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Technology-enabled personalization in retail stores: Understanding drivers and barriers

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ABSTRACT

Smart technologies grant brick-and-mortar retailers novel opportunities to introduce the amenities of online retailing, such as data-driven personalization, into physical interactions. Research on consumer reactions to the novel phenomenon of technology-enabled personalization (TEP) in retail stores is scarce though, so the current article proposes a conceptualization that demarcates TEP from broader notions of personalization. Qualitative data from 25 in-depth consumer interviews reveal five drivers (utilitarian, hedonic, control, interaction, integration) of and four barriers (exploitation, interaction misfit, privacy, and lack of confidence) to consumers' acceptance of TEP. The juxtaposition of these drivers and barriers, in combination with insights from prior literature, reveals five success paradoxes for TEP (exploration–limitation, staff presence–absence, humanization–dehumanization, personalization–privacy, personal–retailer devices). The findings provide several theoretical and managerial implications, as well as avenues for further research.

1. Introduction

Widespread store closures and bankruptcy filings (Green & Harney, 2017) make it hard to ignore the turbulent times for brick-and-mortar retailers. A confluence of factors, including technology advances, greater data availability, and digital native consumers who demand expansive customer experiences and convenience (Kahn, Inman, & Verhoef, 2018; Pantano, Priporas, & Dennis, 2018), has produced an altered competitive retail environment in which the in-store experience needs to merge the benefits of both digital and physical dimensions of retailing (Roy, Balaj, Sadeque, Nguyen, & Melewar, 2017; Willems, Smolders, Brengman, Luyten, & Schöning, 2017). Emerging technologies such as augmented reality and service robots also promise continued and fundamental changes to interactions between consumers and firms (Larivière et al., 2017). Accordingly, formerly purely online retailers like Amazon are investing in new technologies to deliver digital offline experiences (e.g., Amazon Go; Kohan, 2020), and brick-and-mortar retailers are acquiring retail IT (e.g., smart technology), spending an estimated $203.6 billion to do so in 2019 (Tech, 2019).

Innovative solutions are especially relevant in omnichannel environments, which offer vast amounts of information and force consumers to focus their attention specifically on only that content that appears personally relevant (Grewal, Roggeveen, & Nordfält, 2017). Consumers also have come to appreciate the personalized experience of shopping online and request similar personalization offline (McKinsey, 2019a), prompting retailers to seek out smart technologies that can support in-store personalization with an individually targeted in-store approach (e.g., Mittal, 2019; O'Shea, 2016). For example, the NomadX concept store in Singapore includes facial recognition features, so that when registered customers approach a touchscreen terminal in the store, they receive recommendations that reflect both their online purchase history and their previous in-store behavior (Lim, 2018). Such technology-enabled personalization (TEP) differs in notable ways from online personalization (e.g., recommendations from an algorithm) (Aguirre, Mahr, Grewal, de Ruyter, & Wetzels, 2015) and from traditional in-person personalization (e.g., personal recommendations from store employees) (Gwinner, Bitner, Brown, & Kumar, 2005). The new phenomenon involves the integration of physical and digital dimensions in

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offline retail settings to provide individual customers with relevant, context-specific information that reflects combinations of historic and real-time data. Whereas face-to-face personalization relies on sales representatives' observations, which they use to adapt their behaviors (Weitz, Sujan, & Sujan, 1986), TEP leverages automated tools to integrate historic and real-time data without interference from store employees. It also combines cognitive technologies, which collect, analyze, and react to customer data, with emotional technologies, which seek to enrich interactions and build customer relationships (Huang & Rust, 2017).

Despite growing interest in the influence of technology in retailing and services contexts (e.g., Huang & Rust, 2017; Inman & Nikolova, 2017; Roy, Balaji, Sadeque, Nguyen, & Melewar, 2017), existing research on smart retailing in general and TEP in particular is scarce. To support its use, continued developments and designs of shopper-facing in-store technology should reflect consumers' expectations and preferences (Pantano & Viassone, 2014). Therefore, identifying consumers' expectations and concerns is essential. We apply grounded theory to gain insights into consumers' expectations about smart retailing and TEP in retail stores, using an exploratory qualitative approach.

Our research objectives and related contributions are threefold. First, we conceptualize and investigate the novel phenomenon of TEP and its role in smart retailing. By categorizing existing smart retailing technologies and illustrating how they enable personalization in stores, we clarify the uses of smart technology in brick-and-mortar settings and how it can influence customers (Chiu & Hofer, 2015; Roy et al., 2017; Shankar, 2011). Our conceptualization of TEP also reveals novel opportunities for research, in that the concept bridges the gap between traditional face-to-face personalization in physical stores (Gwinner et al., 2005) and technology-mediated personalization (Shen & Ball, 2009) in online environments. Second, we take a consumer perspective and identify five drivers (utilitarian, hedonic, control, interaction, and integration) of and four barriers (exploitation, interaction misfit, privacy, and lack of confidence) to TEP. This framework of drivers and barriers related to innovative in-store personalization adds to growing research pertaining to consumers' reactions to personalization efforts (e.g., Aguirre et al., 2015; Tam & Ho, 2006), as well as a broader research tradition focused on technology adoption in stores (Inman & Nikolova, 2017). Third, the juxtaposition of drivers and barriers, in combination with insights from prior literature, reveals five paradoxes of consumers' TEP acceptance in stores. Two of them are known from personalization literature (personalization–privacy, humanization–dehumanization), but we also illustrate three novel paradoxes (staff presence–absence, exploration–limitation, personal–retailer devices) that have not been considered thus far in existing research. The implications and mechanisms underlying these paradoxes reveal broad opportunities for further research to improve our understanding of the influence of technology in retailing and services contexts (Huang & Rust, 2017; Inman & Nikolova, 2017; Roy et al., 2017). In proposing this retail and service personalization research agenda, we highlight the need to go beyond the current focus on the personalization–privacy paradox in retailing (Aguirre et al., 2015; Bleier & Eisenbeiss, 2015) and seek to contribute to the investigation of technology paradoxes in general (Johnson, Bardhi, & Dunn, 2008; Mick & Fournier, 1998).

After introducing smart retail technology for in-store personalization and conceptualizing TEP, we present our exploratory, qualitative research, designed to elicit drivers of and barriers to consumers' acceptance of TEP. We discuss our results, illustrate avenues for future research, and present theoretical and managerial implications.

2. Theoretical background

2.1. Technology as an enabler of smart retail

Smart physical retail spaces are augmented with intelligent technology that can sense, control, connect, and interact with shoppers (Roy et al., 2017), relying on interconnected networks of information about consumer behavior. Thus, the retail experience is specific to the consumer's context (Roy, Balaji, Quazi, & Quaddus, 2018) and seamless across channels; ideally, it should be perceived as personalized and enjoyable (Roy et al., 2017). Moreover, smart retail technology lets consumers gain a sense of control over their environment (Roy et al., 2017). From a consumer perspective, smart retailing integrates connected technologies in physical retail spaces to enhance the customer experience, by merging physical and digital dimensions and thereby creating an interactive, context-specific experience (which may include personalization).

Retailers draw on a myriad of customer-facing technologies to create customer intimacy (Willems et al., 2017), including digital (e.g., e-commerce), mobile (e.g., m-commerce, retail apps), and immersive in-store (e.g., smart mirrors, interactive fitting rooms) technologies. For our conceptualization, we focus on retail technologies that enable personalization at the point of sale, such that they are clearly evident for consumers (Willems et al., 2017); we include mobile phones too, because retailers leverage these consumer-owned technology devices to influence purchase behaviors (Bues, Steiner, Stafflage, & Krafft, 2017; Grewal, Ahlbom, Beitelspacher, Noble, & Nordfält, 2018).

Following Pantano and Viassone (2014), we categorize smart retailing technologies according to their technological characteristics (see Table 1 for an overview): immersive/immobile technologies, mobile systems, or hybrid systems. First, *immersive/immobile technologies* are provided by the store, and they function either autonomously by approaching the customer or as self-service technologies (SST) that are tasked with facilitating consumers' task completion (e.g., acquire product information) without requiring store employees (Meuter, Bitner, Ostrom, & Brown, 2005). Second, *mobile systems* rely on consumers' own mobile devices, mainly manifested as retailers' apps, though also involving third-party systems enabled by smartphones. Using in-store tracking technology and existing customer data, retailers can grant mobile users an interactive, context-specific, personalized experience (Bues et al., 2017; Gao, Rohm, Sultan, & Pagani, 2013). Third, *hybrid systems* feature mobile devices that are owned by the retailer (Pantano & Viassone, 2014), such as handheld scanners; they often rely on radio frequency identification tags on selected products, which provide information to guide context-specific recommendations (Wong, Leung, Guo, Zeng, & Mok, 2012).

