# Emotions Effect on Shopper Behavioral Responses in AI-Powered Retail Stores

## INTRODUCTION

Technology-driven offline shopping is erasing the line separating physical and digital worlds. To compete with each other, websites are behaving like stores, but many stores are now mimicking websites (Kelly 2020). Artificial intelligence (AI) technologies are playing a crucial role in this intersection between offline and online trade. AI is reinventing the retail landscape by using computer vision and machine learning systems to facilitate tasks like promotion customization, intelligent display ads, smart shelving, and easy store check-out (Huang and Rust 2021; Grewal et al. 2021). However, implementing AI technologies costs companies a lot of time and money (Moore 2018), and the expected satisfactory results are not always guaranteed. Therefore, it is important to figure out how consumers are going to perceive these AI technologies. Examining consumer reactions helps retailers to elect what technologies to roll out, and what features to add/avoid in these technologies. In this context, considering the consumer emotional side when investigating the use of AI technologies in retail stores is crucial because (1) the emotional content of technology is found to influence several behavioral responses in retail stores like purchase intentions, product-quality perceptions, and willingness to pay (Garaus et al. 2021); (2) marketers oftentimes manipulate consumer emotions to boost consumption/use or improve a particular behavior (Cavanaugh et al. 2015), and are aware of the need to understand and portray emotions by using AI technologies (Hoyer et al. 2020).

While some AI technologies enhance the utilitarian side of the shopping experience by focusing on transaction moments like price checking, other AI applications boost both utilitarian and hedonic values (Kelly 2020). The emotional side of the AI-based consumer experience could be more relevant when focusing on hedonic values. However, the interaction level between consumers and AI technologies can also predict to which extent it is required to consider consumer emotions (Huang and Rust, 2021). The current study focuses on AI technologies that are applied in retail stores and involve high levels of interaction with shoppers. Moreover, introducing AI systems in retail environment is expected to trigger different positive and negative emotions. Therefore, this paper aims to investigate the effect of positive (interest and enjoyment) and negative (sadness and anger) emotional states on shopper attitude, behavioral and positive Word-of-Mouth (WoM) intentions. Based on the findings, this study is expected to illustrate the influence of four emotional states on consumer behavior in the setting of AI-based retail stores. Moreover, this study aims to provide practitioners with recommendations on considering emotions when implementing AI-driven technologies in retail stores.

## THEORETICAL FRAMEWORK

### AI in Marketing and Retail Research

AI roles and implementations are well recognized in marketing and retail research (Loureiro et al. 2021). At in-store level, an example of AI application is the use of robots to enhance shopper experience; van Pinxteren et al. (2019) studied the effect of a Pepper humanoid service robot and found that interaction comfort with the robot "moderates the effect of gaze cues on anthropomorphism". Similarly, Silva and Bonetti (2021) investigated consumer attitudes towards the tendency to interact with digital humans in fashion stores and demonstrated that customers prefer to interact with AI digital humans by voice or text compared to gestures. Song and Kim (2020) found that social intelligence perceived characteristics positively influence the adoption of robot advisors in fashion stores. Pillai et al. (2020) built on the Technology

Readiness and Acceptance Model and concluded that optimism, innovativeness, and insecurity of AI technologies influence customer intention to shop at AI-powered retail stores. Apart from the intention to shop/buy, research has investigated the effect of AI on other behavioral responses like customer satisfaction, engagement, and loyalty. In this vein, Prentice et al. (2020) found that AI-driven information and system qualities impact on customer satisfaction and engagement.. By the same token, Prentice and Nguyen (2020) suggested that AI-driven service experience impacts both customer engagement and loyalty. Concerning AI and consumer emotions, emerging AI systems enable retailers to track and recognize customer emotional states, and analyze their sentiments (Räikkönen and Grénman 2020). For example, Vo et al. (2018) referred to the ability of AI to recognize and analyze anger levels in someone's voice. Puntoni et al. (2021) acknowledged the need to evaluate AI data captured by consumers and indicated that future research should focus on understanding consumers' affective responses.

