# Dimensions of Retail Customer Experience and Its Outcomes: A Literature Review and Directions for Future Research

2 authors:

Anna Hermes
Johannes Kepler University Linz
**4** PUBLICATIONS   **3** CITATIONS

René Riedl
Fachhochschule Oberösterreich
**240** PUBLICATIONS   **3,275** CITATIONS

Some of the authors of this publication are also working on these related projects:

Project    Technostress View project

Project    Impact factors of content creation in social media marketing to generate user engagement View project

# Dimensions of Retail Customer Experience and Its Outcomes: A Literature Review and Directions for Future Research

Anna Hermes[1][0000-0001-7553-3459], and René Riedl[1,2]

[1]Johannes Kepler University Linz, Institute of Business Informatics–Information Engineering, Linz, Austria
anna.hermes@jku.at
[2] University of Applied Sciences Upper Austria, Steyr, Austria
rene.riedl@fh-steyr.at

**Abstract.** Due to changes in customers' shopping habits and increasing omni-channel behavior (i.e., use of both online and offline channels), a seamless customer experience (CX) with a retailer extends beyond the online shop. CX is a broad construct and researchers have used various measures to capture this construct. Consequently, it is difficult to compare CX outcomes. Against this background, this literature review analyzes CX dimensions, measures, and outcomes in a human-computer interaction context and beyond. Our results indicate that both affective and cognitive CX have been studied intensively. While affective CX has mostly been measured using the PAD (pleasure, arousal, dominance) scale, cognitive CX has largely been studied based on the flow concept. A few researchers have studied CX holistically, or as a social and sensorial phenomenon. Major outcomes studied in the extant literature include engagement, purchase intention, loyalty, commitment, word-of-mouth, satisfaction, and trust. Based on our findings, we discuss managerial implications as well as directions for future research.

**Keywords:** Customer Experience, Retail Environment, Literature Analysis

## 1    Introduction

How and where customers shop has fundamentally changed in the last decade [1]. Today customers can make use of an enormous offering of online and offline shopping channels, resulting in a fragmented customer journey [2]. Hence, it is important for retailers to provide a unified and integrated customer experience (CX) across different retail channels, referred to as an omnichannel experience [2, 3].

Beginning with the work of Holbrook and Hirschman [4], a rich body of research has found that not only logical reasoning and thought processes, but also emotions, can shape consumer behavior [5–7]. An influential definition by Lemon and Verhoef [2] described CX as "a multidimensional construct focusing on a customer's cognitive, emotional, behavioral, sensorial, and social responses to a firm's offerings during the

customer's entire purchase journey" (p. 71). Further, how a customer perceives a channel and makes the decision to buy strongly depends on individual psychological factors such as emotions and cognition [4, 5, 8–11]. As a result, researchers and practitioners alike have investigated how customers experience various channels and how these experiences affect company and marketing outcomes [2, 3]. It follows that while this paper focuses on human-computer interactions (HCI) on e-commerce websites, as well as mobile shopping apps, it is nowadays not reasonable to look at those channels in an isolated fashion (e.g., [12]). Thus, in this paper we review retail CX along with its measurements and outcomes from a cross-disciplinary view, also including non-HCI-channels.

Despite this large body of research and its growing importance, the literature on retail CX scales and outcomes of specific CX dimensions is still fragmented [13]. Previous literature reviews have focused on the determinants and antecedents of experiential value in general, but have not considered specific CX dimensions such as emotion and cognition [13]. Some researchers have also mainly focused on single retail channels such as online shopping [14] or retail store experiences [15]. Further, De Keyser et al. [11], Mahr et al. [16], and Becker and Jaakkola [17] conducted literature reviews including CX dimensions such as cognitive and sensorial CX. Yet, these papers did neither provide insights into specific CX scales used nor did these papers examine the relationship between specific CX dimensions and marketing outcomes.

In the current paper, we go beyond the existing insights in the literature and review a highly fragmented research field. Specifically, we (i) provide an overview of retail CX dimensions and scales in an HCI-context and beyond, and (ii) shed light on those dimensions of retail CX that have been found to influence specific marketing goals. Therefore, this study aims to synthesize CX dimensions and scales and their outcomes to then provide managerial implications that can help retailers enhance CX. We purposely reviewed findings from online as well as offline CX. In doing so we want to encourage e-commerce retailers and researchers to broaden their view on CX, considering the omnichannel perspective in which a customer crosses a wide range of company touchpoints, both online and offline. Finally, we propose future research directions. To achieve these goals, we conducted a systematic literature review based on the framework by vom Brocke et al. [18] to search for, identify, and analyze the relevant retail CX literature. This review included high-quality, peer-reviewed, English-language journal papers, and excluded papers that did not meet the defined quality criteria as well as conference papers and books. The guiding research questions for our literature review were as follows:

RQ1: Which dimensions and scales are used to measure CX?
RQ2: What are the outcomes of specific CX dimensions?

## 2 Literature Review Methodology

We used the literature review guidelines provided by vom Brocke et al. [18]. Figure 1 visualizes the search process. The scope of this literature review included empirical CX studies. We reviewed the used CX scales and methodologies as well as research

findings. This review is conceptualized as a neutral summary of relevant studies. Further, the scope of this research is the customer side of CX and its outcomes (e.g., a customer's satisfaction) rather than CX from a firm perspective (e.g., improvement of CX management and quality, see also [19]). To search relevant journals, we consulted the databases EBSCOhost and Web of Science. These databases contain a wide range of relevant research papers in the fields of business, information science, information systems, psychology, and marketing, among others. We used the search term ("customer experience*" AND "retail") to identify papers. The initial search queries returned a vast number of indexed articles (EBSCOhost and Web of Science returned a total of 5,160 hits). We then filtered for English-language, peer-reviewed journal articles published in 2007 or later. We chose 2007 due to the introduction of the iPhone, which prompted a major shift in smartphone technology that allowed for mobile shopping and made the Internet more accessible as a shopping channel. After removing duplicates, 312 papers matched our query (last accessed November 2020). In the first step, we reviewed the title and abstract of each paper to identify relevant literature. We eliminated a total of 56 papers that did not focus on retail shopping environments. For example, we excluded studies from the financial sector [20] because corresponding findings can hardly be compared with traditional shopping experiences (due to the high risk and security requirements involved). Further, 118 papers did not focus on CX in a retail context (e.g., studies focusing purely on product experiences). The focus of this paper is the customer side of CX (i.e., customers' perceptions during the shopping process). As such, we excluded 56 papers that focused on business processes, for example, business quality, customer relationship management, or innovation management. We included the top 400 journals in the fields of business, computer science, and psychology (according to the 2019 Scimago Institutions Rankings, sorted by journal rank indicator). A total of 26 articles did not meet this quality criterion and were thus eliminated.

