Striking a balance: Information sensitivity in smart retailing and consumer responses

Lelis Espartel IADE - Universidade Europeia Simoni Rohden NOVA Information Management School (NOVA IMS)

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Abstract:

This study explores the impact of information sensitivity on consumer behavior in smart retailing contexts. Findings reveal that consumers perceive different levels of sensitivity in information requests, influencing their willingness to disclose data, use technology, and satisfaction levels. Risk perceptions and suspicion emerge as explanatory mechanisms, indicating that perceived risks and doubts about company motives intensify the negative effects of sensitivity. Managerially, companies must balance leveraging customer information with respecting privacy concerns. Strategies like transparency policies and providing options for sharing basic versus sensitive data can mitigate consumer apprehensions.

Keywords: *privacy concerns; retail technology; consumer decision-making*

1. Introduction

Retailers are employing smart technologies to remain competitive, personalize the experience (Scholdra, Wichmann, and Reinartz, 2023), and improve consumers' journey (Priporas, Stylos, and Fotiadis, 2017). The concept of smartness extends beyond the mere intelligent application of new technologies, as it encompasses innovations in processes and other dimensions to make retail activity smarter by redefining the roles of companies, employees, and consumers in the service economy (Pantano et al., 2022). These technological innovations apply to both online and physical formats and bolster omnichannel strategies (Grewal et al., 2023).

For companies, smart retail technologies allow more accurate resource management, while also fostering the development of well-targeted and personalized experiences, potentially increasing sales and consumer loyalty. On the other hand, consumers stand to gain from smart retailing through tailored offers that simplify decision-making and have an enjoyable and seamless shopping journey across multiple marketing channels (Puntoni et al., 2021).

For consumers to engage with smart technology in retail, it is common for companies to request some personal data (Scholdra et al., 2023). Moreover, consumers need to perceive the value of using this technology throughout their shopping journey and recognize that its integration can enhance overall satisfaction (Kim, Wang and Roh, 2021). Consequently, both the willingness to disclose personal data and the willingness to use the technology are important factors influencing consumer adoption. Willingness to disclose refers to consumers sharing their personal information with companies, while willingness to use corresponds to their inclination to employ technology during their purchasing journey (Hayes et al., 2021; Moriuchi, 2021). Alongside intentions to use the technology provided by retailers, there is a growing emphasis on intentions to share information, particularly with the rise of artificial intelligence in smart retail contexts. Although artificial intelligence offers numerous benefits, it also raises concerns regarding consumer privacy (Huang and Rust, 2022).

Whether influenced by news concerning data privacy or by negative experiences shared by family and friends, consumers may perceive risks associated with providing their personal data (Al-Natour, Benbasat, and Cenfetelli, 2021) and become more suspicious of retailers, either online or offline (Pantano et al., 2022). Particularly in retailing, the discussion seems to be mostly related to disclosure, consent for data usage, and the utilization of e-commerce platforms (Scarpi, Pizzi, and Matta, 2022). Despite some level of comprehension regarding the benefits offered by technology, consumers are skeptical about the security of their data (Moriuchi, 2021). Those consumers who are suspicious of a company's ulterior motives may exhibit resistance to persuasion attempts or even opt to avoid employee interactions (DeCarlo, Laczniak and Leigh, 2013).

Previous studies have already shown that the level of personally identifiable information and how private this data is perceived to be, impact how sensitive one considers personal information (Markos, Labrecque, and Milne, 2018). Furthermore, when brands request sensitive information from consumers it mitigates the positive effects of personalization and consequently consumers are less likely to self-disclose personal information (Mothersbaugh et al., 2012). Despite that these studies refer to the influence of information sensitivity on self-disclosure intentions, they have not explicitly examined the adoption of new technologies in retail environments, nor have they assessed the impact of sensitivity on additional consumer responses, such as technology adoption and satisfaction with the overall shopping experience.

This research aims to examine the influence of information sensitivity on consumers' willingness to disclose personal data, their willingness to use technology, and their

satisfaction with the overall experience. Additionally, we seek to assess the impact of risk perception and suspicion toward the retailer on these relationships. We hypothesize that varying levels of perceived sensitivity regarding personal information yield distinct consumer responses, with perceived risk and feelings of suspicion serving as explanatory mechanisms for these differences. To test our hypotheses, we conducted both a pre-test and an experimental study, collecting data via the Prolific platform.