In addition, the technology for smart retailing is designed explicitly to enable personalization (Roy et al., 2017). Although the benefits of personalization in face-to-face interactions (Gwinner et al., 2005) and online environments (Aguirre et al., 2015) are well-established, less research addresses how customers react to in-store personalization enabled by smart technology.

2.2. Personalization

No universally accepted definition of personalization exists (Vesanen, 2007), though it commonly refers to some targeted, individual-level marketing strategy (Tam & Ho, 2006), in which the consumer is passive, and all personalization efforts are initiated by the company (e.g., Aguirre et al., 2015). The company seeks to provide relevance by offering content or products of interest to customers as solutions to their needs. Relevance implicitly incorporates context specificity, which also is essential to personalization, to deliver "the right content to the right person at the right time" (Tam & Ho, 2006, p. 867). In studies of personalization in retailing, from both consumer (Aguirre et al., 2015; Bleier & Eisenbeiss, 2015; Kramer, 2007) and firm (Kalaignanam, Kushwaha, & Rajavi, 2018) perspectives, a widespread concern is that personalization is a double-edged sword, eliciting both favorable and unfavorable consumer outcomes (Tucker, 2012).

Predictions of favorable consequences often rely on adaptive information processing, self-referencing, or elaboration likelihood theories as a key underlying mechanism (Tam & Ho, 2006). For example, if

Table 1
Consumer-Facing Retail Technologies that Enable Personalization.

	Application	Exemplary Data Sources	Explanation	(Potential) Personalization Applications	Expected Consumer Value	Exemplary Sources
Immersive/ immobile Systems	Product experience wall	RFID, cameras for face recognition, third-party services (e.g., real-time weather data), store data	Interactive, context-specific recommendation system	Personalized recommendations related to lifestyle	Entertainment, effectiveness	Zagel (2016)
	Interactive fitting room	RFID, third-party services (e.g., product ratings), store data	Interactive environment that emotionally and functionally connects the consumer with the product	Personalized recommendations related to considered products	Support decision making (e.g., product information), inspiration	Dieck (2019); Wong and k., Leung, S. y. s., Guo, Z. x., Zeng, X. h., & Mok, P. y. (2012); Zagel (2016)
	Smart & social mirrors	RFID, cameras for body scans, third-party services, store data	Interactive, social systems that emotionally involve consumers (e.g., connected to social media)	Personalized recommendations related to considered products	Convenience (e.g., virtual try on), choice confirmation from peers	Dieck (2019); Zagel (2016)
	Smart shelf	Weight sensors, beacons	Digitally enhanced shelf that allows retailers to keep track of inventory, dynamically change prices, and communicate with consumers in-store based on proximity to a certain product (direct message on smartphone)	Personalized promotions	Greater product availability	Inman and Nikolova (2017); Klabjan and Pei (2011)
	(Touch) Screen	Digitally linked content	(Non)-interactive device that offers informational and emotional content	Personalized content	Information, entertainment	Dennis, Michon, Brakus, Newman, and Alamanos (2012)
Mobile Systems	Mobile apps	Beacons, barcode scanners, sensors	Application that uses of consumers' own mobile devices	Personalized recommendations based on in-store location	Check for availability, convenience (e.g., store navigation), efficiency (e.g., scan-and-go payment)	Bues et al. (2017); Inman and Nikolova (2017)
	Mobile augmented reality (MAR)	Camera, computer vision-based augmented reality, GPS	Interactive, real-time supplement of real and virtual images by computer-generated data, such as sound, graphics, or GPS data	Preference-based product display	Entertainment (e.g., playfulness), in-store navigation	Bonetti, Warnaby, and Quinn (2018); Dacko (2017)
Hybrid Systems	Virtual reality (VR)	Smartphone technology (e.g., 360-degree camera)	360-degree view enabled by a wearable device that immerses consumers in a virtual world and shields them from reality	Preference-based product display	Entertainment (e.g., convey emotional brand content)	Bonetti et al. (2018); Moorhouse, Dieck, and tom, & Jung, T. (2018)
	Service robots	Cameras for face recognition, third-party services (e.g., real-time weather data), store data GPS, digitally linked content	Interactive device that identifies, addresses, and (emotionally) involves consumers; connects to social media; stores databases of product information; and creates two-sided humanoid interactions	Personalized recommendations, FAQs, social media content	Entertainment, emotional appeal, information, content generation	Mende et al. (2019)

Notes: RFID (radio frequency identification) supports automated product recognition.

personalization evokes greater attention to the offering by creating self-associations, offering a good match with customer preferences, and inducing enhanced elaboration of relevant information, the effort may be more likely to succeed in terms of positively influencing purchase decisions, by creating delight, gratitude, or customer satisfaction (Bock, Mangus, & Folse, 2016; Vesanen, 2007). Studies that focus on unfavorable consequences instead tend to turn to privacy and reactance theories to explain the underlying mechanisms (Aguirre et al., 2015; Esmark, Noble, & Breazeale, 2017). These theories recognize that personalization efforts can increase consumers' privacy concerns, perceived risk, and sense of vulnerability, which in turn can irritate or alienate customers, resulting in negative effects on their purchase decisions and satisfaction (Aguirre et al., 2015; Bleier & Eisenbeiss, 2015). Such varied potential outcomes further highlight the need to investigate customers' expectations of and reactions to retailers' novel technology-driven personalization efforts.

2.3. Technology-enabled personalization in smart retail

Traditional personalization in retail stores has long been performed by store employees, who adapt the service offering or their interpersonal behavior to reflect an individual customer's preferences (Bock et al., 2016; Gwinner et al., 2005). Traditional, face-to-face personalization thus relies on employees and their ability to adapt; technology-mediated personalization in online environments instead builds on information technology and can draw on databases of customers' past behavior for personalization approaches (Aguirre et al., 2015; Shen & Ball, 2009).

Advances in consumer-facing smart retail technologies also support physical retailers' efforts to tailor their in-store personalization to each customer's needs. These retailers can leverage context-specific, traditional forms of personalization, through their employees, together with data about customers' past behavior, through technology-driven approaches. The smart retail technologies combine elements of both forms to achieve technology-enabled personalization (TEP) in stores. We define TEP as the integration of physical and digital personalization dimensions at the point of sale to provide individual customers with relevant, context-specific information, according to historic and real-time data in combination. All interactions between the retailer and customer involve digital devices (e.g., interactive screens, robots). Although it constitutes an emerging practice (Table 1), existing research on TEP and its influence on customers in smart retailing contexts is scarce. We seek to address this gap with exploratory, qualitative

research to identify drivers of and barriers to consumers' TEP adoption.

3. Method

3.1. Research design

To identify motivational patterns of consumer behavior and provide a basis for further research, we adopt an exploratory, discovery-oriented, grounded theory approach (Glaser & Strauss, 1967). Grounded theory can establish in-depth, rich information to gain an initial understanding of an unexplored phenomenon (Maxwell, 2013) and develop new theory (Bailey, 2014), so it provides a viable means to address research gaps (Edmondson & Mcmanus, 2007) and is well-established in the marketing literature (Rosenbaum, Cheng, & Wong, 2016). As Goulding (1998, p. 53) notes, "knowledge is … actively and socially constructed." To reduce the complexity of socially constructed phenomena, grounded theory focuses on participants' interactions with one another and their direct environment (Homburg, Jozic, & Kühnl, 2017), such that their views can shape the evolving theoretical concepts (Corbin & Strauss, 2015; Strauss & Corbin, 1997). To obtain insights on consumers' expectations of and concerns about TEP, we capture their opinions in interviews, without imposing any previous research findings (Creswell, 2012). Finally, grounded theory procedures require triangulated data (Homburg et al., 2017) and "an understanding of related theory and empirical work" (Goulding, 1998, p. 52). Research on personalization in general is fragmented, and research on TEP is scarce. With this research on TEP, we attempt to develop a more "integrated but novel understanding" (Homburg et al., 2017, p. 381).

We follow Homburg et al. (2017) in our application of grounded theory. In our initial review of relevant literature, we developed an underlying research question, guidelines for the semi-structured in-depth interviews, and criteria for the sample selection (Strauss & Corbin, 1997). Only then did we collect field data, which we later analyzed in light of supplementary literature.

