
x_5 …was indifferent to my needs.				- / .94 / .92
x_6 …was acting selfishly.				- / .85 / .85
x_7 …was not concerned with me.				- / .95 / .90
Perceived control Claessens (2004)				
x_8 I was in control of *the communication process*.				
Need for human interaction *(control variable)* Aslanzadeh and Keating (2014)	- / .76 / -			
x_9 Personal contact with people makes *shopping* enjoyable for me.				- / .87 / -
x_{10} Personal advice is important to me.				- / .88 / -
x_{11} People do things that no machine could.				- / .67 / -
x_{12} It bothers me to use a machine when I could talk to a person instead.				- / .64 / -
Knowledge of the product class *(control variable)* Flynn and Goldsmith (1999)	.89 / .87 / -			
x_{13} I feel quite knowledgeable about *washing machines.*				.89 / .86 / -
x_{14} Among my circle of friends, I'm one of the "experts" on *washing machines*.				.80 / .73 / -
x_{15} Compared to most other people, I know more about *washing machines*.				.88 / .85 / -
x_{16} I do not feel very knowledgeable about washing machines. (r)				-.87 /-.85 / -
x_{17} When it comes to *washing machines*, I really don't know a lot. (r)				-.85 /-.82 / -
Realism Check Dabholkar (1996)	.85 / .80 / -			
x_{18} The situation described was realistic.				.89 / .88 / -
x_{19} I had not difficulty imagining this situation.				.94 / .91 / -
x_{20} The described situation was easy to imagine.				.83 / .77 / -

Notes: All Items measured on 7-point Likert-scale, anchored by 1 – "totally disagree" and 7 – "totally agree". (r) reverse scoring item. CA = Cronbach's Alpha, CR = Construct Reliability, AVE = Average Variance Extracted. Results for each value are structured as following: Study 1 / Study 2a / Study 2b

Table 20 – Squared Construct Correlations and Average Extracted Variance Values

	Persuasiveness (1)	Perceived Opportunism (2)	Perceived Control (3)	Communication Channel (4)	Source of Information (5)
(2)	0.194	1.000			
(3)	0.022	0.001	1.000		
(4)	0.001	0.004	0.105	1.000	
(5)	0.177	0.236*	0.009	0.011	1.000
AVE	0.887	0.762**	1.000	1.000	1.000

Notes: AVE = Average Variance Extracted, *highest squared correlation value, **lowest AVE value.

4.5.2 Results

The subsequently documented data analysis follows a three-step approach: In a first step, a series of AN(C)OVAS and t-tests with the data of Study 2a was used to examine whether the findings of Study 1 can be replicated with a similar sample structure. In a second step, we tested Hypothesis 1 and Hypothesis 2 using conditional process analysis with the data of Study 2a and Study 2b (Hayes 2017). This analysis lends itself particularly well to comparing conditional indirect effects, such as the indirect effect of the examined communication channels on persuasiveness. In a last step, the proposed Hypothesis 3 was tested by using partial least squares (PLS) path modeling with SmartPLS 3.2.7 software (Hair et al. 2016). In contrast to Hayes' conditional process analysis, which only allows to analyze a number of predefined models, PLS can be used for complex models, which is necessary to examine the specific indirect effects of communication channel via perceived control as the predicted moderator on the relationship between perceived opportunism and persuasiveness.

An ANOVA revealed a significant main effect of information source ($M_{frontline}$ = 3.63 vs. $M_{customer}$ = 4.89; $F(1, 350) = 81.23$, $p < .001$) on persuasiveness. This effect was dependent of the communication channel, as the information source × communication channel interaction was significant ($F(1, 350) = 11.00$, $p < .001$). However, there was no significant effect of

