The dilemma of playing it interactive: a cool but intrusive trend

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Abstract

To improve the in-store experience, physical retailers increasingly adopt in-store technologies (ISTs). However, questions are being raised about the use of these technologies, their ROI, and to what extent and how they affect the customer experience… for better or for worse. Studies tempering their adoption, or even tackling negative perceptions, of ISTs are rare, as the literature tends to emphasize their positive effects. This research then tackles the specific question of the impact of a proactive IST - namely, a robot - on the shopping experience. We suggest that the proactive nature of an IST could lead to a perceived coolness feeling as well as intrusiveness, which could lead to a paradoxical or ambivalent appreciation of such an IST. An experiment on 131 respondents is conducted, and findings indeed demonstrate parallel paths with both a positive influence of perceived coolness and a negative influence of perceived intrusiveness on attitude toward the shopping experience. Contributions of this work, managerial issues, limits and perspectives are then discussed.

Keywords

In-store technologies; Shopping experience; Coolness; Intrusiveness; Robot

Introduction

To improve the in-store experience and gain a competitive advantage over their competitors (Grewal et al., 2009), physical retailers have started adopting in-store technologies (ISTs). The COVID-19 pandemic accelerated the implementation of these technologies to reduce human contact. Retailers are also adopting them to reduce costs and improve productivity. This adoption of front office ISTs is profoundly transforming the sector, digitalizing the store (Hagberg et al., 2016, 2017) and changing its role in the omnichannel process (Bèzes, 2019; Blázquez, 2014).

Nevertheless, questions are being raised about the use of these technologies, their ROI, and to what extent and how they affect the customer experience (Picot-Coupey and Auffret, 2020)… for better or for worse. Studies tempering their adoption, or even tackling negative perceptions, of ISTs are rare, as the literature tends to emphasize their positive effects. This raises questions about how consumers perceive and experience a technology that the retailer implements. It is therefore important, from a practical and academic point of view, to examine this trend.

The conceptual framework of this research work first addresses the issues of ISTs, their impacts, and their (positive and negative) effects. We then consider a more balanced view of proactive interaction, through the coexistence of a positive "cool" path and a negative "intrusive" path. An experiment conducted on 131 respondents is then presented and findings are detailed. The conclusion part presents the contribution, limitations, and perspectives of this research work.

Conceptual framework, hypotheses, and research model

Retailers have widely integrated ISTs (Grewal et al., 2017), following the trend of technology-enriched stores and smart retailing (Pantano and Gandini, 2017). The boundaries between digital and physical are dissolving (Piotrowicz and Cuthbertson, 2014) and technology has become a dimension of the in-store experience (Alexander and Alvarado, 2017). The literature then commonly promotes ISTs (Adapa et al., 2020; Bertacchini et al., 2017; Blázquez, 2014; Foroudi et al., 2018; Pantano et al., 2017; Pantano and Gandini, 2017; Priporas et al., 2017; Roy et al., 2017, 2018, among others), and their benefits: improved shopping efficiency (Roy et al., 2017), experiential aspects (Pantano and Laria, 2012), value (Boudkouss and Djelassi, 2021; Feenstra and Glérant-Glikson, 2017), higher purchase intention (Willems et al., 2017), satisfaction (Fernandes and Pedroso, 2017) or advocacy intention (Lee, 2015).

However, retailer-initiated interactions with ISTs may be perceived as less natural than consumer-initiated interactions (such as using one's smartphone instore) (Belghiti et al., 2017; Bèzes, 2019). The literature points out that perhaps not all retailers have implemented ISTs well enough yet - according to consumers, who are easily bored by technologies that are not very interactive or responsive, being instead slow or useless (Alexander and Alvarado, 2017). The experience can be misleading, with the risk for these ISTs to be considered as gadgets (Antéblian et al., 2013; Bäckström and Johansson, 2017; Picot-Coupey and Auffret, 2020). Furthermore, ISTs embedded in the company-driven experience (Carù and Cova, 2006) generally require consumer action and participation (Dabholkar, 1996). However, overly soliciting customer participation, via interactive technology, could have a deleterious effect on the experience, generating an effort and even threatening consumer freedom (Feenstra and Glérant-Glikson, 2017).