At this stage, a total of 56 articles remained and were assessed for full-text eligibility. Since the scope of this study included only empirical studies, we eliminated nine conceptual papers, four literature reviews, and eight scale development papers. Of the 35 empirical papers, 13 had researched CX as a dependent variable or as a moderator and, hence, lacked findings on the outcomes of CX. Moreover, Khan et al.'s [21] study was excluded because they included service providers like travel agencies as well as restaurants, hence, did not purely focus on retailing. For the final set of 21 papers, we focused on CX measurements and their outcomes, reviewing the theoretical framework and findings sections. Six papers were published between 2012 and 2017, and 15 were published between 2018 and 2020. Seven papers used a mixed-methods approach (a combination of experiments and surveys), while 14 used surveys. The dominance of surveys is consistent with the results of previous literature reviews in the CX field (e.g., [11]).
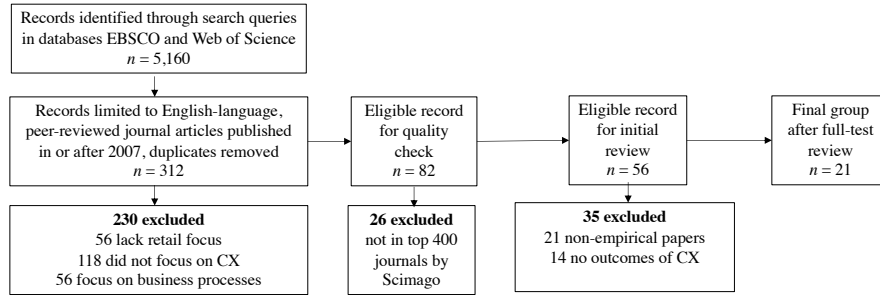
**Fig. 1.** Search strategy and selection process.

## 3 Findings

The next chapter gives an overview of CX scales that have been used to measure CX and CX dimensions and its outcomes. In line with our research questions, we included only direct relationships between CX and its outcomes (e.g., purchase intentions) in our analysis. This chapter concludes with the section *Summary of Major Results*, which answers RQ1 and RQ2. Figure 2 and Table 1 provide an overview of CX dimensions and their outcomes.
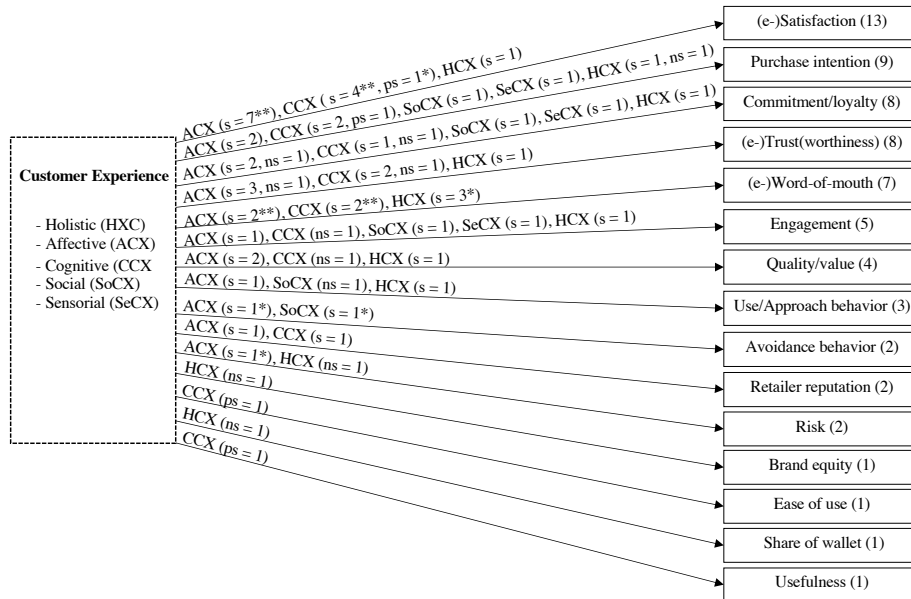


**Fig. 2.** Empirical findings regarding CX dimensions and their outcomes.
S = significant, ns = not significant, ps = partially significant (study count). *[22], [23], and [24] found negative relationships; **[25] found that negative CX positively influenced dissatisfaction and negative WOM, positive affective CX positively influenced satisfaction and positive WOM; all other findings identify positive CX and positive effects with the outcome.

**Holistic CX and Its Outcomes.** Eight papers considered CX as a holistic construct rather than measuring single CX dimensions. Krasonikolakis et al. [22] measured shopping CX through a combination of Mehrabian and Russell's [26] pleasure, arousal, and dominance (PAD) scale and Novak et al.'s [27] flow scale (for more information on PAD, please refer to the *Affective CX and Its Outcomes* section; the concept of flow is explained in the *Cognitive CX and Its Outcomes* section). In their experiment and survey ($n = 59$; Southern Europe), the researchers found that CX negatively influenced word-of-mouth (WOM) intentions in 3D online shops. Moreover, online shopping CX was not linked with purchase intention. McLean et al. [28] adapted Watson et al.'s [29] Positive and Negative Affect Schedule (PANAS) scale, which Kuhlthau [30] used to measure positive emotions, and combined it with a measurement of mobile shopping app satisfaction used by Song and Zinkhan [31]. They concluded that CX impacted how frequently customers used a retailer's mobile apps (survey; $n = 1,024$; UK). Terblanche [32] also considered satisfaction in his research of in-store CX and found that the internal shop environment and in-store emotions drove satisfaction (in-store survey and focus group; $n = 329$). Mohd-Ramly and Omar [33] measured CX using the brand experience scale by Brakus et al. [34] and concluded that CX positively influenced customer engagement (survey; $n = 484$; Malaysia). Applying a brand experience scale developed by Schmitt [35], Srivastava and Kaul [36] found a positive influence of CX on attitudinal and behavioral loyalty, yet no impact on a customer's spent (survey; $n = 840$; India).

Mainardes et al. [37] compared the scores of customers shopping at a single-branded store (they refer to it as "franchise customers") and customers who shop at multi-branded shops (in their reference "non-franchise customers") on Klaus and Maklan's [38] customer service experience (EXQ) scale (survey; $n = 1,097$; Brazil). The EXQ breaks CX down into four subcomponents: product experience; outcome focus (a goal-oriented experience); moments of truth (coping with service failure, service recovery); and peace of mind (customer's emotional benefits during and after the shopping encounter) [38]. For franchise customers, EXQ showed a significantly greater positive influence on the perceived product and service quality, brand trustworthiness, and purchase intention. However, no differences were found between the two groups in terms of the relationship between brand equity (i.e., the brand adding value for the customer) and perceived risk. Siqueira et al. [39] examined in-store CX (survey; $n = 390$; Colombia) and found that CX positively influenced online and offline WOM. This link was confirmed in a later study, where Siqueira et al. [40] found that CX positively influenced offline WOM behavior ($n = 293$; survey; Colombia).

**Affective CX and Its Outcomes.** As highlighted by Bleier et al. [41] "[c]ustomer interactions with products online can evoke affective responses and might be enjoyed for their own sake" (p. 99). Accordingly, the affective CX dimension focuses less on functional shopping perspectives, it rather highlights the customer's affective state or individual emotions when shopping [42]. A total of 12 papers considered affective CX. The preceding section presents the findings of Krasonikolakis et al. [22] (who combined PAD and flow), McLean et al. [28] (who combined the PANAS and satisfaction), and Terblanche [32] (who combined in-store emotions with in-store environments to

measure CX holistically). While we are aware of the distinct meanings of the terms "emotion," "affect," and "feeling" ([43]; see also [44]), most of the reviewed literature used these words interchangeably (nine papers considered affective CX, two papers considered emotional CX, and one paper considered single emotions). Five papers adopted Mehrabian and Russell's [26] PAD to measure affective CX. Moreover, two papers applied Voss et al.'s [45] hedonic dimension scale, and one paper used Watson et al.'s [29] PANAS. Lastly, four papers implemented additional scales to measure affective CX (see *Additional Scales* section in this chapter).