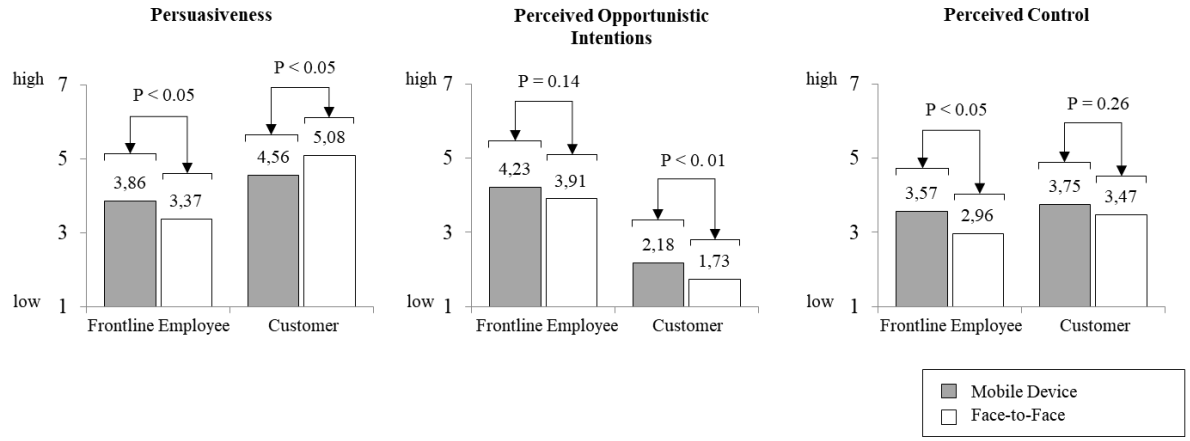
communication channel on persuasiveness ($M_{personal}$ = 4.27 vs. M_{mobile} = 4.21; F(1, 350) = 0.04, p = .84). Hence, in line with Study 1, while recommendations by frontline employees were generally perceived as less persuasive, there was a diverging effect of communication channel between recommendations by customers and frontline employees (see Figure 9). While the negative effect of a frontline employee as information source on persuasiveness was attenuated in the context of using a mobile device (t(178) = 2.34, p < .05), there was an opposing effect of mobile devices vs. personal interaction in case of customer recommendation conditions. While mobile devices increase the persuasiveness of frontline employees, the communication channel has a negative effect on persuasiveness (t(172) = 2.38, p < .05).

An ANOVA revealed significant main effects of information source (F(1, 280) = 258.67, p < .001) and communication channel (F(1, 350) = 13.93, p < .01) on perceived opportunistic intentions. However, there was no significant difference between customers who received the recommendation in a personal interaction (M = 3.90, SD = 0.16) and those in the mobile device condition (M = 4.24, SD = 0.15) on persuasiveness (t(178) = 1.49, p = .14) in the frontline employee context. Communication channel had only a significant effect on perceived opportunistic intentions in the customer recommendation conditions (t(172) = 3.36, p < .01). Additionally, no significant information source × communication channel interaction emerged (F(1, 350) = .28, p = .64). In sum, perceived opportunistic intentions were mainly influenced by the information source.

Finally, the analysis of the effects on perceived control by means of an ANCOVA only revealed a significant main effect of communication channel in that recommendations on mobile devices were perceived as more controllable (M = 3.65) than those in a personal interaction (M = 3.23, F(1, 349) = 7.36, p < .01) after controlling for the significant effect of age (F(1, 349) = 9.26, p < .01). Neither the main effect of the source (F(1, 349) = 3.63, p = .06) nor the information source × communication channel interaction (F(1, 349) = 1.18, p = .28) reached significance. Hence, the effect of communication channel on perceived control was

independent of the information source. Non-significant covariates were excluded from the analysis.

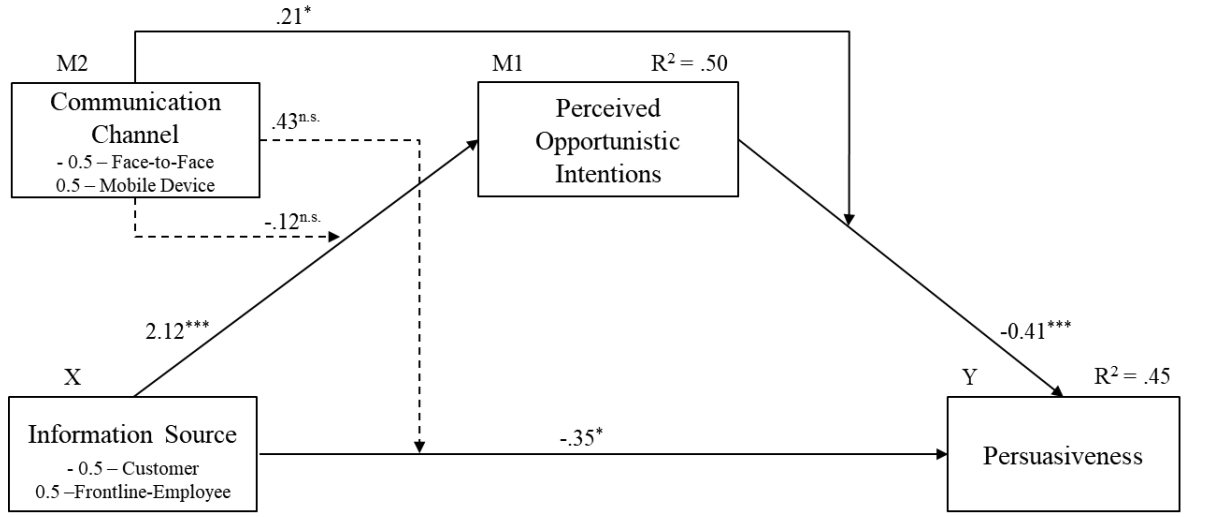
Figure 9 – Mean Differences and Paired t-Tests