The very definition of a connected store (Picot-Coupey, 2013) or phygital store (Belghiti et al., 2017) includes the idea of integrating interactive technologies into the

customer journey, and interactivity is then at the heart of the connected retail experience (Boudkouss and Djelassi, 2021; Feenstra and Glérant-Glikson, 2017). Definitions of interactivity (Jensen, 1998; Steuer, 1992) emphasize its participatory, real-time, and influential nature and literature identified the key dimensions of interactivity: synchronicity, perceived control, bidirectionality, responsiveness, and connectivity (Boudkouss and Djelassi, 2021).

Interactivity and its (often positive) effects have however been studied mainly in online commerce (Cyr et al., 2009; Hashish, 2019; Hoffman and Novak, 1996; Stenger, 2005; Teo et al., 2003) and would then deserve more attention in the physical store context (Boudkouss and Djelassi, 2021) that differs from the online context in terms of time/social pressure or interactions (human employees vs. ISTs). Furthermore, not all ISTs have the same level of interactivity: consumers cannot necessarily interact with AI or electronic labels, whereas a robotic assistant will be interactive through its proactivity, its movements to approach or follow the consumer, creating an impression of parasocial interaction and social presence (van Doorn et al., 2017). We are particularly interested in interactivity's dimensions of responsiveness - the ability of the technology to respond proactively to consumer needs, demands, and aspirations - and control – the extent to which the consumer feels to be in control of the interaction or to undergo it. We here focus on the service robot - that is the only proactive IST. We suggest that the proactive nature of an IST could lead to a perceived coolness feeling as well as to some perceived intrusiveness, which could lead to a paradoxical or ambivalent appreciation of such an IST.

"Cool" is a common expression of approval or appreciation. Coolness is a perception that has an evaluative component that coolness is positive and desirable, and it contains elements of uniqueness in terms of appearance and utility (Sundar et al., 2014). Moreover, coolness could arise from the authentically being "real" or "sincere" nature of the object itself in terms of improving users' life (Conan, 2008; Levy, 2006). Thus, we argue that a robotic shopping assistant, proactively approaching consumers and providing help, could generate a coolness feeling though such a "sincere" and helpful nature. Thus, we hypothesize that **H1: The proactive interactivity increases perceived coolness of technology.** Since coolness is positive and desirable, it increases the pleasure during consumer shopping journey. Thus, we hypothesize that **H2: The perceived coolness of technology increases attitudes towards shopping** experience. Consequently, we hypothesize that **H3: Proactive interactivity of technology leads to positive attitude towards shopping experience, mediated by perceived coolness of technology (path a)**.

In advertising, intrusiveness is defined as a perception or psychological consequence that occurs when an audience's cognitive processes are interrupted (Li et al., 2002). Much studied in the online advertising context, the role of intrusiveness of an IST in a physical context is little examined. Intrusiveness of technology can lead to negative perceptions of ease of use and usefulness (Lin and Kim, 2016), decreased trust in the technology (Sill et al., 2008), and feelings of irritation (Mccoy et al., 2008). There are two main dimensions of intrusiveness in technology: presenteeism (the degree to which technology enable individuals to be reachable) and technology anonymity (the degree to which technology enable individuals to be trackable and identifiable) (Ayyagari et al., 2011; Benlian et al., 2020). Thus, when customers are confronted with an IST acting proactively, this interactivity making people reachable and engage in interaction, which can be perceived as intrusive when unsolicited. We then assume **H4: The proactive nature of an IST positively influences the perceived intrusiveness of the technology.** Moreover, intrusiveness could result in harmful effects such as strain and interpersonal conflicts (Benlian et al., 2020). We argue that

intrusiveness at the presenteeism dimension, making consumers constantly aware of the presence of the technology, could lead consumers to perceive the shopping experience as negative. Thus, we hypothesize that **H5: Increased intrusiveness decreases consumer attitude towards shopping experience,** and consequently, **H6: Proactive interactivity of technology leads to negative attitude towards shopping experience, mediated by perceived intrusiveness of technology (path b).**