*PAD.* In our literature review, Rose et al. [42] were the first to use PAD to measure affective CX. Rose et al. [42] conducted a survey ($n = 220$; the US and Europe) and found that affective CX influenced a customer's online shopping satisfaction but not the level of trust in online shopping. Re-examining Rose et al.'s [42] research design, Martin et al. [24] surveyed 555 Australian online shoppers and concluded that affective CX influenced satisfaction positively, perceived risk negatively, and trust positively. Moreover, Molinillo et al. [46] surveyed 393 participants in Spain and found that a customer's affective CX with a retailer's app had a positive influence on their satisfaction and trust. Micu et al. [47] conducted an online survey ($n = 400$; 200 Tunisian, 200 Romanian) and found an impact of the customer's affective experiential state on perceived value, e-satisfaction, and e-trust. Lastly, Anninou and Foxall [23] found that a customer's level of pleasure positively determined the approach behavior of grocery and technology retail experiences. Further, customers' avoidance behaviors were negatively determined by high levels of pleasure and arousal (survey, $n = 260$, UK).

**Table 1.** Overview of studies, dimensions, and findings.
CX = Customer Experience; (e-)WOM = (electronic-)Word-of-Mouth; EXQ = Customer Service Experience; HED/UT = Hedonic / Utilitarian scale; PAD = Pleasure, Arousal, Dominance; PANAS = Positive and Negative Affect Schedule. Findings significant at least at $p > 0.05$, unless otherwise noted as not significant (ns), or partially significant (ps). *considers negative CX

| [Paper] Context (sorted alphabetically by author) | CX component | | | | | Scale | Outcome |
|---|---|---|---|---|---|---|---|
| | Holistic | Affect | Cognition | Social | Sensorial | | |
| [23] General | | x | | | | PAD | Approach (+), avoidance behavior (-) |
| | | | | x | | PAD | Approach (ns), avoidance behavior (-) |
| [25] Online* | | | x | | | HED/UT | Dissatisfaction (+), negative WOM (+) |
| | | x | | | | HED/UT | Dissatisfaction (+), negative WOM (+) |
| [41] Online | | | x | | | Informativeness | Purchase intention (+) |
| | | x | | | | Entertainment | Purchase intention (+) |
| | | | | x | | Social presence | Purchase intention (+) |
| | | | | | x | Sensory appeal | Purchase intention (+) |
| [48] General | | | x | | | Brand experience | Loyalty (+), retailer's reputation (+) |
| | | x | | | | Brand experience | Loyalty (+), retailer's reputation (+) |

*(Continued)*

**Table 1.** *(Continued).*

| [Paper] Context (sorted alphabetically by author) | CX component | | | | | Scale | Outcome |
|---|---|---|---|---|---|---|---|
| | **Holis-** | **Affect** | **Cogni-** | **Social** | **Sensorial** | | |
| [49] Store | | x | | | | PANAS | Hedonic value (+), Satisfaction (+) |
| [22] Online | x | | | | | PAD, flow | Purchase intention (ns), WOM (-) |
| [37] Store | x | | | | | EXQ | Single-brand store customers reported higher perceived quality (+), brand trustworthiness (+), purchase intention (+) (vs. multi-brand store customers); no difference found for perceived risk (ns) and perceived brand equity (ns) |
| [24] Online | | x | | | | PAD | Risk (-), trust (+), satisfaction (+) |
| | | | x | | | Flow | Satisfaction (-/ps, only for infrequent shoppers) |
| [28] Mobile | x | | | | | PANAS, satisfaction | Frequency of use (+) |
| [47] Online | | x | | | | PAD | Value (+), e-satisfaction (+), e-trust (+) |
| | | | x | | | Flow | Value (ns), e-satisfaction (+), e-trust (+) |
| [33] Store | x | | | | | Brand experience | Customer engagement (+) |
| [46] Mobile | | x | | | | PAD | Satisfaction (+), trust (+) |
| | | | x | | | Flow | Satisfaction (+), trust (+) |
| [50] Online | | x | | | | E-enjoyment | Satisfaction (+), loyalty (ns) |
| [42] Online | | x | | | | PAD | Satisfaction (+), trust (ns) |
| | | | x | | | Flow | Satisfaction (+), trust (ns) |
| [51] Online | | | x | | | Confirmation | Customer commitment (ns), customer engagement behavior (ns) |
| | | x | | | | HED/UT | Customer commitment (+), customer engagement behavior (+) |
| | | | | | x | Servicescape | Customer commitment (+), customer engagement behavior (+) |
| | | | | x | | Social | Customer commitment (+), customer engagement behavior (+) |
| [39] General | x | | | | | CX | WOM (+), eWOM (+) |
| [40] General | x | | | | | CX quality | WOM (+) |
| [36] Store | x | | | | | Brand experience | Attitudinal loyalty (+), behavioral loyalty (+), share of wallet (ns) |
| [32] Store | x | | | | | In-store emotions and environment | Satisfaction (+) |
| [52] Online and store | | | x | | | Brand experience | Repeat purchase intention (+), WOM (+) |
| | | x | | | | Brand experience | Repeat purchase intention (+), WOM (+) |
| [53] Online | | | x | | | Cognitive absorption | Purchase intention (+/ps), usefulness (+/ps), ease of use (+/ps) |
| Total | 8 | 12 | 10 | 3 | 2 | | |

*Hedonic Dimensions to Measure Consumer Attitudes.* Voss et al. [45] developed a hedonic and utilitarian scale to measure consumer attitudes. The hedonic scale measures affective customer involvement (e.g., having fun), while the utilitarian scale measures aspects such as functionality and helpfulness. Two papers applied the hedonic dimensions of this scale to measure affective CX. Barari et al. [25] investigated the influence of negative and positive online shopping encounters on affective CX (two experiments and surveys; study 1 $n = 201$, study 2 $n = 200$; USA). They found that customers with a negative affective experience showed higher engagement in negative WOM and were more likely to be dissatisfied. In addition, shoppers reported more positive affective experiences in a successful shopping encounter. Finally, a customer's affective experiences showed a greater influence on positive WOM in a successful online shopping encounter. Considering the effects of affective CX in in-store grocery shopping environments, Roy et al. [51] found that affective CX positively influenced customer commitment and engagement behavior (i.e., compliance, cooperation, helping other customers, and positive WOM; survey; $n = 187$; Australia).

*PANAS.* First developed by Watson et al. [29], the PANAS lists a total of 20 affective states (e.g., active, distressed) to measure positive and negative affect. Högberg et al. [49] applied Thompson's [54] version of the PANAS scale to measure only positive emotions (survey and field experiment; $n = 378$, Europe). The researchers found that people with higher positive affect (caused by gamified in-store elements) perceived higher hedonic value (i.e., more enjoyable interactions with the retailer) and gave higher ratings of the satisfying effects of rewards (e.g., a coupon).