3.2. Sample and data collection

In utilizing a purposive sample of 25 participants, we aimed to maximize diversity among respondents (Corbin & Strauss, 2015) by recruiting participants with different attitudes toward personalization in retail, distinct shopping behaviors (e.g., different levels of shopping enjoyment), and varied occupations. A screening questionnaire, emailed to 74 German consumers, revealed these traits. We purposively selected the informants for this research project on the basis of these diversity criteria. However, we limited the sample in terms of their generational cohort, including only millennials, and their familiarity with personalization and shopping. Most millennials have expertise with innovative technologies in general and their application in retail contexts in particular (Papagiannidis, Pantano, See-To, & Bourlakis, 2013); they also generally have used and value personalized content (Vrontis, Thrassou, & Amirkhanpour, 2017). We reached theoretical saturation after 21 interviews (Glaser & Strauss, 1967) and conducted 4 further interviews, averaging 52 min in length, over a four-month period. This process resulted in a sample of 16 women and 9 men, ranging in age from 19 to 33 years. To confirm theoretical saturation, we followed Holton (2010) recommendation and constantly reviewed the interview data to evaluate the emerging codes until no further properties could be identified. The diverse perspectives that resulted from our sampling procedure facilitated a comprehensive understanding of smart retailing and TEP in retail stores and reinforced the robustness of the data (Creswell, 2012).

In-depth interviews with consumers are exploratory in nature and reduce the distance between the researcher and the respondent (Johns & Lee-Ross, 1998); they seek to discover, rather than confirm, insights (Deshpande, 1983) and "provide a deep understanding of a phenomenon from the consumer's perspective" (Arnold & Reynolds, 2003, p. 79; see also Hudson & Ozanne, 1988). Previous studies on personalization and retailing also use interviews to obtain initial insights into unexplored fields (Arnold & Reynolds, 2003; Arnold, Reynolds, Ponder, & Lueg, 2005).

The interview guide consisted of questions about respondents' experiences, expectations, and concerns about TEP. The first part aimed to familiarize participants with the interview process and the topic by using general questions about participants' experience with personalization in retail. In the second part, we encouraged participants to identify their expectations and concerns about TEP, then put them in context with concrete examples, which helped us avoid misinterpretations of the resulting qualitative data (Wallendorf & Belk, 1989). To limit bias and meet quality criteria for interview questions (Patton, 2002), all inquiries were worded in a non-directive, open-ended, unobtrusive way. In the third part, we sought to limit directive biases by asking questions about participants' opinions of specific, shopper-facing, in-store technologies.

3.3. Data analysis & interpretation

All interviews were audio recorded and transcribed verbatim. The transcripts amounted to approximately 450 pages of single-spaced text and were coded and analyzed with the software MAXQDA. We conducted open, axial, and selective coding (Homburg et al., 2017; Kumar, Rajan, Gupta, & Pozza, 2019). Appendix A contains an overview of the coding results; the zero-, first-, second-, and third-order categories; and existing support for the zero-order categories if any prior studies have identified them.

In the open coding stage, we analyzed the transcripts line by line and grouped similar answers into zero-order categories (e.g., effortless use). In the axial coding step, we put the zero-order categories in context with the aid of supplementary literature, such as academic studies and reports from practice, and identified patterns and relationships. Thus, we could group the descriptive zero-order categories into theoretically abstract, first-order categories (e.g., inspiration through technology) (Homburg et al., 2017). Finally, with the selective coding, we regrouped the first-order categories into five second-order categories that represent drivers of consumers' acceptance and four second-order categories that represent barriers to TEP adoption. Any categories with poor fit were eliminated at this stage (Corbin & Strauss, 2015). To supplement the emerging categories, we continually compared them with relevant literature streams, including those devoted to personalization, retail experiences, smart retail, technology acceptance, and SST (Corbin & Strauss, 2015; Glaser & Strauss, 1967).

3.4. Trustworthiness assessment

To ensure the general trustworthiness and credibility of our findings, we relied on data and researcher triangulation (Lincoln & Guba, 1985). That is, we constantly compared our data with associated research streams. The categories we obtained are mostly applicable to our interviewees of different backgrounds, though with slight differences in their emphases. Two authors also coded the verbatim transcripts individually and discussed the coding plan after each coding stage. This step ensures internal consistency, and any disagreements were resolved through discussion (Ulaga & Reinartz, 2011). To ensure the reliability of our findings, we asked two independent judges, both unfamiliar with our research focus, to code the data obtained from five randomly selected interviews. The intercoder reliability scores, calculated according to the proportional reduction in loss measure (Rust & Cooil, 1994)— a common quality criterion for qualitative data analysis (Homburg et al., 2017)—reached 0.77 and are thus well above the threshold (Nunnally's rule of thumb) of 0.70. Moreover, we performed a respondent validation and randomly contacted five respondents to request their feedback on the final results (Homburg et al., 2017); they indicated strong agreement with the categories. By presenting our

developing work at several academic conferences (Kumar et al., 2019), we also obtained valuable comments and suggestions from knowledgeable researchers that we used to refine the results. Finally, we triangulated the results with industry reports (e.g., Accenture Interactive, 2018; BusinessWire, 2019; McKinsey, 2019b), selected expressly to ensure the high quality of the outlet (e.g., leading consulting companies, business magazines, blogs) and timeliness (published within the past five years). Overall, we reviewed 29 industry reports,[1] which we then triangulated with our results. Similar to our assessment of which codes had been supported by prior academic literature, we note the presence or absence of industry support for the zero-order categories in Appendix A. This step helps enhance the robustness of our results and their applicability to practice (Civera, Cortese, Mosca, & Murdock, 2019).

4. Findings and discussion

Our findings suggest that the success of TEP depends on five distinct drivers (utilitarian, hedonic, control, interaction, and integration) and four distinct barriers (exploitation, interaction misfit, privacy, and lack of confidence), which we detail in Appendix B. Reflecting the iterative process of our data analysis, we introduce each second-order category that emerged from our data by first explaining the category, then exemplifying it with supportive quotes from our interviews, and finally providing verification for the findings based on prior literature (Homburg et al., 2017).

4.1. Drivers

4.1.1. Utilitarian

Customers expect functional benefits. Utilitarian shopping values arise from a "conscious pursuit of an intended consequence" (Babin, Darden, & Griffin, 1994, p. 645), and TEP provides efficiency, effectiveness, and simplicity that can support this pursuit. The respondents believe TEP should help them find products faster, receive better matches with their preferences, and undertake a streamlined shopping experience, which reflects their utilitarian, extrinsic shopping motivations (e.g., saving time) (Babin et al., 1994; Hirschman & Holbrook, 1982). Relative to traditional personalization in brick-and-mortar retail settings, customers expect the content to be better preselected to match their current needs because, as one consumer explained:

> The … communication could be based on what I am currently looking at or what I take to the fitting room with me. That is why I believe the suggestions would really be suitable. They would probably match my taste very well! (ID 02)

Their expectations of simplicity refer to minimal complexity due to an intuitive, easy usage of the technology to complete the shopping task:

> What would help me, in particular, would be if I would initially get a product recommendation, for instance, what's new in the store or what I would possibly like, and also where I could find those products. (ID 06)

Utilitarian shopping values have been widely discussed in consumption literature in general (Babin et al., 1994) and personalization literature in particular (Ansari & Mela, 2003). In line with findings related to personalization in services (Shen & Ball, 2009), smart retailing (Roy et al., 2018), and industry (Accenture Interactive, 2018; BCG, 2019), the study participants value a more efficient, effective product search process through TEP in physical retail. Relative to online considerations (Ansari & Mela, 2003), they also value the decreased risk of information overload provided by offline contexts. In line with evidence from practice that personalization facilitates fast, easy purchases (Bazaarvoice, 2018), our respondents perceive that TEP might be helpful in their effort to find suitable products faster in stores and thereby create value.

4.1.2. Hedonic

Customers also expect positive emotional value from TEP, obtained in the form of inspiration, intrinsic satisfaction, pleasure at getting discounts, or the shopping experience. Hedonic value in retail arises because consumers appreciate the experience, which may be primarily characterized by playfulness and entertainment (Babin et al., 1994; Hirschman & Holbrook, 1982). This concept relates to the notion of customer delight[2] (Arnold et al., 2005), which, when achieved, can effectively differentiate the retailer that provides it (Finn, 2005). Extant literature on personalization tends to prioritize utilitarian values (Ansari & Mela, 2003; Shen & Ball, 2009), but our findings also strongly affirm the importance of the hedonic dimension, revealing that consumers expect TEP to offer inspirational content that enables them to discover novel things beyond their common search behavior:

> Because it knows the color of my eyes…, the color of my hair…, it can suggest things matching my complexion. I think I would be more open to new things…. That's why I believe personalization in stores is important. I guess that many people wouldn't consider trying different things. So this [TEP] could be inspiring! (ID 08)

That is, beyond seeking the benefits of relevant, functional suggestions that closely match their preferences (Vesanen, 2007), consumers appreciate inspirational suggestions enabled by the holistic perspective and precision of technology that can identify new purchase options. The potentially inspiring nature of technology-enabled communication also appears in research and industry findings that suggest SST can make "consumers aware of previously unrealized needs and desires" (Johnson et al., 2008, p. 423) by offering interesting product suggestions that consumers otherwise would not have imagined (Lamprecht, 2018). Consumer inspiration can lead to consumer delight by triggering positive emotions, such as the pleasure or joy that stems from an element of positive surprise (Böttger, Rudolph, Evanschitzky, & Pfrang, 2017).