We pursued the next step to confirm the findings of Study 1 regarding the process underlying persuasiveness of the recommendation in both communication channels. Therefore, a model with information source (-0.5 = recommendation by customer; 0.5 = recommendation by frontline employee) as independent variable, persuasiveness as dependent variable, and perceived opportunistic intentions as mediator of their relationship, as well as communication channel (-0.5 = personal; 0.5 = mobile device) as moderator of all model relationships was estimated. As displayed in Figure 9, and in line with Hypothesis 1, the impact of persuasiveness was mediated by perceived opportunistic intentions. Since a significant perceived opportunistic intentions × communication channel interaction effect on persuasiveness emerged ($\beta = .21$, $SE = .10$, $t(348) = 2.00$, $p < .05$), the conditional indirect effect of information source was stronger with personal interaction as communication channel ($\beta = -1.14$, $SE = .18$, CI: −1.51 to −.79) than with a mobile device as communication channel ($\beta = -.64$, $SE = .19$, CI: −1.03 to −.30). The analysis of Study 2b revealed similar results, as the standardized indirect effect of information source on persuasion was highly significant ($\beta = -.151$, $SD = .03$ CI: −.215 to −.094).

Despite the inclusion of perceived opportunistic intentions in the model, the direct effect of information source on persuasion was still significant (Study 2a: $\beta = -.36$, SE = .17, $t(348) = -2.15$, $p < .05$; Study 2b: $\beta = -.26$, SD = .06, $t(254) = 4.38$, $p < .01$), whereas the information source × communication channel interaction ($\beta = .43$, SE = .34, $t(278) = 1.26$, $p = .21$) turned out to be statistically insignificant for in-store information search. Again, there was no direct effect of communication channel on persuasiveness ($\beta = .20$, SE = .13, $t(348) = 1.55$, $p = .12$), but a direct effect of communication channel on perceived opportunistic intentions ($\beta = .40$, SE = .13, $t(350) = 3.01$, $p < .01$) emerged. Even though the mediation of perceived opportunistic intentions could not completely explain the effect of source on persuasiveness in this model, the presumed effects were confirmed in Study 2a and Study 2b.

Figure 10 – Conditional Process Analysis I



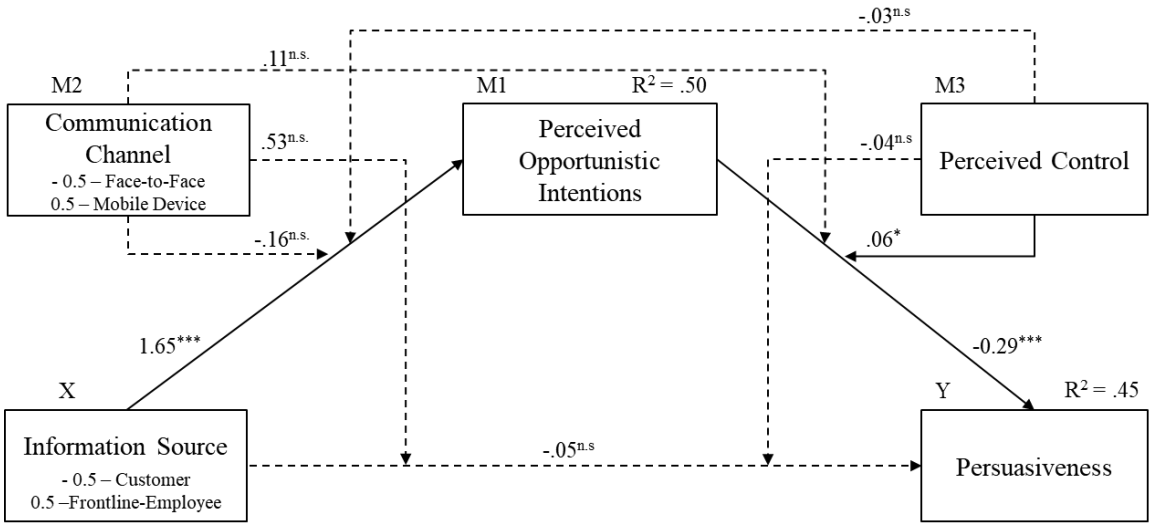
Notes: *** $p < .001$, * $p < .05$, n.s.: the relationship is not significant. Dashed lines indicate non-significant paths.