2. Literature Review and Hypotheses

2.1. Information sensitivity

Data sensitivity is dependent on the perceived intimacy of the information by the individual. When there is a vulnerability to loss resulting from information disclosure, it is perceived as more sensitive (Mothersbaugh et al., 2012). The level of sensitivity attributed to specific information is consequently linked to potential threats to privacy; for example, disclosing one's gender is generally regarded as less sensitive compared to disclosing medical records (Okazaki et al 2020).

Customers typically exhibit a protective stance toward their personal information, especially when it is perceived as sensitive (Aiello et al., 2020). The gathering of more sensitive data can evoke perceptions of diminished control over the information shared with brands, raise concerns about the potential misuse of information by companies (Pantano et al., 2022), or mitigate personalization benefits (Mothersbaugh et al., 2012). Moreover, the request for sensitive information often leads consumers to perceive their relationship with the company as less warm (Aiello et al., 2020).

The literature suggests that the level of sensitivity associated with certain information is shifting (Markos et al., 2018), nevertheless, consumers tend to prioritize safety in digital interactions (Priporas et al., 2017). Furthermore, when embracing new technologies, individuals may consider not only their ease of use and functionalities but also the perceived threats that interactions with technology may entail (Agardi and Alt, 2022).

2.2 Willingness to disclose information and to use the technology

The willingness to disclose personal information denotes the user's intention to share data with companies and third parties (Huang and Rust, 2022). Factors such as increased trust in the company, perceived control over data, brand familiarity, perceived sensitivity of shared data, emotional attachment, and perceived benefits are among the elements that can influence consumers' intention to engage in self-disclose behaviors (Kopalle et al., 2022).

In retailing contexts, individuals may disclose personal information to a salesperson or when interacting with technology. AI technologies, for instance, often gather and analyze a large amount of personal data disclosed by users. Self-disclosure can improve one's experience by enabling personalization based on the shared information. However, there is a downside associated with the safety of this personal information (Kopalle et al., 2022). Consumers share their information with the expectation that organizations will maintain minimal ethical standards regarding information use; therefore, privacy concerns remain a critical aspect of the data-driven marketplace (Bandara, Fernando and Akter, 2021).

Disclosure intentions differ from usage intentions, as the latter refers to how much a consumer is willing to adopt or engage with new technology, whereas the former solely concerns the sharing of data, irrespective of technology use. Technology usage intentions are often influenced by the ease of use and perceived usefulness of the technology (Venkatesh and

Davis, 2000). In other words, consumers aim to strike a balance between technology performance and the effort required to use it (Vitezic and Peric, 2021). Additionally, intentions to adopt new technology are influenced by factors such as consumer trust in the company and privacy concerns (Moriuchi, 2021).

The disclosure of personal information tends to correlate with the sensitivity of that information, with higher sensitivity leading to a decreased intention to share personal data (Mothersbaugh et al., 2012). Additionally, familiarity with the company requesting the information and the nature of the information (public versus private) can also influence intentions for self-disclosure (Markos et al., 2018). Despite a consistent body of literature suggesting the impact of information sensitivity on self-disclosure, it was mostly focused on online interactions with e-commerce platforms, or digital influencers (Aiello et al., 2020; Markos et al., 2018). Furthermore, less attention has been devoted to the willingness to use the technology. Exceptions are studies that consider the intention to use new technology as an outcome of the privacy paradox, where individuals weigh the benefits and risks associated with their choice; in this scenario, information sensitivity is linked to potential risks (e.g., Pentina et al., 2016). Given the extensive literature on disclosure intentions, we propose adopting a similar rationale for usage intentions and suggest the following hypothesis:

H1: Information sensitivity will negatively influence (a) the willingness to disclose personal data and (b) the willingness to use the retailer's technology.

2.3 Satisfaction with the experience

Consumer satisfaction refers to the evaluation of the benefits received by the company and what the consumer expected (Oliver, 1981). The more the product or service exceeds consumer's expectations, the more satisfied they tend to be. Satisfaction may stem from both the ultimate performance of the product and the overall consumption experience, which can be influenced by technology. Experiences have become pivotal in understanding consumer behavior, as they can contribute to brand awareness, brand loyalty, and stronger brand relationships (Mishra, Jha, and Nargundkar, 2021).