We also observe that TEP is associated with hedonic values through intrinsic satisfaction. According to some service literature, interaction personalization, defined as "individualized courtesy and recognition behavior in firm-customer service interactions" (Shen & Ball, 2009, p. 82), has no effect on perceived value, but we find that consumers perceive intrinsic satisfaction from TEP in stores, especially due to the positive emotions associated with personal recognition and affirmation. In the words of one interviewee,

> Especially when in a crowd, being recognized and approached personally makes me feel great. If you immediately feel that the technology knows that you're in the store and welcomes you, that's really something. I would appreciate that. (ID 15)

Accordingly, consumers are not only more likely to purchase in a store that recognizes them and remembers their previous purchases but also may select more expensive products in such personalized shopping environments (Accenture Interactive, 2018).

Furthermore, the respondents cited the pleasure of discounts. Again, much prior literature focuses on the utilitarian value of financial benefits (Arnold & Reynolds, 2003), but the hedonic value derived from bargain perceptions goes beyond the purely monetary value or transaction utility (Babin et al., 1994). Consumers experience delight when finding

[1] The list of the 30 industry reports used in the data triangulation is available on request.

[2] Creating customer delight in this context involves "customers exposed to unexpected, pleasant experiences—those experiences which are delightful" (Arnold et al., 2005, p. 1133).

"unanticipated value" (Arnold et al., 2005, p. 1137). In line with existing research on shopping values (Babin et al., 1994), getting a good deal can evoke an emotional consumer reaction, an excitement and personal appreciation of the recognition of and insights into one's personal preferences: "If I have a product on my wish list for some time now, let's say shoes, and then go into the store and they would somehow know … and offer me a discount on those exact shoes, I think that would excite me! (ID 19)".

Because it reflects a combination of the experiential dimension of offline retailing and advanced technological capabilities (Pantano & Naccarato, 2010), TEP should provide consumers with hedonic value from its experiential aspects. In practice, early implementations of Pepper robots have already made some service experiences "fun and enjoyable for consumers" (BusinessWire, 2019). Smart technologies can create memorable in-store experiences (Poncin, Garnier, Mimoun, & Leclercq, 2017); one respondent even called TEP:

> … awesome! For me, it kind of has, how should I put it, a cool experience vibe to it. Because it really focuses on me as a customer. I could also imagine the screen showing me further information related to the things I'm looking for. (ID 19)

As this statement suggests, consumers derive hedonic value from experiences created through smart technologies in stores, especially the personalized aspect. The retailer thus evokes a positive emotional response that goes beyond mere satisfaction to create excitement or delight.

4.1.3. Control

Consumers want to be in control of self-revelation, the trigger for TEP, and have a chance to cocreate. In line with Brehm (1993) view of control, perceived control over TEP refers to the extent to which the consumer may choose to reveal personal information or be personally approached. Most research focuses on control for privacy purposes, as related to products in physical retail settings (Esmark et al., 2017), data collection for personalized advertising in online retail (Aguirre et al., 2015), or transparency about data collection (Accenture Interactive, 2018). We find that consumers also want the explicit right to permit a retailer to recognize them and actively reveal themselves, or not:

> What I think would be great is if they had some kind of terminal at the store entrance where you could check in … similar to a boarding pass for airplanes. For me as a customer, it is important to decide for myself whether I want to be recognized. (ID15)

This driver also pertains to control over the initiation and content of the personalized communication. A majority of our respondents prefer to trigger the process themselves, which partially contradicts a common understanding of personalization that indicates a passive role of the consumer (Arora et al., 2008). However, it resonates with findings related to SST that indicate that perceived control is an important antecedent of usage (Bateson, 1985), leading to suggestions to "only leverage personalization where it … was a response to a clear indication of interest" (BCG, 2019). In addition to triggering TEP, consumers seek to take part in content creation and obtain individualized shopping experiences (Roggeveen, Tsiros, & Grewal, 2012) such that

> I would like to give feedback [on recommendations]. It's kind of like Spotify. They recommend songs on your personal radio and you can give the songs a thumbs-up or down. I think that's the only way the system can get to know me and suggest things I really like. (ID 21)

Through such cocreation, consumers can ascribe outcomes to themselves, rather than attributing credit to the retailer, so that they may feel a corresponding sense of accomplishment and satisfaction (Meuter, Ostrom, Roundtree, & Bitner, 2000). By accounting for particular TEP circumstances in physical stores, we thus suggest an extension to prior literature that emphasizes interpersonal relationships and data usage control topics. As some industry reports imply (BusinessWire, 2019; Infosys, 2019; Weinberg, 2019), consumers want to take an active role in the process, rather than accepting passive subordination to TEP, to customize their own digital in-store experience. This finding offers a relevant challenge to some previous conceptualizations of personalization.

4.1.4. Interaction

Positive perceptions of TEP often result from the interactions in a personalized, smart retail store. Rather than addressing how consumer traits affect SST interactions (Dabholkar & Bagozzi, 2002), our findings resonate more with the benefits accrued from having service interactions with and across devices, technologies, personal references in the content, and sales associates as personally desired per to the perceived traits of each. First, consumers value a flexible, shielded interaction with TEP devices. They want personalized content during their in-store journey, but they want it presented in a subtle way. Their relationship with the device, and especially their perceived emotional proximity to it, appears highly relevant (Brasel & Gips, 2014). We know of no research that specifies appropriate device characteristics according to such criteria; in addition, we find contradictory expectations across consumers. Some of them appreciate personalized content on their own devices, whereas others would be more comfortable receiving it on retailer-owned devices, because they do not want to grant the retailer access to their personal devices:

> I would expect this message on my own phone, I think it would be strange if, for instance, a robot approached me with content that closely relates to myself. (ID 05)
>
> A personalized message on my own smartphone would be strange because it's a part of me and I feel that this would be too personal. A screen or something else that belongs to the store would be way more pleasant! (ID 01)

Second, the intimacy of the content drives consumers' acceptance. Personalized content by definition targets individuals and thus is associated with the self. Accordingly, it positively affects consumers' attention and subsequent cognitive processes (Tam & Ho, 2006). Our respondents accept content that refers to their outer appearance but not their personal information:

> If there were an opportunity for them to scan me somehow—that would actually be rather cool. But I wouldn't want them to need my name, my birthday or something else, but they would be allowed to scan my body. (ID 12)

Third, many consumers hope to create a shopping experience without the interference of sales staff (Meuter et al., 2000). One consumer "hate[s] when [sales representatives] bustle around him" (ID 24), and another does not "like this babbling" (ID 12). Beyond a generally negative perception of sales employees, these respondents believe that technology-enabled content offers better quality. Unlike a store employee, the "technology doesn't start from scratch but can pick up on something (ID 14)." Fourth and finally, with regard to the technology's traits, consumers "appreciate its objectivity" (ID 14) and value its proficiency, in line with widely reported consumer expectations of a "superior one-to-one personalized experience" when supported by technology (PwC, 2017).

As noted previously, manifestations of interactions with technology have not been widely addressed by previous studies on personalization, though some service literature offers partial insights about the role of sales representatives (e.g., Larivière et al., 2017; Meuter et al., 2000). For sales representatives, knowledge of individual consumer preferences, ease of contact, and competence ensure the quality of interpersonal service (Parasuraman, Zeithaml, & Berry, 1985), and our data support the transfer of such findings to a TEP context.

4.1.5. Integration

Personalization demands extensive data collection (Montgomery & Smith, 2009), and we find that a relationship based on such data can enhance TEP success. The data may refer to consumers' past (online and offline) and in-store behaviors, and our respondents accordingly cited the value of TEP as an enhancement of their existing personal relationship with a particular retailer:

> It [product recommendation] should be based on my style, I mean, based on what I usually buy at this store. (ID 10)

Customers want recommendations that reflect their past purchases and preferences (Infosys, 2017), and accordingly, they appreciate the relationships and believe the retailer's knowledge about their purchase history can benefit them. Our data suggest that consumers predominantly value an exclusive history with a certain brand as a content source, but a few comments also indicate that third-party data sources might drive TEP success too:

> The best case would be that I chose shoes on Zalando.de[3]…. And then, when I am in a real shoe store, like Footlocker, they know what kind of shoes I like. (ID 20)

Research into the uses of data for personalized content tends to focus on data collection processes (Aguirre et al., 2015), rather than data sources, and thus does not distinguish between retailer and third-party data. Yet consumers appear generally aware of data collection practices by third-parties, such as social networking sites. Although the benefits of such consumer ecosystems have been acknowledged in practice (McKinsey, 2019b), insights into consumers' own perceptions remain scarce. With our findings, we offer the novel proposition that the integration of data, whether exclusively within a customer–retailer relationship or augmented by third-party sources, is essential to the acceptance of TEP and requires further consideration, as reflected by comments from our interviews that emphasize the relevance of real-time data collected in-store:

> It could be based on my in-store behavior. There could somehow be several cameras in the store that see when I pick up a product and then put it back again. Based on that, they could infer that I am interested in this product…. So based on what I do in the store, without any account data. (ID 06)

This informant added that he believes that such data are "more relevant because they are based on current behavior" (ID 06), whereas historic data could become obsolete quickly. Real-time data collection is essential to face-to-face personalization, which requires actors to perceive the present situation (Gwinner et al., 2005) and adapt to customers' desires; we affirm that it also creates added value for TEP efforts.