As participants in the mobile conditions perceived significantly more control of the communication process than respondents in the personal interaction conditions, we tested whether these different levels of control can be attributed to the attenuated effects of information source on persuasiveness, by simultaneously estimating the effects of communication channel and perceived control. As illustrated in Figure 10, a simultaneous analysis of the moderating effects of communication channel and perceived control of the

communication process revealed that the relationship between perceived opportunistic intentions and persuasiveness (β = -.29, SE = .05, t(345) = 5.75, p < .001) was moderated by perceived control (β = −.12, SE = .05, t(345) = 1.97, p < .05), but not by the channel per se (β = .11, SE = .10, t(345) = 1.19, p = .24). Therefore, an increasing perceived control attenuates adverse consequences of frontline employee as information source on persuasiveness via its moderating effect on the relationship between perceived opportunistic intentions and persuasiveness.

To finally show evidence for a continual indirect effect of communication channel in an in-store setting via perceived control on the link between perceived opportunistic intentions and persuasiveness, we followed the suggestions of Bagozzi and Yi (1989) and employed partial least square (PLS) structural equation modeling for the data of Study 2a and Study 2b.

Figure 11 – Conditional Process Analysis II

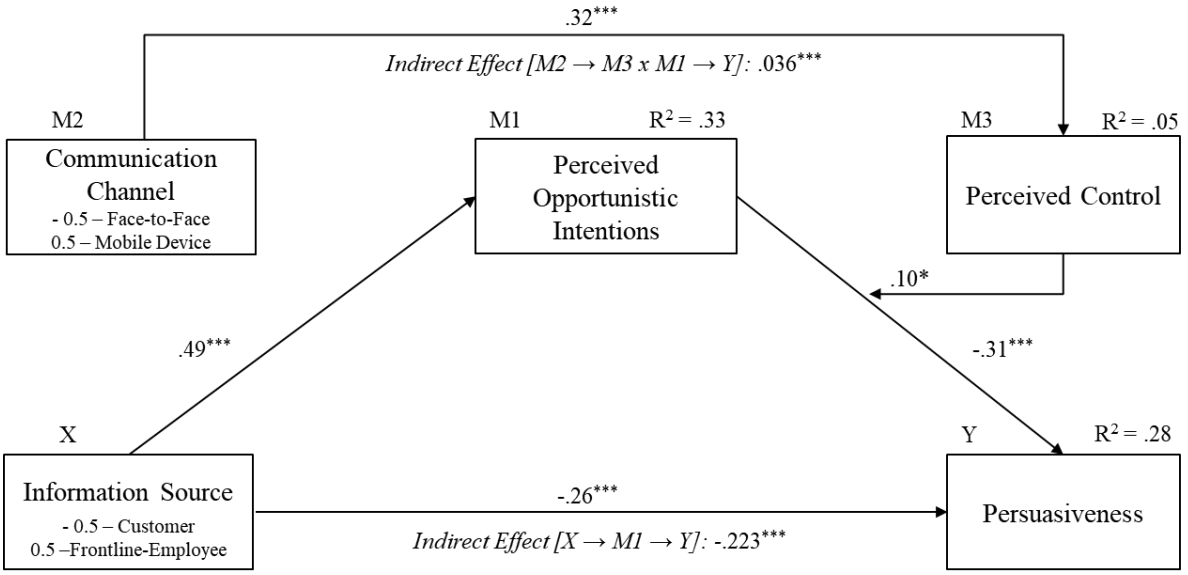


Notes: *** p < .001, * p < .05, n.s.: the relationship is not significant. Dashed lines indicate non-significant paths.