*Additional Scales.* Bleier et al. [41] applied Hausman and Siekpe's [55] entertainment scale and found that entertainment (as affective CX) had the greatest influence on purchase intention (experiment and survey; $n = 10,470$). Affective CX was especially important if a product was best to be physically experienced ("experience product") or if the brand was perceived to be less trustworthy. Additionally, Foroudi et al. [48] measured affective CX with a brand experience scale designed by Dennis et al. [56] (survey; $n = 606$; UK). The findings revealed that affective CX influenced loyalty as well as the customer's perception of the retailer's reputation. Additionally, Tyrväinen et al. [52] applied Brakus et al.'s [34] affective brand experience scale to measure affect in omni-channel CX (survey; $n = 4,418$; Sweden and Finland). The researchers found a positive effect on WOM and repeat purchase intentions in online and in-store environments. Pandey and Chawla [50] found that customers who enjoyed online shopping showed a higher level of satisfaction (two surveys; study 1 $n = 217$, study 2 $n = 615$; India). In addition to enjoyment, the researchers included other factors to measure CX (e.g., logistic ease); however, to report all factors would be outside the scope of this review.

**Cognitive CX and Its Outcomes.** The cognitive CX dimension highlights the website or in-store capabilities in supporting customers during their pending purchase decisions, as such, it concerns a customer's mental processing and thought processes [8, 41]. Various papers measured cognitive CX (total of 10), frequently using the flow

construct (four papers) but also through a range of other scales (six papers; for details, see the *Additional Scales* section of this chapter).

*Flow.* Novak et al. [27] further shaped this field of research, which was first introduced by Csikszentmihalyi [57], and described flow as the state in which a customer is so involved in a task that their thoughts and perceptions are irrelevant and/or screened out. In our review, Rose et al. [42] were the first to measure cognitive CX using the concept of flow. They found that flow could impact the degree of a customer's satisfaction but did not influence trust in online shopping. Molinillo et al. [46] concluded that experiencing flow while using a retailer's app influenced both customer satisfaction and trust in the app. Additionally, Martin et al. [24] found that flow negatively influenced online shopping satisfaction for infrequent shoppers. Micu et al. [47], further found that cognitive experiential flow states positively impacted e-satisfaction and e-trust but did not influence the perceived customer value.

*Additional Scales.* In a study examining negative CX, Barari et al. [25] applied Voss et al.'s [45] utilitarian scale to measure cognitive CX. They found that customers who had a negative cognitive experience due to retailer failure were more likely to be dissatisfied and to engage in negative WOM. Moreover, when comparing affective and cognitive CX, the latter showed a greater impact on the degree of a customer's dissatisfaction in an unsuccessful online shopping encounter. Further, cognitive CX (measured using the informativeness scale developed by Luo [58]) significantly influenced purchase intention in a study by Bleier et. al [41]. This effect was strongest if a brand was perceived to be trustworthy as well as for "search products" (i.e., those evaluated based on hard facts, rather than by physical touch).

Roy et al. [51] applied Bhattacherjee's [59] confirmation scale to measure cognitive CX. Their results indicated that neither customer commitment nor customer engagement behavior was influenced by a customer's cognitive CX. Foroudi et al. [48] found that intellectual CX (measured via Dennis et al.'s [56] intellectual brand experience scale) modified loyalty and retailer reputation. Lastly, Visinescu et al. [53] compared 2D and 3D web designs and used Agarwal and Karahanna's [60] cognitive absorption scale which includes various factors, namely curiosity, temporal dissociation, focused immersion, and heightened enjoyment (experiment and survey; $n = 348$; US). The researchers found several implications, e.g., for customers with previous online shopping experiences, curiosity, temporal dissociation, and focused immersion positively influenced purchase intention. However, for customers without previous online shopping experiences, heightened enjoyment showed a positive effect on a customer's purchase intention. Temporal dissociation influenced perceived usefulness for experienced customers, while curiosity and heightened enjoyment influenced perceived usefulness for inexperienced customers. Moreover, temporal dissociation, curiosity, and heightened enjoyment influenced perceived ease of use. Lastly, Tyrväinen et al. [52] applied Brakus et al.'s [34] cognitive brand experience scale and found a positive direct effect of cognitive CX on WOM and repeat purchase intentions.

**Social CX and Its Outcomes.** Three papers considered social CX and its outcomes. Social CX refers to a CX element—for example, on a website—that creates a socially connected and warm feeling which allows customers to connect with retailers on a human level [41, 61]. A study by Bleier et al. [41] found that social CX significantly influenced purchase intentions, yet its effect was weaker than that of affective or cognitive CX. Applying Reimer and Kuehn's [62] Servicescape to measure social CX, Roy et al. [51] found that social CX impacted a customer's commitment and engagement. Lastly, Anninou and Foxall [23] used PAD to measure social CX (for thematic reasons, these findings are presented in section *Affective CX and its Outcomes* under PAD).

**Sensory CX and Its Outcomes.** Two papers considered sensory CX and its outcomes. Sensory CX includes CX elements that can stimulate a customer's senses, such as smell, touch, taste, or sight [8, 41]. Bleier et al. [41] found that, although sensory appeal significantly influenced purchase intention in online shopping, yet other CX dimensions (e.g., affective, cognitive, and social CX) had a greater influence on purchase intention. Further, Roy et al. [51] concluded that there was a relationship between customers' sensory CX and their commitment and engagement behavior.

**CX Dimensions in HCI Contexts and Beyond.** The majority of the reviewed studies researched CX in a HCI context (nine papers researched online CX [22, 24, 25, 41, 47, 50, 51, 53, 63] and two studies mobile CX [28, 46]). Moreover, five studies were conducted in in-store shopping settings [32, 33, 36, 37, 49]. One paper researched online and in-store omnichannel experiences [52]. Lastly, four papers examined CX with regard to shopping or retailers in general without focusing on a particular channel [23, 39, 40, 48]. In summary, we found that PAD was used to measure CX across all channels. However, brand experience scales and the PANAS were mainly used to measure in-store experiences or general retailer and brand experiences. In particular, the flow scale was applied in an HCI context to measure CX with online shops or mobile apps. In addition to these scales, a wide range of additional scales has been used to measure dimensions such as cognitive absorption, informativeness, entertainment, or enjoyment. In an online and mobile context, three studies examined relationships between the CX dimensions of affective and cognitive CX. Rose et al. [42] found that the affective CX of online shoppers influenced their cognitive experiential state, and Molinillo et al. [46] found that affective CX positively influenced cognitive CX. Moreover, Barari et al. [25] found that when the shopping experience was positive, affective CX showed a greater impact on positive WOM as well as satisfaction than cognitive CX.

**Summary of Major Results.** Regarding RQ1 ("Which dimensions and scales are used to measure CX?") we summarize the findings as follows: Most of the reviewed studies (12 papers) researched affective CX and its outcomes, followed by cognitive CX (10 papers), holistic CX (eight papers), social CX (three papers), and sensory CX (two papers). The dominance of emotion research in the CX community is consistent with the findings of other researchers (e.g., [11]). Additionally, eight papers combined established scales such as PAD, flow scales, or the PANAS to measure CX holistically. The

12 papers that measured affective CX mostly used PAD. Researchers also used the PANAS or hedonic measurements such as entertainment or enjoyment to measure affective CX. With regard to cognitive CX, a total of 10 papers applied the flow concept or scales that measured utilitarian dimensions such as informativeness or cognitive absorption. Three papers also measured social CX through, for example, social presence or the Servicescape scale. Additionally, two papers measured sensory CX (e.g., through measuring sensory appeal; see Table 1 for an overview of all scales used).