4.2. Barriers

4.2.1. Exploitation

The exploitation barrier relates to consumers' fear of being taken advantage of by the retailer, due to opportunities to overreach financially, manipulate consumers' decision-making process by abusing personalized information or limiting decision options, and unfairly benefiting from a lack of transparency and alternatives for consumers. With regard to concerns about financial overreach, the respondents express the sense that retailers seek to sell at any cost and that TEP enables them to "carry price discriminations too far" (ID 18), such that

> They would have the opportunity to better and better assess a customer's willingness to pay right in the store and then discriminate prices even more strongly. I'm afraid they would take advantage of our maximum financial budget! (ID 18)

Haucap, Reinartz, and Wiegand (2018), similarly note that consumers in their study "feared that differentiated pricing would bring long-term disadvantages." In terms of freedom of choice, consumers worry TEP might reduce decision autonomy:

> It is kind of similar to sharing a political orientation and then Facebook only shows you your own opinion. You suddenly don't have a differentiated offer anymore because you only get to see your opinion. You no longer have the chance to create your own taste. (ID 17)

Industry reports concur that "consumers don't want brands to define their journeys, they want brands to offer experiences that help them carve their own paths" (Accenture Interactive, 2018, p. 6); environmental psychology research also establishes that consumers do not like being obviously influenced by the retail environment when making purchase decisions (Donovan & Rossiter, 1982). Intrusive stimuli have unfavorable impacts on consumer behavior (Arnold et al., 2005). For example, when mobile in-store advertising enhances perceptions of the retailer's dominance over the consumer's decision making (Donovan & Rossiter, 1982), it mediates the relationship between personalization and purchase intentions (Bues et al., 2017). We find support for similar links in a TEP context. An opaque, inflexible machine might create path dependency through consistent alignment, leading consumers to fear that they are no longer in charge of their decisions after they have disclosed their preferences, so they may be subject to manipulation.

Although this exploitation barrier rarely appears in prior personalization literature, research on innovation adoption establishes that risk perceptions tend to be associated with financial losses (Forsythe & Shi, 2003) and inhibit consumers' willingness to try a new technology (Meuter et al., 2005). Our study extends this notion by introducing consumers' fear of being exploited by an opportunistic technology or company.

4.2.2. Interaction misfit

This psychological barrier arises when an interaction with TEP-enabling devices and its implied humanization changes the shopping experience. The first dimension, which we refer to as interaction interface discrepancy, results from a perceived incongruence with previous personal experiences in retail settings, such as interacting with store employees to enable the experience (Bäckström & Johansson, 2006; Ram & Sheth, 1989), especially for personalization (Gwinner et al., 2005). The absence of sales representatives, replaced by TEP tools, creates an inconsistency that may lead consumers to reject the innovation (Ram & Sheth, 1989) because they "still prefer human interaction, they want to talk to associates" (PwC, 2018).

> I believe that humanity and human contact and social interactions are an important factor. And if even the consulting in a store is conducted by machines, I will probably not see any humans anymore when shopping. I think that would be sad. (ID 13)

In addition to suggesting a need for human interaction, our data indicate that consumers anticipate that an interaction with technology might not fit their expectations of the shopping experience. As one interviewee noted, it "would be strange if some kind of machine tried to build a relationship with [me]" (ID 05). Such discomfort with technology is commonly associated with humanoid elements (Mende, Scott, van Doorn, Grewal, & Shanks, 2019). According to the uncanny valley effect, "an increasingly humanlike appearance would lead to increased liking up to a point, after which robots appeared too human and became unnerving" (Gray & Wegner, 2012, p. 125). In particular, humanlike expressions of feelings and emotions often trigger unease, separate from the machine's appearance, especially if robots nearly succeed in

[3] An online shoe and apparel retailer based in Germany.

convincing consumers that they are human (McKinsey, 2015). In TEP, this effect seems particularly relevant because interpersonal, human tasks requiring empathy are executed by a machine.

4.2.3. Privacy

This barrier reflects consumers' perceptions that controls on data collecting and analysis efforts are insufficient, such that the retailer appears likely to invade their privacy through identity disclosures, irresponsible data sharing, or monitoring; the presence of other customers further complicates the issue. First, respondents noted a strong aversion to identity disclosures resulting from the collection of their personal data. Particularly in unfamiliar environments and usage situations that require the consumers' own devices, which makes it "too personal" (ID 01), displays of personal information appear invasive, and

> It would be creepy if some random retailer, where I have never been before, addressed me by name. (ID 21)

Second, consumers reject a retailer's uses of data that they did not explicitly provide (Accenture Interactive, 2018), especially if it is clear that the data were shared among businesses (Bitar, 2018). Our respondents expect retailers to protect their personal data from data breaches and never share or sell it to third parties. In the words of one consumer,

> It would be fine for me if it [personal data] stays with the company that I agreed to share it with. But they would have to assure me that they really would not pass on my data to another company. (ID 08)

Third, along with privacy concerns related to the retailer, consumers report similar concerns about other consumers. We find limited evidence of this barrier in prior literature or industry reports, but as one of our respondents made clear,

> Large companies have so many customers. To them, I am just a face in the crowd. If, however, other people in the store were to get hold of my personal information…, I would definitely not like that. (ID 02)

Fourth, in addition to the perceived risks of their data being exposed, consumers do not like the behavioral sense associated with being watched in stores, which creates feelings of pressure:

> When I am not quite sure how something works and I haven't done it before, I might get flustered if it doesn't work the way I wanted, particularly when others are around. (ID 19)

The respondents strongly reject being monitored, especially if they are not made aware of this practice. In this way, TEP can trigger a perceived lack of anonymity or feelings of being under surveillance. According to two separate consumers:

> That's surveillance, somehow. Well, you enter a store and that store virtually knows who you are. That has a surveilling character. (ID 10)
> I feel uncomfortable being monitored like this. (ID 02)

Generally, the feeling of being observed by a company is perceived as an invasion of privacy, and this sense can be heightened by personalized content (Brehm, 1966). The negative perceptions of automated recognition and tracking services also appear in practice (BCG, 2018; McKinsey, 2018). Personal identification can evoke a perceived lack of anonymity, which translates into a feeling of being tracked (Noble & Phillips, 2004) or observed (White, Zahay, Thorbjørnsen, & Shavitt, 2008). In physical retail environments, consumers' feeling of being watched by store employees leads to a perceived loss of control over privacy and thus negative consumer reactions (Esmark et al., 2017), which seemingly occurs when they also feel watched by technology.

In discussions of privacy concerns related to personalization (Aguirre et al., 2015) and smart products (Mani & Chouk, 2017), a general consensus implies that "personalization is infeasible to achieve without some loss of privacy" (Chellappa & Sin, 2005, p. 187). Most studies focus on privacy concerns elicited by the collection, analysis, and handling of personal data in online environments (e.g., Aguirre et al., 2015; BCG, 2018). However, privacy concerns about other customers are specific to physical environments in which their presence generally is perceived negatively (Eroglu, Machleit, & Barr, 2005) and can evoke social anxiety, or "discomfort associated with the awareness of other people's perspectives of oneself as a social object" (Dabholkar & Bagozzi, 2002, p. 187). Suspicions that machines, unaware of the need for and incapable of offering discretion (e.g., audible recommendations, large digital displays), might make personal needs or traits transparent represent a relevant barrier to TEP success too.

4.2.4. Lack of confidence

Finally, many consumers anticipate the hassle of the use of a (new) technology (Burke, 2002) and have limited confidence its convenient use. Relative to TEP, one interviewee offered an example:

Then again, I have to register with some kind of customer account. This becomes exhausting; I wouldn't feel like doing that. (ID 20)

The interviews thus indicate support for findings of consumers' limited willingness to switch interaction opportunities or convert from offline to online environments if the process seems cumbersome or inconvenient (Burke, 2002). Furthermore, consumers may lack confidence in the technology itself and its abilities to make shopping more convenient. Thus, they are "not sure whether they [I] would trust a mirror that is controlled by a computer if it said 'Oh, that suits you well'" (ID 14). This lack of trust in the technology's capabilities may also stem from consumers' lack of confidence in its maturity.