For both contexts, and in line with Hypothesis 3, the analyses demonstrated significance at a level of 5% for the path between the communication channel and persuasiveness (Study 2a: β = .022, t = 1.960, p = .05; Study 2b: β = .041, t = 2.158, p < .05). Figure 12 illustrates the path coefficients and their significance for the structural model for the overall sample of Study 2a and 2b.

The results of Study 2a and 2b extend the findings of Study 1 in two important ways. First, they provide a robust replication of the impact of information source on persuasiveness, and the contradicting effect of mobile device as an in-store communication channel. Second, the follow-up study provides evidence of the proposed mediating role of perceived opportunistic intentions (H1). More specifically, the result of this experiment confirms that the link between perceived opportunistic intentions and persuasiveness is moderated by the communication channel (H2), which is explained by the mediating role of perceived control (H3).

Figure 12 – Structural Model



Notes: ***p < .001, *p < .05

4.6 General Discussion

4.6.1 Conclusion

Since brick-and-mortar retailers face challenges in interacting with their customers in a suitable way, digital communication channels should also be considered for in-store communication. However, brick-and-mortar stores have the advantage of highly skilled employees as a vital information source for their customers. The central objective of this study is to determine whether frontline employees can effectively help customers without personal interaction, and how digital communication between frontline employees and customers affects customers' information processing while shopping in-store. Contrary to a large number of studies that only investigate the influence of recommendations on customers' behavior, this study provides an approach to simultaneously examine the effects of communication channels and sources. More specifically, it offers an initial attempt to understand the effects of mobile devices, as a new communication channel, on customers' perceptions of persuasiveness, and the importance of customers' perceived control over the communication process at the point of sale.

The results suggest that customers who use their mobile devices to search for product advice instead of interacting personally are more likely to adopt recommendations by frontline employees, even though this information source is presumed to act opportunistically. Our findings also provide evidence that this effect can be explained by a greater perception of control over the communication process, which is triggered by digital communication channels, supporting Hypotheses 1-3. Although the findings suggest that digital communication channels increase the quality of the frontline employee-customer communication, personally receiving recommendations by another consumer is more convincing.

Despite retailers' quest to increase the understanding of the impact of new communication channels on customers' purchase decisions, this stream of research was previously neglected.

In this context, the study contributes new aspects to existing research on frontline employees' persuasiveness (Ratneshwar and Chaiken 1991; Rippé et al. 2016; Sharma 1990), while taking account of contemporary communication structures (Ramirez et al. 2002). Furthermore, we contribute to research about the effect of CMC on perceived control (Kiesler, Siegel, and McGuire 1984; Rippé et al. 2017), as we found a relationship between different communication channels and perceived control over the communication process.

4.6.2 Managerial Implications

This study provides several important implications for business practices. In a first step, it is important for retailers to provide their customers with the opportunity to gather additional information from an employee via digital communication channels. Thereby retailers can convey the impression that customers have control over the information process, which reduces the potential negative impact of adverse heuristics associated with the frontline employee. In order to fulfill these requirements, even brick-and-mortar retailers would need to implement a multichannel strategy with a focus on providing digital content. Even though a large number of customers need personal interaction, employees should be instructed to include digital content in that interaction. Retailers can therefore use new communication channels to strengthen the relationship with their customers and protect themselves against competition from online retailers.

Next, retailers should also focus on existing prejudices against frontline employees' intentions while interacting personally. The results demonstrate that customers still have certain negative attitudes toward frontline employees with regard to opportunistic behavior. This may be a major problem, as personal interaction between customers and frontline employees is the dominant communication channel. One way to increase persuasiveness might be to give customers more control during a personal consultation. While making use of digital communication channels, frontline employees can actively involve online content and further

information by interacting personally to underline their primary intention to help their customers.

4.6.3 Research Implications and Limitations

Besides practical implications, this study opens various avenues for further research. For instance, future research should explore different strategies for retailers to increase customers' perception of control. Even though many studies examine different sales strategies, such as customer orientation (Homburg, Müller, and Klarmann 2011), the impact of perceived control on the employee-customer interaction is rather rare (Rippé et al. 2017). Academic research is needed to identify further drivers of perceived control to clarify whether there are more ways for retailers to improve the employee-customer interaction. While this investigation focuses on customers' mobile device usage, there are several opportunities for retailers to actively provide digital content at the point of sale. Therefore, future research should extend our findings by comparing further communication channels (e.g., Schoenbachler and Gordon 2002).