**Shopper Emotions in Retail Studies**

Retail environment components including atmospherics, personnel, and recreational factors elicit different positive and negative emotional states from shoppers, which in turn influence consumer behavioral responses (Babin and Darden 1996; Lunardo and Saintives 2018). In this vein, positive and negative emotions are triggered by store environmental variables and influence willingness to buy (Baker et al. 1992), desire to stay, satisfaction (Elmashhara and Soares 2020), shopper attitude, purchase intention (Kim et al. 2020), and loyalty (Loureiro and Roschk 2014). As for AI and consumer emotions in general, Longoni et al. (2019) indicated that resistance to AI is higher for consumers who perceive themselves as more unique, and De Bruyn et al. (2020) suggested that improving AI's ability to recognize and mimic consumer emotions needs to be considered as a solution to mitigate consumers' refusal. However, there is scarce empirical research that considers the effect of AI on consumer emotions in retail stores, and the effect of these emotions on shopper behavioral responses. Based on that, Bock et al. (2020) stressed the need for more studies on whether AI applications influence customer emotions and behaviors differently from traditional service modes. AI technologies could positively or negatively influence the customer experience by invoking different positive or negative emotions. This study focuses on how introducing AI in a retail store affects shoppers' positive/negative emotions (namely, interest, enjoyment, sadness, and fear), which, in turn, influence behavioral and positive WoM intentions through attitude. It is worth mentioing that this study considers both sides of attitude; hedonic and utilitarian (Voss et al. 2003). The pilot study section clarifies the decision behind choosing the aforesaid emotional states for this study. Based on the previous discussion the following hypotheses are proposed:

**H1a**: Positive/negative shopper emotional states triggered from consumer-AI interaction in the retail store positively/negatively influence the shopper utilitarian attitude.
**H1b**. Positive/negative shopper emotional states triggered from consumer-AI interaction in the retail store positively/negatively influence the shopper hedonic attitude.
**H2**. Positive/negative shopper emotional states triggered from consumer-AI interaction in the retail store positively/negatively influence shopper behavioral intention.
**H3**. Positive/negative shopper emotional states triggered from consumer-AI interaction in the retail store positively/negatively influence shopper positive WoM intention.
**H4a**. Utilitarian attitude toward the use of AI in retail stores mediates the relationship between shopper emotional states and behavioral intention.
**H4b**. Hedonic attitude toward the use of AI in retail stores mediates the relationship between shopper emotional states and behavioral intention.

**H5a**. Utilitarian attitude toward the use of AI in retail stores mediates the relationship between shopper emotional states and positive WoM intention.
**H5b**. Hedonic attitude toward the use of AI in retail stores mediates the relationship between shopper emotional states and positive WoM intention.

## METHOD

### Pilot study

Research that considers the effect of both positive and negative emotions is divided into two mainstreams. Perspective 1 includes studies that treat each type of emotion (positive or negative) one-dimensionally (e.g., Ferrarini et al. 2010). Perspective 2 includes studies that treat each type of emotion multi-dimensionally. This research adopts this perspective and separately measures each emotional state from the same type. The adopted perspective allows understanding the exact role of each emotional state, whether it is positive or negative. Bagozzi and Moore (1994) indicated that separate positive and negative emotional dimensions are more useful for understanding consumer reaction. Since the empirical study relies on a survey for data collection, for conciseness sake I decided to investigate the effect of only two positive emotions and two negative ones. To choose the four emotions, I proceeded as follows: (1) using all the emotional states referred in Mehrabian and Russell (1974), Izard (1977), Plutchik (1980), and Diener et al. (1995), I prepared two lists: one for the positive emotional states (love, joy, pleasure, interest, and trust), and the other for the negative emotional states (fear, anger, sadness, guilt, shyness/shame, and contempt). (2) I did six interviews with consumer beahvior researchers asking "What positive/negative emotional states might be influenced the most by the use of AI technologies in retail stores?" Based on the pilot study, the four emotional states of interest, enjoyment, sadness, and anger were selected to represent and measure the positive and negative emotions in the empirical study as they were nominated as the most influential based on the six interviewees.