When embracing new technologies, such as augmented reality, user's control over information privacy influences their satisfaction with the experience (Poushneh and Parraga, 2017). Further research on mobile applications has confirmed that perceived privacy protection positively affects consumer satisfaction (Kim et al., 2021). Building upon these insights, we can infer that when more sensitive information is required to use an in-store technology, consumers may perceive a greater threat to their privacy, therefore leading to a negative impact on their satisfaction with the experience. Therefore, we propose the following hypothesis:

H1c: Information sensitivity will negatively influence consumer satisfaction with the experience.

2.4 Risk

The decision to engage in self-disclosure behaviors involves an assessment of the risks and benefits associated with such actions (Al-Natour et al., 2021). This "privacy calculus" involves analyzing the anticipated benefits and costs stemming from information sharing (Hayes et al., 2021). The benefits may include personalized consumer experience, while the risks could be related to data breaches or other privacy issues.

A lack of transparency or control regarding how retailers use data can influence consumers' perception of privacy risks (Martin and Palmatier, 2020). Potential threats to privacy or risk perceptions not only reduce intentions to use the technology (Moriuchi, 2021;

Mombeuil and Uhde, 2021) but also decrease consumer propensity to engage in selfdisclosure behavior (Hayes et al., 2021).

The more sensitive information is perceived to be, the riskier the act of sharing it with third parties, due to potential losses it may cause (Mothersbaugh et al., 2012). In some cases, consumers may even feel more comfortable sharing sensitive information with artificial intelligence than with humans due to the risks associated with self-disclosure (Kim et al., 2022). Hence, we propose the following:

H2: Risk perception will mediate the relationship between information sensitivity and (a) willingness to disclose personal data, (b) willingness to use the retailer's technology, and (c) satisfaction with the experience.

2.5 Suspicion

Suspicion is associated with being skeptical about the motives of a third party (Griffiths, 2014). It represents a state in which individuals consider potential attributions regarding the motives of another person (DeCarlo et al., 2013). Consumer suspicion arises when individuals suspect that certain actions or information provided by a company are not genuine or are deceptive (Kollmer, Eckhardt, and Reibenspiess, 2022). Consumers may feel suspicious about the approach or offers presented by a salesperson (DeCarlo et al., 2013), when shopping online from an unfamiliar vendor (Moody, Galletta, and Lowry, 2014), about an online review written by another customer (Kollmer et al., 2022), or about new technologies (Moriuchi, 2021; Mombeuil and Uhde, 2021).

There is significant skepticism regarding the transparency of companies that adopt new technology and how they handle consumers' data (Mombeuil and Uhde, 2021). When individuals' perceived security suspicion decreases, it may increase their perception of the utility and effectiveness of the technology (Moriuchi, 2021). Similarly, enhanced feelings of suspicion regarding new technology are usually related to consumers' reduced intentions to adopt this technology (Fernandes and Oliveira, 2021). Suspicion may also influence purchase intentions, consumer satisfaction and trust (DeCarlo et al., 2013; Kollmer et al., 2022).

Previous literature suggests that when the sensitivity of information in consumption situations is high, consumers may experience enhanced feelings of risk or suspicion (Bandara et al., 2021). Therefore, we expect that feelings of suspicion regarding the company's motives and the usage of personal data will serve as an explanatory mechanism for the relationship between the level of information sensitivity and consumer responses. Therefore:

H3: Suspicion feelings will mediate the relationship between Information sensitivity and (a) willingness to disclose personal data, (b) willingness to use the retailer's technology, and (c) satisfaction with the experience.

Figure 1 summarizes the hypothesized relationships between the constructs.



Figure 1: Conceptual Model

3. Experimental Study

Before conducting the experimental study, we ran a pre-test to verify the level of sensitivity individuals associate with various types of personal information that might be requested during a retail interaction. This pre-test was administered via Prolific and involved 48 respondents (M_{age} = 39 years old, 50% female), and the results confirmed that there were no significant issues regarding respondents' understanding of the presented scenario.

The analysis of information sensitivity perception, using a 7-point Likert scale where 1 represented "not sensitive at all" and 7 represented "extremely sensitive", revealed that all types of information were perceived as somewhat sensitive. The most sensitive information was providing one's address to the company, followed by sharing a picture, providing information about social media accounts, phone numbers, and e-mail, while the least sensitive information included elements such as weight and age (Table 1).