However, the number of customers who use their mobile device in-store to search for product-related information is constantly increasing (Grewal, Roggeveen, and Nordfält 2017). For this reason, future research should pay attention to how this trend affects customers' in-store information search and product decision-making. Especially the phenomenon of showrooming can be a danger to remain competitive compared with online retailer (Gensler, Neslin, and Verhoef 2017; Rapp et al. 2015) and underlines the need for further investigation in the area of customers' information search and their path to purchase at the PoS.

5 Conclusion

The main focus of this doctoral dissertation is to compare the interaction between customers and frontline employees with the use of online product reviews as the two most frequently consulted information sources at brick-and-mortar stores. Against this contextual background, the presented essays intend to answer relevant questions about the influence of communication channels and information sources in different stages of customers' decision-making processes.

Using a mixed-methods approach, Essay I addresses the question whether personal interaction with a frontline employee affects customers' purchase channel choice compared to mobile online search at the point of sale. The results show that the used communication channel steers consumers to purchase in the same channel. Consumers who interact with a frontline employee, therefore, prefer to purchase offline, and mobile Internet search has a positive effect on switching to a competitor's online channel. Furthermore, the identified channel lock-in effect demonstrates robustness when controlling for several channel characteristics such as price differences, delivery time, and travel time to the brick-and-mortar store.

Essay II provides insights into the second research question of this thesis; how customer-employee interaction and mobile online reviews influence consumers' purchase decision-making. First, rich qualitative data from 350 participants, captured directly after an in-store shopping experience, reveal differences between the two information sources regarding their potential to create choice confidence. In particular, frontline employee interaction was linked to collaborative decision-making, whereas purchase decisions based on reading online product reviews in-store were perceived to be less collaborative. Second, based on these exploratory findings, a field experiment with 585 participants supports the assumption that frontline employee interaction leads to more collaborative decision-making, less choice overload, and, in consequence, more choice confidence. Thus, the investigation suggests that customers process information differently, depending on the used information source.

Focusing on the last research question of this doctoral dissertation, Essay III offers an initial attempt to understand how mobile devices, as a new communication channel, affect customers' perceptions of persuasiveness, and the central role of customers' perception of control over the communication process, while searching for information at the point of sale. In this light, potential effects of information sources and communication channels have been considered separately. The results suggest that customers who use their mobile devices to search for product advice instead of personal interaction are more likely to adopt recommendations from frontline employees, even though this information source is presumed to act opportunistically. In this respect, perceived control over the communication process, which is triggered by digital communication channels, was found to explain the diminishing effect between perceived opportunism and persuasiveness of the information source.

While answering these central research questions, this thesis also provides a variety of managerial implications and raises questions for future research. Consistently, Essay I and Essay II contribute to the future role of frontline employee management and demonstrate the importance of frontline employees for both, retailers and customers. Since the investigations have shown that mobile online search steers customers to purchase at competitive online shops, brick-and-mortar retailers are encouraged to provide proactive consumer advice by their frontline employees. In this context, retailers should compare prices with online competitors and avoid substantial price differences. In addition, brick-and-mortar retailers should strongly communicate advantages such as customer service, and online disadvantages such as longer delivery times. However, it is necessary to rely on well-trained frontline employees with a focus on personal characteristics such as credibility, expertise, and persuasiveness. Furthermore, frontline employees should rely on personal skills to give customers the feeling of unselfish support with the intention to simplify customers' product choice.

Although some customers prefer to avoid a personal interaction with a frontline employee, retailers have the opportunity to provide specially created digital content by means of frontline

employees' expertise. Considered together with the findings obtained in Essay III, digital-mediated communication leads to higher source persuasiveness and recommendation adoption. In this manner, retailers can decrease customers' unfavorable perceptions of frontline employees by providing another communication channel.

As retailers think about reducing or even replacing frontline employees as an information source, future research is supposed to extend the findings of this thesis with the intention to examine further consequences of this radical change. However, customers' intention to use several information sources while searching in-store, future research should also examine the effects of multichannel usage in the context of information search. While the focus of this dissertation is to compare different communication channels and examine their effects separately, the knowledge about the effect of multiple communication channel searches on customers' decision-making processes is limited. In sum, this dissertation provides detailed insights into several aspects of customers' information search processing and purchase decisions against the background of comparing traditional offline and arising online information sources. Finally, the findings in this dissertation yield further interesting questions that need to be considered in future research.

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