Regarding RQ2 ("What are the outcomes of specific CX dimensions?") we summarize the findings as follows: Researchers have not only found that holistic CX can influence marketing outcomes such as (e-)satisfaction and purchase intention. Rather, especially affective CX is highly researched and has been found to impact outcomes such as (e-)satisfaction, perceptions of product quality and shopping value, purchase intention, loyalty/commitment, (e-)trust, and (e-)WOM. Further, cognitive CX influences customers' level of (e-)satisfaction, perceived ease of use and usefulness, purchase intentions, commitment/loyalty, (e-)trust, and (e-)WOM. In our review, social CX and sensorial CX were researched the least. Both social CX and sensorial CX affected purchase intention, commitment/loyalty, and engagement. Additionally, social CX influenced customers' shopping approach behavior (see Figure 2 and Table 1 for an overview of all CX dimensions and their outcomes). We conclude that some CX dimensions (e.g., affective CX), as well as some outcomes (e.g., satisfaction, loyalty/commitment, and purchase intention) have been heavily researched, but others have hardly been investigated (e.g., CX and its influences on actual money spent). Finally, some researchers have concluded that affective CX can influence cognitive CX and that affective CX in general shows a stronger influence on, for example, satisfaction and purchase intention [24, 41, 42].

## 4 Research Agenda & Managerial Implications

This section presents a detailed research agenda to advance the current understanding of CX. By framing the research agenda to reflect the unanswered research questions and underrepresented topics (as identified in the literature review), the structure herein presents three major domains: (1) examination of future moderators in the CX–outcome relationship; (2) study of additional CX outcomes; and (3) integration of Neuro-Information-Systems (NeuroIS) methods with traditional CX methods and a comparison of the findings. Figure 3 presents an overview of possible future research actions. Additionally, we provide managerial implications based on the review's findings.

**Examination of Future Moderators in the CX–Outcome Relationship.** This paper highlights the importance of emotions in CX research. However, although affective CX has already been heavily researched, we still see research opportunities concerning this dimension of CX. Researchers have argued that there are two types of emotions: incidental (task-unrelated) and integral (task-related) [64]. While the reviewed papers considered outcomes of integral emotions (e.g., measurements of enjoyment of a shopping

process), we call future researchers to examine how CX is influenced by incidental emotions. Incidental emotions are affected by a customer's personality and may influence consumer decision-making [9]. Hence, we encourage future researchers to consider the role that personality may play in influencing affective CX and its outcomes, as measured by scales like Costa and McCrae's [65] Big Five, HEXACO (e.g., [66]), or Davis et al.'s [67] Affective Neuroscience Personality Scale (ANPS). Further, more research is needed to examine moderating effects from channel-specific factors (e.g., channel type, store environment). Each shopping channel has certain advantages and potentials; for example, trust is an important factor in online shopping [68]. Hence, the effects of CX on its outcomes might vary depending on the channel a customer is using. Additionally, other personal factors (e.g., goals, mood) might influence the relationship between CX and its outcomes.

**Study of Additional Outcomes of CX.** While some factors, such as satisfaction (e.g., [24, 32, 42, 47]) and purchase intention (e.g., [22, 37, 41]), have been highly researched as outcomes of CX, other outcomes were hardly or not at all examined in the extant literature, including perceived usefulness, perceived ease of use, attention, time spent shopping, brand awareness, and retailer or channel preferences. Examining these outcomes could thus be a fruitful addition to the current CX literature. In addition, it is valuable to learn more about the relationship between different CX dimensions and actual money spent, especially from a company's point of view. Surprisingly, Srivastava and Kaul [36] did not find a relationship between holistic CX and customer spending, although other researchers have found evidence that CX can impact various customer behaviors such as purchase intention (e.g., [41]) and shopping approach behavior (e.g., [23]). As such, we call for future research examining CX and its dimensions and their impact on actual sales data. Further, most of the reviewed studies researched online environments, with only one comparing the outcomes of CX across multiple channels. Accordingly, we call for additional research examining more than one channel and comparing CX in different channels.

**Integration of NeuroIS Methods With Traditional CX Methods.** Researchers have claimed that the field lacks a strong and robust scale to measure CX [2]. In a very recent paper, De Keyser et al. [11] concluded that "[i]t is time to move beyond the dominant focus on survey research" (p. 447). This is consistent with the finding of this review that there is no one dominant scale directly measuring CX. It follows that the CX research community has begun to use established scales such as PAD and the PANAS or the concept of flow. While PAD has been highly researched in this context, we still see research opportunities for other scales. The PANAS, for example, has only been used to measure the impact of positive affective CX on customers' value perceptions, satisfaction, and frequency of usage of mobile shopping apps. Future researchers could use the PANAS to measure both positive and negative affective CX and its influences. Additionally, Roy et al. [51] did not find a significant effect of cognitive CX on customer engagement. While they measured cognitive CX using Bhattacherjee's [59] confirmation scale, future researchers could reexamine this relationship—for example,

measuring cognitive CX using flow. Moreover, HCI researchers might consider scales that seem to be typically used to measure in-store CX, such as brand-experience scales.

Moreover, all reviewed papers used structured questionnaires to measure CX. However, there has been a longstanding discussion in research regarding how to accurately measure emotions that are felt in the body through cognitive processes such as questioning or other self-report methods [43]. As Caruelle et al. [69] have also pointed out, the use of self-reports to measure consumer emotions can pose various risks, including biased data due to respondents' unwillingness or inability to correctly identify, capture, and communicate their own emotions. Hence, using a self-report methodology to measure consumer emotions and affective states, in general, can have various pitfalls.

An alternative to self-report methods in consumer research can be found in the field of NeuroIS research (e.g., [70]). This field of research applies neuroscience theories and tools to measure neurophysiological responses in the context of information systems (IS) research [71]. NeuroIS research has been expanded from pure IS research to other areas, such as customer behaviors in HCI contexts (e.g., [72]; for an overview, see [70]). Researchers have also specifically called for the expansion of NeuroIS research into the realm of emotions research [44]. While a handful of studies have used NeuroIS tools to research customer emotions in general, there is a growing need for additional insights from future research [69, 73, 74]. Studies applying neurophysiological methods in the context of CX are still scarce, and researchers have made an explicit call to advance research in this realm [2, 11, 75]. Hence, we encourage researchers to apply NeuroIS tools (e.g., measurements of skin conductance, facial expression recognition, eye-tracking) to identify different dimensions of CX during a shopping encounter [71]. A possible RQ could involve how affective CX can be measured using tools such as facial expression recognition and how cognitive CX can be measured with NeuroIS tools that examine cognitive load (e.g., EEG [76]). Moreover, HCI researchers have called for a comparison of findings from traditional self-report methods, such as surveys, with findings from studies employing NeuroIS tools [44]. Since various studies have already examined CX and its outcomes through self-report methods, researchers could compare findings from "traditional studies" (e.g., CX effects on purchase intention, or satisfaction) with findings from studies with NeuroIS methods. Against this background, we call for more research comparing results from studies applying various methods (including NeuroIS tools) with those from traditional methods (i.e., surveys).