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Information	Mean	Std. Deviation
Address	6.35	1.194
Picture	6.04	1.368
Social media	5.77	1.309
Mobile number	5.67	1.326
E-mail	4.87	1.696
Weight	4.38	1.841
Age	4.21	1.713

Table 1: Descriptive statistics about information sensitivity perceptions

Given that e-mail is frequently requested by retailers during consumer interaction, we categorized it as an example of less sensitive information. On the other hand, we considered pictures and social media accounts as examples of more sensitive information. We opted not to include the address as sensitive information because requesting someone's address in a face-to-face retail interaction might appear less realistic. Based on these results, we designed our experimental study.

To test the hypothesis, we conducted a between-subjects single-factor experiment wherein we manipulated the information required by a company. The scenario depicted a situation where consumers visited a retail store to purchase a sweater. At the store, consumers had the option to use a touch-screen digital kiosk to explore various sweater designs, colors, and available sizes. To access this technology, respondents were informed that they would need to provide personal information. In the low sensitivity condition, they were required to provide their e-mail address, while in the high sensitivity condition, they were asked to provide their e-mail address, face picture, and social media account to use the digital kiosk.

After seeing the scenario, participants responded to measures assessing willingness to disclose (α = .91; Wang et al., 2017), willingness to use (α = .92; Vitezic and Peric, 2021), experience satisfaction (α = .93; Lin and Hsieh, 2007), perceived risk (α = .87; Hayes et al., 2021), suspicion (α = .93; Moody et al., 2014), perception of organizational care about data privacy as a control variable, and demographic information.

The experiment was conducted on Prolific with 216 participants (M_{age} = 42 years old, 51% female). A total of 111 respondents were assigned to the condition that required only an email to use the technology, representing a less information-sensitive situation. Meanwhile, 103 respondents were allocated to the more information-sensitive condition, where they were

informed that to use the technology they would need to provide their email, social media account, and a picture. There was no significant difference between the groups in terms of how much respondents perceived that the company cares about customer's personal information (F= 1.84, p=.177).

Respondents who saw the scenario where the company requested only their e-mail to use the technology perceived this request as less information-sensitive (M=4.50, SD=1.57) compared to respondents who were asked to provide their email, picture, and social media account (M=5.24, SD=1.46). This difference was statistically significant (F=12.56, p=.001).

An ANOVA confirmed the main effects, supporting H1a, H1b e H1c. The level of sensitivity associated with the information required by the company influences willingness to self-disclose (F= 10.65, p= .001), with higher information sensitivity resulting in lower levels of intentions to share personal data (M_{low} = 2.88, SD= 1.48; M_{high} = 2.25, SD= 1.36). A similar effect was observed regarding willingness to use the technology (F= 10.81, p= .001); individuals in the more sensitive information condition were less prone to use the in-store digital kiosk (M_{low} = 3.53, SD= 1.59, M_{high} =2.85, SD= 1.42). Finally, the results indicated that requesting customer information perceived as more sensitive also impacts satisfaction with the purchase experience (F= 8.99, p= .003), with individuals who saw the scenario with less sensitive information reporting higher satisfaction levels (M_{low} = 3.07, SD= 1.44, M_{high} = 2.48, SD= 1.47).

To investigate potential explanatory mechanisms for these effects, we examined the impact of the level of information sensitivity on consumer's perceptions of risks and suspicion towards the company. The results confirmed that when a company requests more sensitive information, it influences risks associated with the operation (F= 6.44, p= .012), with the situation being considered riskier when more sensitive information is requested (M_{low} = 4.70, SD= 1.24; M_{high} = 5.14, SD= 1.33), supporting H2a, H2b, and H2c. Similarly, requiring more detailed personal information triggers suspicion about the company's intention regarding the use of this data (M_{low} = 4.11, SD= 1.40; M_{high} = 5.60, SD= 1.37), supporting H3a, H3b e H3c.

Based on these results, we ran a mediation analysis using Model 4 of the Macro Process. The results revealed that risk perceptions decrease willingness to self-disclosure behaviors (b= -.40, t= -5.69, p= .001), reduce intentions to use the technology (b= -.41, t= - 5.35, p= .001), and diminish the satisfaction associated with the experience (b= -.40, t= -5.52, p= .001). In all three dependent variables, there is a partial mediation of risk perception, with a negative indirect impact of information sensitivity levels on willingness to self-disclose (b= -.12, CI -.23 to -.03), intentions to use the technology (b= -.11, CI -.22 to -.03), and satisfaction with experience (b= -.12, CI -.23 to -.02).