We do not know of any personalization studies that investigate lack of confidence, though this effect is evident in retailing (Burke, 2002) and service (Johnson et al., 2008) domains. In virtual settings, consumers avoid using functions they perceive as complicated or inconvenient, even if those functions might improve the service (Burke, 2002). Findings from practice further suggest that consumers require human interaction as soon as a technology malfunctions and refrain from using any applications that lead to complications or are slow to navigate (Howland, 2017; PwC, 2018). The evidence of such technology skepticism obtained from our interviews is in line with predictions that consumers experience "a sense of annoyance and irritation" (Moorhouse, Dieck, & Jung, 2018, p. 136) if a technology fails to perform as expected. Trust in the technology's ability to perform a task also drives the adoption of TEP in physical retail.

4.3. Paradoxes and research outlook

Juxtaposing the five drivers and four barriers with findings from established literature reveals the partially contradictory motivations for adopting TEP; consumers even anticipate their own conflicting perceptions. The presence of contrary perspectives is an essential characteristic of a paradox (Handy, 1995). Considered individually, paradoxical statements are true; taken together, they seem essentially contradictory or incompatible (Johnson et al., 2008). We adopt Mick and Fournier (1998) conceptualization of a paradox, in which "something is both X and not X at the same time" (p. 125). Such statements are valuable for theory building because they reveal insights from competing perspectives (Mick & Fournier, 1998; Poole & Van de Ven, 1989). No equilibrium is required between the antithetical conditions (Handy, 1995); rather, a constant shift occurs between the polar opposites, often due to situational factors (Mick & Fournier, 1998). We identify five paradoxes pertaining to the implementation of smart retail and the success of TEP in stores, as well as some situational factors that might be influential and require further research consideration. Among the five paradoxes, three are novel and specific to our study setting (exploration–limitation, staff presence–absence, and personal–retailer devices), and two are resonant with previous literature that identifies

Table 2
Paradoxes and Implications for Managers and Future Research.

Paradox	Contradictions	TEP Specifications	Managerial Implication(s)	Potential Research Questions
Exploration–limitation	+ Desire to explore new options- Fear of being restricted in choice	+ Benefit from technology's comprehensive advice- Fear of missing out due to technology's path dependency	1. Promote technologies' holistic knowledge of product portfolio and recognition capacities for objective matches and inspirational input 2. Allow for consumer cocreation and corrective activities 3. Explain reasoning for suggestions and purchase decision process 4. Include "present alternatives" and "show all options" features to avoid feelings of paternalism	1. How can TEP reduce consumers' information overload without being perceived as restrictive? 2. How can consumers' fear of missing out be handled (e.g., excluded recommendations)? 3. How can the feeling of being patronized be avoided? 4. How transparent should the criteria for personalized content be made to the customer? 5. What is the ideal balance of third-party and retailer data in up-stream activities? 6. How can effective personalization content be created by AI?
Staff presence–absence	+ Need for human interaction- Annoyance from sales representatives	+ Desire for the presence of sales employees- Frustration over sales representatives' obtrusive, inapproachable, incompetent behavior	5. For the TEP transition phase, implement technology-mediated personalization to ease transition 6. Define clear roles for sales staff and technology for unobtrusive tasks 7. Include intuitive processes for consumers to request help from technology/staff	7. How can sales representatives contribute to enhancing the in-store experience in the future? 8. How should a digital sales representative approach consumers to be perceived as unobtrusive but helpful? 9. What traits make employees suitable for delivering TEP? 10. How can customer segments that do not seek device interaction be targeted and addressed?
Humanization–dehumanization	+ Desire for human characteristics of technology- Fear of too humanlike appearance	+ Desire for empathic interaction with technology- Discomfort created by interaction with humanlike technology	8. Use humanoid technology designs, but avoid imitating human behavior 9. Promote nonhuman traits, such as true objectivity and emotionlessness, as valuable technology skills	11. To what extent should the interface contain human traits? 12. What are the minimal requirements for empathy that should be included in the personalization device? 13. How responsive should technology be?
Personalization–privacy	+ Desire for personalized content- Invasion of privacy	+ Desire for context-specific, personalized recommendations- Other customers seeing personal preferences and information	10. Require consent for data disclosure and personalized offers 11. Offer selection opportunities for personalization levels 12. Select shielded/silent TEP when using non-obvious/observable data for recommendations	14. How explicitly should a personalized message be targeted at a customer? 15. Which observable (personality) traits should be used for personalization so the content will not be perceived as invasive? 16. How should the personalized content be presented (e.g., audio, video, writing)?
Personal–retailer device	+ Desire for comfortable device usage- Unease from invasive devices	+ Exclusive and accessible content presentation- Discomfort from invasive presentation of personalized content	13. Offer customized device choices Offer opt-in for personalization services also on own devices 14. Use personal devices for sensitive information and immersive devices for publicly available information 15. Avoid disclosing sensitive information (name, history) on observable devices	17. On which technology (e.g., immersive, mobile, hybrid) should personalization be presented in store? 18. How should customer segments be addressed differently based on their device preferences? 19. How explicitly should a message address an individual on his or her own device in-store before it is perceived as invasive?

Notes: + indicates the paradox perspective resulting from drivers; - indicates the paradox perspective resulting from barriers.

personalization–privacy (Aguirre et al., 2015) and humanization–dehumanization (Gray & Wegner, 2012) paradoxes. In Table 2, we summarize these paradoxes and apply them to a TEP context. We also list research questions that could guide continued investigations of TEP.

4.3.1. *Exploration–limi tation*

Consumers might be inspired to discover new things, beyond their usual shopping scope, while also feeling restricted in their choices due to the TEP. This paradox reflects a fundamental issue for personalization: A preselected set of options helps reduce information overload and search costs (*efficiency*), but it might create a risk of missing out on relevant options or considerations (*decision autonomy*). This perception is enhanced by the enabling effects of the technology, particularly when its processes are insufficiently transparent. Consumers likely do not understand the complex data management processes underlying a digital recommendation, and they may sense that they cannot influence a machine after it has performed its predetermined functionality, unlike their ability to enter into a discussion with a human sales representative to clarify their needs. They thus

worry about falling under the machine's control, with little opportunity to provide personal input or pursue alternative purchase options. The perception of a lack of decision autonomy is also path dependent, in that consumers experience even greater fears about poor purchase outcomes if the technology has collected personal information without their knowledge, rather than through their purposeful self-disclosure. Yet in addition to the efficiency benefits, TEP might offer inspiration by recognizing consumers' appearance, mood, or shopping history, then linking that information to the extensive information it has about options (*integration*), which is more than any single human actor could possess. It thus might motivate consumers to try products they would not normally have considered, with expanded freedom to explore new opportunities (*inspiration*).

Additional research should continue investigating this phenomenon. The implicit trade-off between being inspired and being patronized could have relevant impacts on consumer experiences and adoption behaviors. In addition, future research should assess the consequences for upstream value activities, such as the type of data necessary to provide content that does not make the customers feel restricted in their choices. Additional studies might investigate how retailers can develop and sustain networks with partners to deliver suitable content. Methods for integrating and finding an acceptable balance of external data (third parties) with retailer data also need to be evaluated. Furthermore, research should focus on how effective personalization content can be created by AI. Another potential influence could be consumers' desire to cocreate personalized service experiences (*cocreation*). We call on researchers to assess the degree to which involving consumers in content creation leads to favorable outcomes.

4.3.2. Staff presence–absence

This paradox emerges from consumers' contradictory feelings toward personalization provided by humans versus TEP in physical retail settings. In some cases, consumers want to shop independently, without interacting with store employees (*sales representatives*); they even prefer substitution by technology (Meuter et al., 2005). In other situations, they seek human interaction (*value misfit*), and the ability to obtain it marks a key differentiation factor for physical retail, relative to impersonal online shopping. In TEP settings, consumers are skeptical about the technology's capabilities and persist in their belief that human input, with its empathic features, is necessary to create truly personalized experiences (*trust in competence*). Yet the content created by technology may be more accurate and helpful, so some consumers prefer TEP over personalization by human employees.

As this paradox stresses, consumers' feelings about human interactions in physical retailing are not straightforward. Technology has the potential to increase personalization quality, but it is restricted by social limits. The role of sales representatives in digital retail environments, especially if traditionally human tasks (e.g., personalized sales consulting) are performed by technology tools, represents a topic for further research. Particular attention should be paid to identifying the relevant factors that enable employees to overcome technology resistance for recruiting and training purposes.