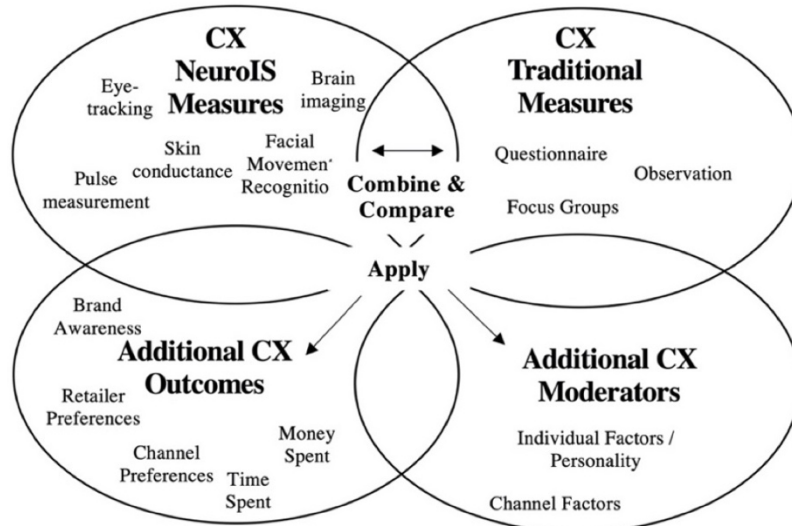Figure 3 provides an overview of possible future research areas.

14



**Fig. 3.** Possible future research areas.

**Summary of Future Research Directions.** Based on the insights from our review and the discussion in this chapter, we broadly formulated future research opportunities. The following research questions were identified (see also Figure 3):

- Additional CX Moderators: How do incidental (task-unrelated) emotions, as well as a customer's personality, influence the relationship between CX and its outcomes? How do channel-specific, or individual factors (e.g., mood, shopping goals) influence the relationship between CX and its outcomes?
- Additional CX Outcomes: What is the influence of single CX dimensions on less researched CX outcomes (e.g., the influence of cognitive CX on risk; the influence of affective CX on ease of use and perceived usefulness)? What is the influence of less or not yet examined CX outcomes such as retailer and channel preference, brand awareness, and actual money or time spent? How can the CX of different channels be compared (e.g., online vs. mobile vs. in-store)? How does the effect on CX outcomes depend and differ based on the method used to measure CX?
- Measurement of CX: Which self-report scales are best suited to examine the various dimensions of CX? How can self-report and neurophysiological methods be combined or compared to measure CX?

**Managerial Implications.** This paper provided an overview of the various CX dimensions and their measurements and outcomes. These findings are important for a company's CX researchers and digital retail professionals. First, we reviewed possible CX measurements and offered suggestions for future CX research, such as the use of NeuroIS tools. This information can be used by CX or marketing professionals to plan, conduct, and interpret their CX studies. Further, we provided an overview of the

possible outcomes of CX. We documented that affective CX, in particular, has been heavily researched and has an overarching impact on marketing outcomes such as satisfaction and purchase intention. Hence, retailers are advised to emphasize differentiating and managing customer emotions in their retailing environments (see also [77]).

## 5     Conclusion

This study presented a systematic literature review with a focus on CX scales, as well as CX dimensions and its outcomes, and made several contributions. First, it added to the knowledge on dimensions of CX and its measurements. We want to encourage HCI researchers to consider CX beyond online shopping environments and mobile websites, and hence we reviewed HCI *and* in-store CX studies in a cross-disciplinary manner. We found that affective CX in particular—but also cognitive, social, and sensory CX— has been considered when measuring CX. Additionally, researchers can consider CX holistically, without identifying specific dimensions. Further, this research revealed that in our sample only self-report measures have been used to measure CX. Some researchers have used established measurements such as PAD, the PANAS, or the flow scale, while others have used CX-specific scales such as the EXQ or various brand experience scales. Consistent with previous researchers, such as Lemon and Verhoef [2], we thus conclude that there is no one CX scale; rather, different researchers have applied different measures. Understanding the wide range of CX dimensions and scales can help researchers and retail managers to interpret their CX studies as well as those conducted by other researchers.

Second, due to the extremely broad measurements of CX, it is difficult to draw conclusions regarding specific outcomes of CX. Hence, we provided an overview of outcomes organized by each CX dimension. While some outcomes have been researched for various dimensions (especially customer engagement, purchase intention, loyalty, commitment, (e-)WOM, satisfaction, and trust, see Table 1 for an overview), others have yet to be further explored. This overview can help academic researchers obtain an overview of possible research gaps. Practitioners can achieve valuable insights into which CX dimensions (e.g., affect) showed an effect on marketing goals such as satisfaction or purchase intention. However, generalizations should be drawn with caution. The vast amount of CX scales that are used to measure each CX dimension might also affect CX outcomes, hence, it might be useful to also consider the CX scale when interpreting outcomes of specific CX dimensions.

The limitations of this study are mostly related to the review and categorization processes. Although we believe that the findings of this paper are comprehensive, it cannot be completely ruled out that relevant papers on CX and its outcomes using different keywords were not identified and hence not considered. To increase validity, we used particularly broad keywords to secure a large pool of possible papers. Additionally, in line with the research question, we purposely only searched for papers with a CX customer focus (e.g., not a business process perspective). We also focused on the retail context and eliminated papers from (for example) the finance sector. Despite these limitations, however, this literature review comprises a wide variety of retail CX literature

and highlights its outcomes for academia and marketing professionals alike. It is hoped that the present review will prompt future studies in this important domain.

