Generative AI chatbots and Customer Engagement: Does product type matter?

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Abstract

This study aims to investigate the impact of generative AI chatbots on customer engagement with online retailers, particularly by exploring how the effect of generative AI chatbots on perceived control varies depending on the product type. In the first study, we find a significant effect of the generative AI chatbot's presence on increasing customer engagement with the retailer. Conversely, when the generative AI chatbot is absent, customer engagement decreases. The second study reveals that cognitive and behavioral control mediate the impact of generative AI chatbots on customer engagement. This mediation occurs because providing customers with relevant information enhances their perceived cognitive and behavioral control, ultimately influencing their level of engagement with the retailer. In the third study, we observe significant moderated mediation effects of the generative AI chatbot on customer engagement, operating through cognitive and behavioral control. This effect varies with the type of product, with stronger effects observed for experience goods than for search goods. However, in our final study, we find the reverse effect: even when purchasing search goods, respondents show higher customer engagement with the retailer when generative AI chatbots are present in cases of choice overload.

Keywords: *Generative AI chatbot, product type, customer engagement*

Track: *Retailing and Omni Channel Management*

Introduction

The landscape of chatbots within the global market is forecasted to reach a substantial $3.99 billion by 2030. Existing research underscores the potential for chatbots to provide personalized recommendations in real-time, contributing to enhanced customer satisfaction (Solis-Quispe, Quico-Cauti, and Ugarte, 2021). While prior work scrutinized customer acceptance, satisfaction, and behavior related to chatbots, a deeper exploration into their influence on customer engagement throughout the shopping journey is needed, particularly within the context of online retail experiences. The main gaps center around how chatbots affect customer engagement and the role of product types in the effectiveness of chatbots. Additionally, in case of choice overload, how chatbots alleviate this burden is a key question to probe further.

1. Theoretical background and hypotheses development

1.1 AI chatbots in online retail

AI chatbots are chatting robots with sophisticated computer programs driven by AI technologies, (Mariani, Hashemi, and Wirtz, 2023). They are designed to engage in text-based conversations and provide automated assistance. In online retailing, chatbots are commonly employed as sales assistants that offer product recommendations and personalized shopping experiences (Chung, Ko, and Kim 2020). In our research, we concentrate on generative text-based chatbots because of their ability to produce original and contextually relevant responses, without relying solely on predefined patterns or rules (Kumar, Gupta, and Bapat, 2023). The generative pre-training transformer (GPT) architecture, developed by Radford et al. (2018), is a powerful model in natural language processing. Additionally, generative AI chatbots can mimic human-like conversations and adapt their language to match the user's tone and context (Korzynski, Mazurek and Ziemba, 2023).

1.2 Social response theory and uncertainty reduction theory

Social response theory (SRT) provides a framework for understanding how individuals engage in social behaviors and form connections in communication contexts. Past studies have applied SRT to show how individuals tend to respond to chatbots, by applying social rules and expectations, typically used in human–human interactions. Users frequently participate in intimate exchanges during computer-mediated interactions, willingly disclosing personal information (Moon, 2000). This suggests that chatbots foster a sense of social connection, transcending the notion of being a mere functional tool. Moreover, AI chatbots emerge as a tool for reducing uncertainty by providing relevant information and assistance (Skjuve, Følstad, and Brandtzaeg, 2022).

1.3 Customer engagement with the retailer

The focus on customer engagement has become increasingly important in relationship marketing

(Vivek, Beatty, and Morgan, 2012) and service-dominant logic (Brodie, Hollebeek, Jurić, and BIlić, 2011). Brodie et al. (2011) conceptualized customer engagement as a multidimensional construct that encompasses the customer's cognitive, emotional, and behavioral involvement. Customer brand engagement (CBE) has three dimensions—cognitive processing, affection, and activation (behavioral) (Hollebeek, Glynn, and Brodie, 2014). The cognitive processing pertains to the level of brand-related thought processing and elaboration that occurs during a customer's interaction with a brand. The emotional dimension of CBE represents the positive brand-related affect that a customer experiences during their interaction with a brand. Extending the concept of CBE by Hollebeek et al. (2014), we define customer engagement with the retailer as the level of cognitive, emotional, and behavioral involvement with the retailer.

1.4 AI chatbots and customer engagement

Generative AI chatbots have the potential to enhance customers' cognitive engagement by offering personalized recommendations and relevant content, promptly addressing customers' queries and concerns (Lin and Wu, 2023). Additionally, the presence of chatbots can also lead to affective engagement through engaging and personalized recommendations. The key element that contributes to this effect is the concept of contingency in the human–computer interaction through two-way personalized communication (Schuetzler et al., 2020). AI-powered chatbots can also enhance behavioral engagement by streamlining access to products, simplifying transactions, and incentivizing customers with exclusive offers or discounts (Campbell et al., 2020). We hypothesize:
H1: Generative AI chatbots increase customer engagement (affective, cognitive, and behavioral).

1.5 The role of control

Perceived control plays a vital role in the online landscape, characterized by technical complexity and data abundance. It empowers individuals to navigate technical intricacies and information overload. Two elements of perceived control can be used to predict people's tendencies and behaviors: cognitive control and behavioral control. If customers feel that they have both cognitive and behavioral control, they are more likely to form positive intentions and show higher engagement. Ultimately, interaction through the exchange of messages between customer and retailer increases the perceptions of control among customers (Liu and Shrum, 2002). Thereby, in this research, we propose two variables as potential mediators in the relationship between the presence of a generative AI chatbot and customers' responses: (1) cognitive control and (2) behavioral control.