4.3.3. Humanization–dehumanization

This paradox, also referred to as the uncanny valley phenomenon, exists because consumers perceive interactions with machines as strange if the machines are too humanlike (*technology humanization*) or imitate human behavior (Gray & Wegner, 2012), such as when TEP personally addresses consumers. Yet consumers also want the technology to have human traits, such as being empathic (*technology traits*). This trade-off has important managerial implications that additional research could specify, such as by determining the extent to which an interface should feature human traits in different settings.

4.3.4. Personalization–privacy

We find support for this well-established paradox (Aguirre et al., 2015); consumers value personalized content but do not want to disclose their own identity. They desire personalized content *(content intimacy)* for several reasons. It gives them a feeling of appreciation (*intrinsic satisfaction*) and also offers the promise of a more efficient (*efficiency*) and enjoyable (*experience*) in-store experience. These perceived benefits of personalization require shared customer knowledge through retailer–customer relationships (*past behavior*). However, consumers experience particular discomfort if other customers take notice of their personalized information (*other customers*). Identity disclosures based on personal information also can elicit feelings of creepiness, particularly in unfamiliar environments (*identity disclosure*). Therefore, continued research should assess the extent to which a message should be personalized when displayed in public (e.g., retail store), as well as how the personalized information should be presented. Different implementation designs might minimize privacy concerns, especially in relation to other customers.

4.3.5. Personal–retailer devices

Consumers have contradictory expectations regarding which medium or device should transmit personalized content. They recognize the functionality of receiving personalized content on their own device (*device*), but they also perceive personalized messages on their own smartphones as invasive (*disclose own identity*). If they can leverage consumers' devices, retailers could outsource some costs, ensure individually targeted messages, and gather detailed data. Furthermore, consumers might develop a greater sense of psychological ownership over the presented content when it appears on their own device, rather than a retailer-owned one (Brasel & Gips, 2014). We similarly find evidence that their relationship with a device, expressed as emotional closeness, affects consumers' TEP acceptance (*device*). Most consumers perceive their smartphones as parts of themselves; thus, they may feel more comfortable if content that is directly related to them appears only on their devices. But this practice can also produce a sense of invasiveness (*disclose own identity*), and consumers are reluctant to grant retailers access to their personal devices, which increases the risk that they might obtain consumer information without permission. Furthermore, the personalized messages are difficult to avoid, whereas personalized content offered on a retailer's device can be halted easily, simply by rejecting their use or returning them at the end of the shopping trip. Consumers want the opportunity to determine when they receive personalized recommendations, and we recommend that continued research evaluate the suitability of different technologies (retailer-owned versus customer-owned devices) for TEP in different retail settings.

5. Conclusion

5.1. Theoretical implications

Compared with research on traditional, face-to-face personalization in physical stores (Gwinner et al., 2005) and technology-mediated personalization in online environments (Aguirre et al., 2015; Shen & Ball, 2009), this study provides a novel conceptualization of TEP and its relevance for smart retailing (Roy et al., 2017). In particular, we propose that TEP merges the merits of face-to-face offline personalization with those of data-driven online personalization to create a new form of service personalization. In bridging this gap, our conceptualization provides novel opportunities for research on personalization in retailing in general and smart retailing in particular. Furthermore, we suggest a categorization of existing smart retailing technologies and their roles in TEP, which can provide an additional basis for academic research on smart retailing and practice-based investigations of smart retail technology in brick-and-mortar settings (Chiu & Hofer, 2015; Roy et al., 2017; Shankar, 2011).

We take a consumer perspective to investigate TEP in stores and shed light on innovative offline personalization strategies in the context of

smart retailing. Identifying consumers' expectations and concerns is essential to guide the usage of smart retailing technologies. From customer-provided insights, we identify five drivers (utilitarian, hedonic, control, interaction, and integration) and four barriers (exploitation, interaction misfit, privacy, and lack of confidence). Thus, our investigation of TEP identifies opportunities, hurdles, and their combined effects for retailers and consumers. To leverage the TEP opportunities and avoid their downsides, retailers must provide a way to enhance consumers' perceptions of being in control, an interactive design, and protections of personalized content. To create more engaging shopping experiences in offline retail, TEP particularly needs to provide emotional value through technology that entertains customers and/or offers inspirational content beyond customers' common search behaviors. Beyond these insights, we provide a framework for predicting the effects of innovative in-store personalization on customers and the mechanisms that might lead to favorable versus unfavorable outcomes. We thus advance research into consumers' reactions to personalization in retail (Aguirre et al., 2015; Tam & Ho, 2006), as well as research focused on the adoption of technologies in stores (Inman & Nikolova, 2017). The framework also suggests potential avenues for research on smart retailing and TEP.

Finally, our analysis of the five drivers and four barriers suggests that customer perceptions of TEP can be contradictory. We accordingly develop and propose five paradoxes, two of which also appear in studies of physical or online retailing, namely, personalization–privacy (Aguirre et al., 2015) and humanization–dehumanization (Gray & Wegner, 2012). Reflecting the specific context of smart retailing and its features, such as public displays of recommendations or the integration of human traits into technology, we outline further avenues for research related to these two paradoxes. In addition, we identify three novel paradoxes: staff presence–absence, exploration–limitation, and personal–retailer devices. They suggest a relevant foundation for studying mechanisms that drive the success of personalization in general and of TEP in stores in particular.

As such, these paradoxes offer a multitude of potential research directions. Table 2 contains an outline of relevant research avenues related to uses of TEP in retail stores. We highlight the research implications of our three novel paradoxes particularly though, to encourage research on personalization that moves beyond a predominant focus on the personalization–privacy paradox (Aguirre et al., 2015). For example, research into the exploration–limitation paradox might investigate how customers' desire to benefit from personalized recommendations via technology device can be balanced with their fear of missing out, due to the technology's path dependency. Another interesting avenue might be to determine which technological devices (e.g., immersive, mobile, hybrid) should present the personalization services in stores, to address customers effectively without becoming invasive (personal–retailer device paradox). Research dedicated to the staff presence–absence paradox also can investigate the fundamental question of how sales representatives might contribute to enhancing the in-store service experience in smart retail stores. Through studies that specify the sources and implications of these paradoxes, we could gain meaningful insights into the influences of technologies in retailing and services (Huang & Rust, 2017; Inman & Nikolova, 2017; Roy et al., 2017) and their resulting technology paradoxes (Johnson et al., 2008; Mick & Fournier, 1998).

5.2. Managerial implications

The available consumer data volume doubles every year (Shankar, 2018); investments in retail technology also continue to increase. Thus, the opportunities for TEP have never been greater. We leverage our empirical data to offer suggestions for its successful implementation that are in line with the five paradoxes we identify.

5.2.1. Transparent, interactive processes

As the exploration–limitation paradox indicates, customers vacillate between their wish to be inspired and their fear of being limited by the technology. Therefore, retailers need to establish explicit processes to enable customer cocreation and corrections (e.g., actively seeking consumer feedback on recommendations), as well as holistic views of the product portfolio (e.g., display all products). The algorithms that underlie TEP should be as transparent as possible (e.g., progress displays) to reduce consumer mistrust. Finally, to promote TEP as a source of inspiration, retailers should help consumers use the full range of recommendation functions so that they can appreciate the richness of TEP.

5.2.2. Symbiosis of staff and technology

The staff presence–absence paradox describes consumers' desire for human interaction and their simultaneous annoyance with sales representatives' intrusiveness. Accordingly, during their transition to TEP, retailers might assign sales staff to stand near the technological devices to help consumers learn how to use the technology through helpful human interaction. As their technological functionality improves, TEP devices might require continued interventions by human sales personnel. Consumers should be able to determine which tasks they want to do alone, without feeling abandoned. Ultimately, even if customer engagement primarily relies on technology, the availability of human staff members for particular requests (e.g., empathic interaction) remains valuable, implying it could become a form of differentiation and an indicator of a good shopping experience.

5.2.3. Avoid excessive human-likeness

To avoid discomfort due to the humanization–dehumanization paradox, the design of the TEP and related devices, such as service robots, should include some humanoid, appealing features but avoid extensive imitations of true human behavior, especially in service robots ("Pepper is not trying to be human—it's trying to be social"; Weinberg, 2019). Because nonhuman features of technology, such as objectivity and rationality, are perceived as beneficial, they should be promoted as consumer benefits (e.g., "honest" technological consultants).