### Empirical Study

The empirical study was conducted with consumers aged between 18 and 45 years old. The respondents were asked to watch a video about an AI-driven digital retail experience. Next, the respondents were asked to fill the questionnaire based on the video they had watched, starting from their personal reaction to the technology shown there. Izard's (1977) emotional scale was used to measure the four studied emotional states. Then the participants were asked about their hedonic and utilitarian attitudes towards the technologies (Scale: Voss et al. 2003), and also about behavioral (Scale: Oliver and Swan 1989) and WoM (Scale: Arnett et al. 2003) intentions triggered by these technologies. In the end, participants were asked to repor their demographics.

## RESULTS

The data collection process resulted in a sample of 338 individuals; around 59% of them are females. More than 39% are married or in a domestic partnership. To test the proposed model, firstly the model fit was tested by performing Confirmatory Factor Analysis (CFA): $\chi 2$= 497.464, df = 268, $\chi 2$/df = 1.856, CFI = 0.968, TLI = 0.961, IFI = 0.968, RMR = 0.064, SRMR = 0.0364, RMSEA = 0.050 [90% CI = 0.043; 0.057]; secondly, Cronbach's α (ranged between 0.788 and 0.929) and composite reliability (stretched from 0.794 to 0.931) were measured to confirm internal reliability of each scale used. Moreover, both convergent validity and discriminant validity were also tested by calculating Average Variance Extracted (AVE) (varied

from 0.57 to 0.79) and the square root of each AVE, respectively. Finally, to test the direct and mediating hypotheses, the Structural Equation Modeling (SEM) of path analysis was applied.

Regarding the direct hypotheses, regression weights demonstrate that both positive emotional states of interest and enjoyment influence the utilitarian side of the attitude, while the negative emotional states of sadness and anger do not. The same result is shown when considering the hedonic side of the attitude instead of the utilitarian; positive emotional states have an impact on hedonic attitude while the negative emotional states do not — thus, H1a and H1b are partially supported. Concerning the direct effect of the emotional states on behavioral responses, none of the studied emotions demonstrated a significant effect on behavioral or positive WoM intentions — hence, both H3 and H4 are not supported. In terms of the mediating role of shopper attitude, the findings demonstrates the mediation effects in which the utilitarian attitude shows a significant mediating role only in the paths from each positive emotional state to behavioral intention. The utilitarian side of the attitude did not play the same mediating role between these two emotional states and positive WoM intention. Moreover, utilitarian attitude did not play any mediating role when considering the negative emotions of sadness and anger — thus, H4a is partially supported, while H5a is not supported. The hedonic attitude shows a significant mediating role in the four paths between each positive emotional state and each studied outcome, namely interest to behavioral intention, interest to WoM intention, enjoyment to behavioral intention, and enjoyment to WoM intention. As with the utilitarian attitude, the hedonic attitude did not show any significant mediating role between any of the studied negative emotional states, on one hand, and the behavioral and WoM intentions, on the other — thus, both H4b and H5b are partially supported.

## CONCLUSIONS

This research relies on a pilot study to identify four influential emotional states (two positives and two negatives) when consumers interact with AI technologies in retail stores, and then it uses a survey to investigate the effect of these emotional states on shopper attitude, behavioral and positive WoM intentions. In sum, the pilot study advocated the emotional states of interest, enjoyment, sadness, and anger to be triggered by in-store consumer-AI interaction. However, the empirical study suggested the significant role of just the positive emotional states when focusing on behavioral and positive WoM intentions. Specifically, the study indicated that interest and enjoyment directly impact on attitude, indirectly on behavioral intention through hedonic and utilitarian attitude, and indirectly on positive WoM through hedonic attitude only.

Theoretically, this research contributes in several ways to the extant literature on emotions, AI, service, and consumer research with regard to shopper behavior in retail stores. First, this study sheds light on four emotional states to be considered when employing AI technologies in retail stores. Second, the research reports a significant relationship from interest and enjoyment to shopper attitude, and to behavioral and positive WoM intention (through attitude). Managerially, this study offers suggestions for retailers and marketers. To enhance the emotional shopping experience, AI technologies used in retail stores (1) should be emotion-aware by reading and evaluating consumer emotions, (2) should be useful by enhancing the utilitarian side of shoppers' attitude, for example by showing that every AI technology features have high utility value like saving time or facilitating transactions, and (3) should be joyful by enhancing the hedonic side of the shoppers' attitude, for example by keeping up with new trends.

References available upon request.