## Acknowledgments

## References

1.  Verhoef, P.C., Kannan, P.K., Inman, J.J.: From Multi-Channel Retailing to Omni-Channel Retailing. J. Retail. 91, 174–181 (2015).
2.  Lemon, K.N., Verhoef, P.C.: Understanding Customer Experience Throughout the Customer Journey. J. Mark. 80, 69–96 (2016).
3.  von Briel, F.: The future of omnichannel retail: A four-stage Delphi study. Technol. Forecast. Soc. Chang. 132, 217–229 (2018).
4.  Holbrook, M.B., Hirschman, E.C.: The Experiential Aspects of Consumption: Consumer Fantasies, Feelings, and Fun. J. Consum. Res. 9, 132–140 (1982).
5.  Laros, F.J.M., Steenkamp, J.B.E.M.: Emotions in consumer behavior: a hierarchical approach. J. Bus. Res. 58, 1437–1445 (2005).
6.  Richins, M.L.: Measuring Emotions in the Consumption Experience. J. Consum. Res. 24, 127–146 (1997).
7.  Babin, B.J., Darden, W.R., Griffin, M.: Work and/or Fun: Measuring Hedonic and Utilitarian shopping value. J. Consum. Res. 20, 644–656 (1994).
8.  Gentile, C., Spiller, N., Noci, G.: How to Sustain the Customer Experience: An Overview of Experience Components that Co-create Value With the Customer. Eur. Manag. J. 25, 395–410 (2007).
9.  Achar, C., So, J., Agrawal, N., Duhachek, A.: What we feel and why we buy: The influence of emotions on consumer decision-making. Curr. Opin. Psychol. 10, 166–170 (2016).
10. Puccinelli, N.M., Goodstein, R.C., Grewal, D., Price, R., Raghubir, P., Stewart, D.: Customer Experience Management in Retailing: Understanding the Buying Process. J. Retail. 85, 15–30 (2009).
11. De Keyser, A., Verleye, K., Lemon, K.N., Keiningham, T.L., Klaus, P.: Moving the Customer Experience Field Forward: Introducing the Touchpoints, Context, Qualities (TCQ) Nomenclature. J. Serv. Res. 23, 433–455 (2020).
12. Petre, M., Minocha, S., Roberts, D.: Usability beyond the website: An empirically-grounded e-commerce evaluation instrument for the total customer experience. Behav. Inf. Technol. 25, 189–203 (2006).
13. Varshneya, G., Das, G., Khare, A.: Experiential value: a review and future research directions. Mark. Intell. Plan. 35, 339–357 (2017).
14. Izogo, E.E., Jayawardhena, C.: Online shopping experience in an emerging e-retailing market: Towards a conceptual model. J. Consum. Behav. 17, 379–392 (2018).
15. Sachdeva, I., Goel, S.: Retail store environment and customer experience: a paradigm. J. Fash. Mark. Manag. 19, 290–298 (2015).
16. Mahr, D., Stead, S., Odekerken-Schröder, G.: Making sense of customer service

experiences: a text mining review. J. Serv. Mark. 33, 88–103 (2019).

17. Becker, L., Jaakkola, E.: Customer experience: fundamental premises and implications for research. J. Acad. Mark. Sci. 48, 630–648 (2020).

18. vom Brocke, J., Simons, A., Niehaves, B., Niehaves, B., Reimer, K.: Reconstructing the Giant: On the Importance of Rigour in Documenting the Literature Search Process. In: Proceedings of the European Conference on Information Systems (ECIS). pp. 2206–2217. Academic Conferences International Limited, Reading, UK (2009).

19. Kranzbühler, A.-M., Kleijnen, M.H.P., Morgan, R.E., Teerling, M.: The Multilevel Nature of Customer Experience Research: An Integrative Review and Research Agenda. Int. J. Manag. Rev. 20, 433–456 (2018).

20. Yoon, H.S., Barker Steege, L.M.: Development of a quantitative model of the impact of customers' personality and perceptions on Internet banking use. Comput. Human Behav. 29, 1133–1141 (2013).

21. Khan, I., Hollebeek, L.D., Fatma, M., Islam, J.U., Riivits-Arkonsuo, I.: Customer experience and commitment in retailing: Does customer age matter? J. Retail. Consum. Serv. 57, 102219 (2020).

22. Krasonikolakis, I., Vrechopoulos, A., Pouloudi, A., Dimitriadis, S.: Store layout effects on consumer behavior in 3D online stores. Eur. J. Mark. 52, 1223–1256 (2018).

23. Anninou, I., Foxall, G.R.: The reinforcing and aversive consequences of customer experience. The role of consumer confusion. J. Retail. Consum. Serv. 51, 139–151 (2019).

24. Martin, J., Mortimer, G., Andrews, L.: Re-examining online customer experience to include purchase frequency and perceived risk. J. Retail. Consum. Serv. 25, 81–95 (2015).

25. Barari, M., Ross, M., Surachartkumtonkun, J.: Negative and positive customer shopping experience in an online context. J. Retail. Consum. Serv. 53, 101985 (2020).

26. Mehrabian, A., Russell, J.A.: An approach to environmental psychology. The MIT Press, Cambridge, MA, US (1974).

27. Novak, T.P., Hoffman, D.L., Yung, Y.-F.: Measuring the Customer Experience in Online Environments: A Structural Modeling Approach. Mark. Sci. 19, 22–42 (2000).

28. McLean, G., Al-Nabhani, K., Wilson, A.: Developing a Mobile Applications Customer Experience Model (MACE)- Implications for Retailers. J. Bus. Res. 85, 325–336 (2018).

29. Watson, D., Clark, L.A., Tellegen, A.: Development and Validation of Brief Measures of Positive and Negative Affect: The PANAS Scales. J. Pers. Soc. Psychol. 54, 1063–1070 (1988).

30. Kuhlthau, C.C.: Seeking meaning: A process approach to library and information services. Libraries Limited, Westport, Conn. (2004).

31. Song, J.H., Zinkhan, G.M.: Determinants of Perceived Web Site Interactivity. J. Mark. 72, 99–113 (2008).

32. Terblanche, N.S.: Revisiting the supermarket in-store customer shopping experience. J. Retail. Consum. Serv. 40, 48–59 (2018).

33. Mohd-Ramly, S., Omar, N.A.: Exploring the influence of store attributes on customer experience and customer engagement. Int. J. Retail Distrib. Manag. 45, 1138–1158 (2017).

34. Brakus, J.J., Schmitt, B.H., Zarantonello, L.: Brand Experience: What Is It? How Is It Measured? Does It Affect Loyalty? J. Mark. 73, 52–68 (2009).

35. Schmitt, B.: Experiential Marketing. J. Mark. Manag. 15, 53–67 (1999).

36. Srivastava, M., Kaul, D.: Exploring the link between customer experience-loyalty-consumer spend. J. Retail. Consum. Serv. 31, 277–286 (2016).

37. Mainardes, E.W., Gomes, V.C.A., Marchiori, D., Correa, L.E., Guss, V.: Consequences of customer experience quality on franchises and non-franchises models. Int. J. Retail Distrib. Manag. 47, 311–330 (2019).