Furthermore, when we consider how suspicious respondents feel about the company as a mediator, there is a significant impact on willingness to self-disclose (b= -.39, t= -5.98, p= .001), intentions to use the technology (b= -.40, t= -5.79, p= .001), and satisfaction (b= -.45, t= -6.85, p= .001). The partial mediation of suspicion was confirmed with a significant indirect effect of information sensitivity levels on willingness to self-disclose (b= -.13, CI -.24 to -.04), intentions to use the technology (b= -.13, CI -.24 to -.03), and satisfaction with experience (b= -.15, CI -.27 to -.04).

4. Conclusions

Consumers nowadays demand unique, exciting, and personalized experiences in their purchasing journey (Puntoni et al., 2021), which can be provided by technology in interactions with brands and companies. However, engaging with new technologies in smart

retailing contexts can present challenges for consumers, including privacy concerns regarding the sensitive information often required by brands for clients to access new in-store tools and technologies, such as digital kiosks or smart mirrors.

This article aimed to further understand the impact of requesting information perceived as more sensitive on consumers' responses, including willingness to engage in selfdisclosure behaviors, willingness to use the technology, and satisfaction with the experience. An experimental study confirmed that consumers indeed perceive different information requests as having varying levels of sensitivity. Furthermore, the more sensitive the information, the less willing consumers are to use the technology and share personal data, leading to lower levels of satisfaction. Perceptions of risk and a sense of suspicion towards how the company will use the collected information were identified as mechanisms that help explain these effects.

This paper contributes to the literature on consumer behavior in smart retailing contexts in three key ways. First, the results shed some light on the influence of information sensitivity perceptions on consumer behavior. While some studies have already suggested the impact on self-disclosure intentions (Aiello et al., 2020; Mothersbaugh et al., 2012), previous research has not specifically targeted the use of technology in retailing settings. To the best of our knowledge, this is the first study connecting traditional in-store experiences that require sensitive information and consumers' willingness to share personal data with the company.

Second, in addition to focusing on willingness to disclose, this research also deepens our understanding of the influence that information sensitivity has on willingness to adopt technology and on satisfaction. While it is known that intentions to use new technology result from assessing factors such as ease of use and usefulness, these results suggest that secondary aspects of technology use, such as the information requested from the customer, can also influence their propensity to use the technology. Information sensitivity is related to the potential risks associated with sharing information (Pentina et al 2016), making it crucial to shed some light on the implications of sensitivity perceptions beyond disclosure.

Third, this research also examines explanatory mechanisms for these main effects, where risk perceptions and suspicion feelings emerge as two outcomes of perceiving a situation as more sensitive. As a result, perceiving the situation as riskier or questioning the company's ulterior motives for requesting more personal information enhances the negative impact of sensitivity on consumer responses (DeCarlo et al., 2013).

From a managerial standpoint, some information, such as a consumer's mobile phone number or social media account, can be very helpful for marketers. This data can facilitate product segmentation, enable tailored offers, and even personalize the shopping journey. However, research findings indicate that companies should exercise caution regarding the type of information they request from customers. Despite consumers recognizing the benefits offered by technology to some extent, they remain skeptical about the security of their data (Moriuchi, 2021). Hence, companies must find a delicate balance between using customer information for marketing purposes and honoring consumer privacy concerns.

For example, consumers who are suspicious about a firm's underlying motives may exhibit resistance to persuasion efforts or even avoid interactions with company employees (DeCarlo et al., 2013). One approach to address this issue is to adopt a policy of transparency. Companies should provide clear explanations regarding the intended use of data and outline the measures taken to safeguard individuals' privacy. Moreover, in situations where more sensitive information is requested, companies could offer consumers the option to share only basic information (e.g., e-mail) rather than more invasive and sensitive details (e.g., mobile phone number or facial picture).

It is possible to identify some limitations in the study. First, our research focuses on risk perception and feelings of suspicion to understand the influence of information sensitivity

on consumer responses. Future investigations could enhance this understanding by including personal traits such as skepticism or even algorithm aversion into the model. Additionally, the perceived sensibility of the same information may vary across different cultures.

Moreover, we employed a scenario involving varying degrees of sensitivity, with one piece of information (email address) considered less sensitive, and three pieces of information (email address, facial picture, and social media account) considered more sensitive. It would be intriguing to investigate whether the amount of information requested by the retailer influences the perception of sensitivity. Lastly, our research focuses on one technology in a smart retailing setting (e.g., digital kiosk), future research could compare the impact of different technologies such as smart mirrors or robots.

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