Methodology

To test our model (Appendix 1), an online experiment via Prolific was conducted in 2021, manipulating the degree of proactivity (proactive vs. non-proactive) of an IST, a robotic shopping assistant (Appendix 2). As a lab experiment was not possible given the pandemic situation, videos simulating a shopping journey and the two interaction conditions were shot in a first-person view in a lab simulating a convenience store, with the following scenario: "You are shopping in a grocery shop. You want to buy a chocolate bar for a friend. Watch the following video of your interaction with a robot in the shop." Engagement and social interaction with consumers is a key difference between robots and other ISTs (van Doorn et al., 2017). Previously, only salespeople could actively approach and guide consumers. Today, it is possible for robots to engage in such proactive behavior. This interactivity is therefore understood here through one of its distinctive features relating to responsiveness and control: the movement capability, as the robot is the only IST capable of approaching consumers in the same way as salespeople do. When this function is deactivated, the robot functions as a simple digital kiosk. Thus, in the proactive condition, the robot spontaneously approaches the consumer to offer help in choosing the product. In the non-proactive condition, the robot is fixed and it is the consumer who approaches it to use it. Each participant was randomly assigned to one of the two conditions and watched a 15-second video of the journey and interaction with the robot.

138 US residents were recruited from Prolific. However, as some failed our attention check questions, we have a total of 131 participants for the analysis (average age, 37.6 years; range 18-74; 45% female; SD=13.4; proactive condition n=66, non-proactive condition n=65). Immediately after viewing the video, participants were asked to complete the questionnaire for a fee. The model variables were measured using valid and reliable measurements from literature and presented in 7-point scales: overall attitude (Dabholkar, 1994) toward shopping experience, perceived intrusiveness (Li et al., 2002), and coolness (Sundar et al., 2014). Control and co-variables were also measured: the need for interaction (Dabholkar, 1996), innovativeness (Kirton, 1976), autonomy (Parvey and Sparks 2008, 2009), attitude towards technology (Rosen et al., 2013), product knowledge (Muller et al., 2008), perceived norm (Taylor and Todd, 1995), consistency of technology use with individual values (Beasley et al., 2014), perceived competency and friendliness (Fiske et al., 2002) of the robot, and WOM toward the retailer (ad hoc item). Familiarity with online gaming (mono-

item) was also controlled for, as gamers were more likely to be accustomed to the first-person view and therefore able to project themselves into the videos. The analysis of measures (validity, reliability) was satisfactory (Cronbach's alphas for all constructs were between 0.7 and 0.95)[1].

Findings

Manipulation check worked according to one-way ANOVA result ($F(1,130) = 36.65$, $p<0.001$), so that participants indeed consider the approaching behavior proactive, compared to the robot standing still at a corner. We then find that proactive interaction indeed could lead to positive coolness perception, but it could also lead to negative intrusiveness perception, harming the consumer shopping experience. None of covariates had significant effects on our results.

We first ran regression-based PROCESS MODEL 4 (Hayes, 2018) with two mediators. We run model 4 (5000 bootstraps, 95% confidence interval (N = 131)) with interaction type (proactive vs non-proactive) as the independent variable, perceived coolness and perceived intrusiveness as parallel mediating variables, and attitude towards shopping experience as the dependent variable. The direct effect is not significant, $c = -0.12$, $SE = 0.22$, $t = -0.58$, $p = 0.56$.

However, Process model 4 parallel mediation results indicate that interactivity does lead to an increase in perceived coolness, $b = 0.45$, $p = 0.06$, $SE = 0.24$. Thus, H1 is supported. Perceived coolness then leads to positive attitude towards shopping experience, $b = 0.28$, $p = 0.00$, $SE = 0.07$, supporting H2. 'Path a' results shows that interactivity leads to an increase attitude in shopping experience, mediated by perceived coolness, $b = 0.13$, 95% CI [0.0128, 0.2598], $SE = 0.08$. Thus, H3 is supported. However, coolness perception changes with time, as coolness fades away when something becomes mainstream (Goodman and Dretzin, 2001). The perception of cool is also socially constructed thus it is of unstable and temporal nature (Sundar et al., 2014). Assessing other – an potentially negative - impacts is then of great importance to evaluate long-term effects of implementing interactive technologies.