38. Klaus, P., Maklan, S.: EXQ: a multiple-item scale for assessing service experience. J. Serv. Manag. 23, 5–33 (2012).

39. Siqueira, J.R., Peña, N.G., ter Horst, E., Molina, G.: Spreading the Word: How Customer Experience in a Traditional Retail Setting Influences Consumer Traditional and Electronic Word-of-mouth Intention. Electron. Commer. Res. Appl. 37, 100870 (2019).
40. Siqueira, J.R., ter Horst, E., Molina, G., Losada, M., Mateus, M.A.: A Bayesian examination of the relationship of internal and external touchpoints in the customer experience process across various service environments. J. Retail. Consum. Serv. 53, 102009 (2020).
41. Bleier, A., Harmeling, C.M., Palmatier, R.W.: Creating Effective Online Customer Experiences. J. Mark. 83, 98–119 (2019).
42. Rose, S., Clark, M., Samouel, P., Hair, N.: Online Customer Experience in e-Retailing: An empirical model of Antecedents and Outcomes. J. Retail. 88, 308–322 (2012).
43. Walla, P.: Affective Processing Guides Behavior and Emotions Communicate Feelings: Towards a Guideline for the NeuroIS Community. In: Davis, F.D., Riedl, R., Vom Brocke, J., Léger, P.-M., and Randolph, A. (eds.) Information Systems and Neuroscience. Lecture Notes in Information Systems and Organisation. pp. 141–150. Springer, Cham, Switzerland (2018).
44. vom Brocke, J., Hevner, A., Léger, P.M., Walla, P., Riedl, R.: Advancing a NeuroIS research agenda with four areas of societal contributions. Eur. J. Inf. Syst. 29, 9–24 (2020).
45. Voss, K.E., Spangenberg, E.R., Grohmann, B.: Measuring the Hedonic and Utilitarian Dimensions of Consumer Attitude. J. Mark. Res. 40, 310–320 (2003).
46. Molinillo, S., Navarro-García, A., Anaya-Sánchez, R., Japutra, A.: The impact of affective and cognitive app experiences on loyalty towards retailers. J. Retail. Consum. Serv. 54, 101948 (2020).
47. Micu, A.E., Bouzaabia, O., Bouzaabia, R., Micu, A., Capatina, A.: Online customer experience in e-retailing: implications for web entrepreneurship. Int. Entrep. Manag. J. 15, 651–675 (2019).
48. Foroudi, P., Jin, Z., Gupta, S., Melewar, T.C., Foroudi, M.M.: Influence of innovation capability and customer experience on reputation and loyalty. J. Bus. Res. 69, 4882–4889 (2016).
49. Högberg, J., Ramberg, M.O., Gustafsson, A., Wästlund, E.: Creating brand engagement through in-store gamified customer experiences. J. Retail. Consum. Serv. 50, 122–130 (2019).
50. Pandey, S., Chawla, D.: Online customer experience (OCE) in clothing e-retail. Int. J. Retail Distrib. Manag. 46, 323–346 (2018).
51. Roy, S.K., Gruner, R.L., Guo, J.: Exploring customer experience, commitment, and engagement behaviours. J. Strateg. Mark. 1–24 (2020).
52. Tyrväinen, O., Karjaluoto, H., Saarijärvi, H.: Personalization and hedonic motivation in creating customer experiences and loyalty in omnichannel retail. J. Retail. Consum. Serv. 57, 102233 (2020).
53. Visinescu, L.L., Sidorova, A., Jones, M.C., Prybutok, V.R.: The influence of website dimensionality on customer experiences, perceptions and behavioral intentions: An exploration of 2D vs. 3D web design. Inf. Manag. 52, 1–17 (2015).
54. Thompson, E.R.: Development and validation of an internationally reliable short-form of the Positive and Negative Affect Schedule (PANAS). J. Cross. Cult. Psychol. 38, 227–242 (2007).
55. Hausman, A. V., Siekpe, J.S.: The effect of web interface features on consumer online purchase intentions. J. Bus. Res. 62, 5–13 (2009).
56. Dennis, C., Joško Brakus, J., Gupta, S., Alamanos, E.: The effect of digital signage on shoppers' behavior: The role of the evoked experience. J. Bus. Res. 67, 2250–2257 (2014).
57. Csikszentmihalyi, M.: Beyond Boredom and Anxiety. Jossey-Bass, San Francisco, CA, USA (1975).
58. Luo, X.: Uses and Gratifications Theory and E-Consumer Behaviors: A Structural

Equation Modeling Study. J. Interact. Advert. 2, 34–41 (2002).

59. Bhattacherjee, A.: Understanding Information Systems Continuance: An Expectation-Confirmation Model. MIS Q. 25, 351–370 (2001).

60. Agarwal, R., Karahanna, E.: Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. MIS Q. 24, 665–694 (2000).

61. Gefen, D., Straub, D.: Managing User Trust in B2C e-Services. e-Service J. 2, 7–24 (2003).

62. Reimer, A., Kuehn, R.: The impact of servicescape on quality perception. Eur. J. Mark. 39, 785–808 (2005).

63. Novak, T.P., Hoffman, D.L., Duhachek, A.: The Influence of Goal-Directed and Experiential Activities on Online Flow Experiences. J. Consum. Psychol. 13, 3–16 (2004).

64. Pham, M.T.: Emotion and Rationality: A Critical Review and Interpretation of Empirical Evidence. Rev. Gen. Psychol. 11, 155–178 (2007).

65. Costa, P.T., McCrae, R.R.: Normal Personality Assessment in Clinical Practice: The NEO Personality Inventory. Psychol. Assess. 4, 5–13 (1992).

66. Lee, K., Ashton, M.C.: Psychometric Properties of the HEXACO-100. Assessment. 25, 543–556 (2018).

67. Davis, K.L., Panksepp, J., Normansell, L.: The Affective Neuroscience Personality Scales: Normative Data and Implications. Neuropsychoanalysis. 5, 57–69 (2003).

68. Gefen, D.: E-commerce: The role of familiarity and trust. Omega. 28, 725–737 (2000).

69. Caruelle, D., Gustafsson, A., Shams, P., Lervik-Olsen, L.: The use of electrodermal activity (EDA) measurement to understand consumer emotions – A literature review and a call for action. J. Bus. Res. 104, 146–160 (2019).

70. Verhulst, N., De Keyser, A., Gustafsson, A., Shams, P., Van Vaerenbergh, Y.: Neuroscience in service research: an overview and discussion of its possibilities. J. Serv. Manag. 30, 621–649 (2019).

71. Riedl, R., Léger, P.-M.: Fundamentals of NeuroIS – Information Systems and the Brain. Springer, Berlin et al. (2016).

72. Veilleux, M., Sénécal, S., Demolin, B., Bouvier, F., Di Fabio, M.-L., Coursaris, C., Léger, P.-M.: Visualizing a User's Cognitive and Emotional Journeys: A Fintech Case. In: Marcus, A. and Rosenzweig, E. (eds.) Design, User Experience, and Usability. Interaction Design. HCII 2020. Lecture Notes in Computer Science. pp. 549–566. Springer, Cham, Switzerland (2020).

73. Hermes, A., Riedl, R.: The Nature of Customer Experience and its Determinants in the Retail Context: Literature Review. In: Gronau, N., Heine, M., Krasnova, H., and Pousttchi, K. (eds) WI2020 Zentrale Tracks. pp. 1738–1749. GITO Verlag, Potsdam, Germany (2020).

74. Hermes, A., Riedl, R.: How to Measure Customers' Emotional Experience? A Short Review of Current Methods and a Call for Neurophysiological Approaches. In: Davis, F., Riedl, R., Brocke, J. vom, Léger, P.-M., Randolph, A., and Fischer, T. (eds.) Lecture Notes in Information Systems and Organisation - Information Systems and Neuroscience. NeuroIS Retreat 2020. pp. 211–219. Springer, Cham, Switzerland (2020).

75. Phelps, E.A.: Emotion and Cognition: Insights from Studies of the Human Amygdala. Annu. Rev. Psychol. 57, 27–53 (2006).

76. Müller-Putz, G.R., Riedl, R., Wriessnegger, S.C.: Electroencephalography (EEG) as a Research Tool in the Information Systems Discipline: Foundations, Measurement, and Applications. Commun. Assoc. Inf. Syst. Vol. 37, 911–948 (2015).

77. Kim, S., Park, G., Lee, Y., Choi, S.: Customer emotions and their triggers in luxury retail: Understanding the effects of customer emotions before and after entering a luxury shop. J. Bus. Res. 69, 5809–5818 (2016).