5.2.4. Check-in and external trait focus

The well-established personalization–privacy paradox acknowledges that consumers value personalized content but also fear invasions of their privacy. People prefer to be in control when using SST (Bateson, 1985), and similarly, the use of TEP should include a choice of whether to be recognized or not for each experience. A digital check-in terminal might offer a good solution: If they actively decide to obtain a personalized in-store experience by checking in, they likely will be receptive to personalized content. However, the content should be limited to external, outward, visible characteristics of the consumer, not her or his core, inner traits. Personalization also tends to be more successful if it is implicit (e.g., referring to a certain style), rather than explicit (e.g., addressing customer by name). Consumers want content that reflects their preferences or appearance, but if the information is obviously connected to their personal data, they reject it. Messages that cite an obvious data source (e.g., hair color, current outfit) thus are preferable. Finally, the presence of other customers creates additional privacy issues. Consumers likely feel too exposed if others are able to see their personalized information, so TEP presentations should establish some form of seclusion or shielding (e.g., displayed only in

Third-order category: Drivers										Third-order category: Barriers				
Zero-Order Categories	Academic Support	Industry Support	First-Order Categories	Second-Order Categories	Zero-Order Categories	Academic Support	Industry Support	First-Order Categories	Second-Order Categories	Zero-Order Categories	Academic Support	Industry Support	First-Order Categories	Second-Order Categories
Effortless identification	No	Yes	Efficiency	Utilitarian	Proactive initiation	No	Yes	Trigger		Selling at any cost	No	Yes	Financial Overreaching	Exploitation
Save time	Yes	Yes			Need recognition	No	Yes			Price discrimination	Yes	Yes		
Enhance the product search process	Yes	Yes			Initiating inquiry	No	Yes	Co-creation		Manipulation	Yes	No	Decision autonomy	
Preselection of products	Yes	Yes			Process guidance	Yes	No			Paternalism	Yes	No		
Matching personal belongings	No	No	Effectiveness		Imperative contribution	No	Yes			Path-dependency	Yes	Yes		
Complementing considered product	No	Yes			Support activity	No	No			Talk with device	Yes	No	Technology humanization	Interaction Misfit
Narrowing actual search	Yes	Yes			Mobility	No	No	Device	Interaction	Interpersonal skills	Yes	No		
Facilitating shopping success	Yes	Yes			Secluded	No	No			Strange humanization	Yes	Yes		
Convenience	Yes	Yes	Simplicity		Perceived proximity	Yes	No			Human interaction	Yes	Yes	Interaction interface discrepancy	
Intuitive and easy usage	Yes	Yes			Target group	Yes	Yes	Content intimacy		Employee replacement	Yes	Yes		
Orientation in the store	Yes	Yes			Outer appearance	No	Yes			Fear of the new	Yes	No		
Price transparency	No	Yes	Pleasure through discounts	Hedonic	Based on lifestyle	Yes	Yes			Invasiveness	Yes	Yes	Identity disclosure	Privacy
Personal discount	Yes	Yes			Independence	Yes	Yes	Sales representatives		Unfamiliar retailer	Yes	Yes		
General discount	No	No			Unobtrusive	Yes	Yes			Personal data	Yes	Yes		
Stimulate imagination	No	Yes	Inspiration through technology		Approachability	yes	Yes			Transparent customer	No	Yes		
Serendipity	No	Yes			Universal knowledge	Yes	No			Data storage	No	Yes	Data handling	
Contextualize products	No	Yes			Proficiency	No	Yes	Technology's traits		Third-party disclosure	Yes	Yes		
Impulse purchase	Yes	Yes			Objectivity	No	No			Data breach	Yes	Yes		
Affirmation	No	No	Intrinsic satisfaction		Empathy	Yes	Yes			Feeling of being watched	Yes	No	Other customers	
Personal appreciation	No	Yes			Brand history offline	Yes	Yes	Past behavior	Integration	Under pressure	Yes	No		
Curated shopping	Yes	Yes	Experience		Brand history online	Yes	Yes			Overhear information	No	No		
Omnichannel	Yes	Yes			Third party online	Yes	Yes			Automatic recognition	No	Yes	Monitoring	
Interactivity	Yes	Yes			Shared information	Yes	No	In-store behavior		Lack of anonymity	Yes	Yes		
Entertainment	Yes	Yes			Demeanor	Yes	Yes			Tracking	Yes	Yes		
Appraisement	Yes	Yes	Self-revelation	Control						Surveillance	Yes	Yes		
Express permission	Yes	Yes								Inconvenient device usage	Yes	No	Hassle	Lack of Confidence

(*continued on next page*)

(*continued*)

Third-order category: Drivers										Third-order category: Barriers				
Zero-Order Categories	Academic Support	Industry Support	First-Order Categories	Second-Order Categories	Zero-Order Categories	Academic Support	Industry Support	First-Order Categories	Second-Order Categories	Zero-Order Categories	Academic Support	Industry Support	First-Order Categories	Second-Order Categories
Selective scope	Yes	No								Login effort	No	No		
Avoidance	No	No								Discrimination	No	No		
										Trust in competence	Yes	Yes	Technology skepticism	
										Immature technology	Yes	Yes		

Notes: Academic support (journal articles) comes from relevant literature streams (personalization, retail experience, smart retailing, technology acceptance, SST). Industry support (e.g., consultancy reports) comes from relevant literature streams (personalization, retail experience, smart retailing, technology acceptance, SST). All were published between 2015 and 2020.

private changing rooms).

5.2.5. *Support consumers' device choice*

Consumers seek convenient device uses that do not become too invasive, as detailed by the personal–retailer devices paradox. We recommend that retailers let each consumer choose whether to use their own device or a retailer-provided one. If they select their own device, the TEP efforts should still adopt an opt-in approach and emphasize the benefits of this communication channel for sensitive information (e.g., recommendations based on previous purchases) to avoid more public displays.

5.3. *Limitations*

This qualitative study represents a first step in understanding TEP and its implications for smart retailing; additional research is needed to address several of its limitations. First, grounded theory relies on the researcher's subjective interpretation of qualitative insights (Glaser & Strauss, 1967). Subsequent quantitative studies could offer more objective assessments of the effects of different drivers and barriers on TEP success. Second, our sample includes customers from one cultural background (Germany) and age group (millennial professionals). Investigating consumers with other cultural backgrounds might reveal divergent shopping behaviors and technology concerns related to TEP. Third, smart retailing is a novel phenomenon, sporadically implemented in retail practice, and accordingly, the respondents generally had not experienced TEP extensively. Their individually imagined responses thus might be biased, yet they are largely unavoidable for research into expectations of future technology. As TEP implementations grow more widespread, researchers should assess these manifestations and related consumer perceptions in the field (e.g., ethnographic research). Even before we reach that point though, expert opinions gathered through a Delphi study might predict and weight likely drivers, barriers, and future developments (Barnes & Mattsson, 2016). Fourth, our research scope does not encompass a detailed focus on consumers' perceptions of the technologies that enable TEP (e.g., augmented reality, service robots), though the interview respondents indicated divergent perceptions of TEP according to its instrumentalization. Accordingly, further, exploratory investigations could address the impact of the technology (interface) on consumers' TEP perceptions.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A:. Coding Results: Drivers and barriers (following Homburg et al., 2017)

Appendix B:. Overview of drivers and barriers

Categories	Description	Illustrative Statement
Drivers		
Utilitarian	Customers expect functional benefits with regard to efficiency, effectiveness, and simplicity of shopping.	"To support me and to reach my goal faster; this is how I could imagine it [TEP]" (ID03)
Hedonic	Customers expect positive emotional value from the pleasure resulting from discounts, inspiration through technology, intrinsic satisfaction, and the shopping experience.	"I think the interaction with technology can make the shopping experience more exciting. "(ID03)
Control	Customers expect to be in control of self-revelation, the TEP process, and the design of the content.	"I believe it is possible to receive a better and more precise personalization if I am actively involved in the process, for instance, if I am being asked what I am looking for today." (ID06)
Interaction	Customers perceive benefits from service interactions with and across devices, technologies, personal references in the content, and sales associates as personally desired.	"I think it [TEP] is interesting because it is more flexible and especially more objective than traditional sales consulting." (ID14)
Integration	Customers expect to derive value from personalization, mainly based on data originating from their relationship with a brand and their real-time in-store behavior.	"It would be even better if it knew what I needed…. This should be based on my purchase patterns I have with this retailer." (ID 10)
Barriers		
Exploitation	Customers fear being disadvantaged by the retailer through TEP.	"I think I would indeed have the fear that it [the technology] would even want to sell something more fiercely than a human being, even though this might sound stupid. Or that it would be only about selling in that sense.… Because a machine probably can be instructed more exactly [than a human being] to be efficient." (ID15)
Interaction Misfit	Customers' aversion to novel service interactions with and across devices, technologies, personal references in the content, and sales associates that are not aligned with their personal desire.	"It is not an appealing purchase experience when a robot drives toward me instead of a person, who walks toward me." (ID09)
Privacy	Customers' concerns of privacy invasions by other customers and the retailer.	"It would make me feel uncomfortable if all the others could tap into my name and my preferences." (ID 06)
Lack of Confidence	Customers' expected difficulty associated with enabling TEP and their expected doubt of the added value.	"Initially, I would have some doubts if the suggestions come from a technology. … It just lacks real-life experience. I am not sure if such a suggestion would add value." (ID 14)

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