Regarding the negative path, the results indicate that interactivity does lead to increased intrusive feeling, $b = 1.24$, $p = 0.00$, $SE = 0.22$, supporting H4. Intrusiveness then negatively affects consumer attitude toward shopping experience, $b = -0.20$, $p = 0.02$, $SE = 0.08$, supporting H5. 'Path b' results shows that interactivity leads to a decrease in attitude toward shopping experience, mediated by perceived intrusiveness, $b = -0.24$, 95% CI [-0.4636, -0.0503], $SE = 0.13$. Thus, H6 is supported. When consumers are shopping in a retail store, they are immersed in their flow with control (Wang and Hsiao, 2012). The proactive interaction of the robotic shopping assistant can however disturb the flow since engaging with the robotic shopping assistant could be a form of a new challenge or hinder the existing challenges they are already in. Challenges and skills are antecedents of flow experience (Csikszentmihalyi and Csikszentmihalyi, 1992). Thus, the robotic shopping assistant disturbed or might have generated another flow experience. Such disturbance of flow could lead to consumers feel intruded and thus decreased overall attitude toward the shopping experience. Irritation and disturbance of flow experience caused by intrusiveness deserve attention from future research, as according to Wang and Hsiao (2012), as this could hinder shopping intention and sales.

Conclusion

1 Those results are not presented in detail given the limited size of the communication.

This work in progress examines the effect of proactive interaction/interactivity with an IST on consumer shopping experience in a physical retailing context. The literature suggests that consumers tend to adopt interactive environments only if it pays off (Steckel et al., 2005) and they tend to focus on the positive aspects of ISTs. We found that proactive interaction could lead to positive coolness perception, but it could also lead to negative intrusiveness perception, harming the consumer shopping experience. These parallel positive path and negative path contribute to a more nuanced understanding of retail stores' digitalization. As parallel mediation results indicated, once the coolness perception fades away, the negative path might outweigh the positive path, and implementing interactive technologies may backfire on the retailers, leading to other negative consequences, such as feeling forced (Feng et al., 2019; Reinders et al., 2008) to use the technology and possibly other negative consequences in terms of frequentation or image. Future study could explore such negative consequences.

A follow-up study may be helpful to examine what moderates each path, as well as the long-term consequences of intrusiveness, especially exploring its potential impact on perceived forced use (Reinders et al., 2008) and other negative consequences. New experimental studies are envisaged to continue this research work since this study is currently constrained by the difficulty of conducting field experiments, as well as limited by the small number of participants and the video scenarios created. A series of experiments exploring boundary conditions on both the positive and negative path will be progressively conducted in a store-lab, following this first study. As this research was conducted on a US-based sample, it is also necessary to replicate it on other national/cultural samples, as social and cultural perceptions of the technology are likely to vary. Further consequences also remain to be examined: impact on dimensions of shopping and purchase behavior, perceived value, attitude towards the shop and the retailer, short and long-term consequences, moderating role of personal values or purchase orientation, among others.

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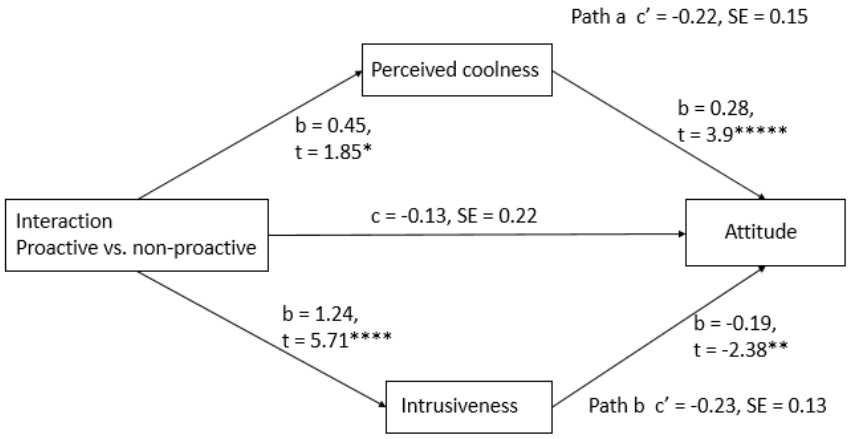
Appendix 1. Research model and findings



Note: * p < .1, ** p < .01, *** p < .001, **** p < .0001

Appendix 2. The robotic shopping assistant

The robotic shopping assistant consists of a digital kiosk-type screen attached to a mobile base which movements can be programmed or controlled remotely. The retailer brand name visible in this illustration did not appear on the experimental videos, to avoid any bias linked to a priori knowledge or attitude towards the brand.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