1.6 Cognitive control and customer engagement

Averill (1973) defined cognitive control as the process of imposing meaning and reducing uncertainty. When customers converse with generative AI chatbots, it fosters a sense of interconnected interaction that elevates cognitive information processing. Therefore, as they receive relevant information and assistance about a given situation, customers perceive the situation to be much easier to understand and more predictable, leading to increased engagement with the retailer through the improved perception of cognitive control (Li and Shin, 2023).

1.7 Behavioral control and customer engagement

Behavioral control refers to perception of how easy or difficult it is to perform a particular behavior. Behavioral control shapes customer engagement by providing predictability, controllability, and desirable outcomes (Li, Xu, and Xu, 2018). Generative AI chatbots provide customers with timely and tailored information and assistance Click or tap here to enter text., which should enhance perceived behavioral control—or sense of having the tools and knowledge to make informed decisions and take desired actions. Thus, we hypothesize: *H2: Perceived control (cognitive and behavioral) mediates the effect of generative AI chatbots on customer engagement (affective, cognitive, and behavioral).*

1.8 Product type: search versus experience goods

Products can be divided into groups based on how thoroughly their attributes or qualities can be assessed either before or after purchase (Nelson, 1974). Search goods are those that have objective and easily identifiable attributes that can be evaluated based on their specifications. Conversely, experience goods have more difficult-to-evaluate attributes that can only be determined through the experience of using or consuming the product. Customers rely more on touchpoints for experience goods. One type of touchpoint that can be particularly effective for experience goods is chatbots as they provide extensive information (He and Zhang, 2022) and personalized assistance, helping customers feel more informed (Whang, Song and Choi, 2022). Since perceived informational complexity and risk associated with experience goods are higher (Girard and Dion, 2010), generative AI chatbots' influences on cognitive and behavioral control would be stronger. Consequently, it is hypothesized that: *H3: The type of product (search vs. experience) moderates the mediations of cognitive and behavioral control on the effect of generative AI chatbots on customer engagement such that the effect is stronger for experience goods than for search goods.*

1.9 Choice overload

Choice overload is primarily driven by the number of available options. Choice overload occurs when consumers struggle with an overwhelming number of available choices (; Mittal, 2016). Existing research has illustrated how larger assortment sets, in comparison with smaller ones, can amplify the complexity of decision-making. As the complexity increases, we anticipate that even for search goods, generative AI chatbots may contribute to alleviating the issue of information overload experienced by customers (Chen, Gong, and Tiang, 2022). Thus, building upon H3, we anticipate: *H4: Choice overload of search goods strengthens the effect of generative AI chatbots on customer engagement, while a limited number of choices weakens this effect. This relationship is anticipated to remain consistently strong for both small and large assortment sizes of experience goods.*

2. Methodology

2.1 Study 1: Direct effect of chatbots on customer engagement

The purpose of Study 1 is to verify the impact of generative AI chatbots on customer engagement (affective, cognitive, and behavioral). 120 US participants on Prolific took part in a between-subjects experiment (Generative AI chatbots: Generative bot vs. No bot). Three participants were removed due to failing the attention check, and the final sample was $N = 117$ (47% female; median age 41 years). The participants envisioned themselves shopping for perfume to wear at a formal wedding anniversary reception of a family member. They were tasked with choosing between two perfume options on the retailer's website. In the chatbot condition, participants were presented with a dialogue that they envisioned to be their own interaction with a chatbot in which they received product recommendations. In the non-chatbot condition, participants could only browse the website and read the products' information. After reading the scenario, participants assessed cognitive engagement (three items; $\alpha = 0.90$), affective engagement (four items; $\alpha = 0.94$), and behavioral engagement (three items; $\alpha = 0.93$) (Hollebeek et al., 2014). The manipulation for generative AI chatbots was successful ("I have received a recommendation from a chatbot"; MBot = 6.42, MNoBot = 1.47, [1, 115] = 774.469, $p < 0.001$). We verified the effect of chatbots on engagement (cognitive, affective, and behavioral). The generalized linear model test revealed a significant positive effect of chatbots on cognitive engagement (MBot = 5.62, MNoBot = 4.41, [1, 115] = 27.20, $p < 0.001$). The analysis of impact of generative AI chatbots on affective engagement yielded significant positive results (MBot = 5.65, MNoBot = 4.48, [1, 115] = 25.11, $p < 0.001$). The impact of generative AI chatbots on behavioral engagement was significant (MBot = 5.56, MNoBot = 4.06, [1, 115] = 32.29, $p < 0.001$). In summary, Study 1 supports H1.

2.2 Study 2: Mediating role of perceived control

The purpose of Study 2 is to investigate the mediating role of perceived control (cognitive and behavioral) on the relationship between chatbots and customer engagement. 246 US participants (51.2% female; median age 39.5 years) on Prolific took part in a between-subjects experiment (Generative bot vs. No bot). The participants were asked to imagine themselves shopping for a pair of pants for office wear in an online retailer, where a business-formal dress code is required. The two conditions were manipulated in a similar manner as in Study 1 and similar measures were used for cognitive engagement ($\alpha = 0.99$), affective engagement ($\alpha = 0.99$), and behavioral engagement ($\alpha = 0.97$) (Hollebeek et al., 2014). Then, we measured cognitive control ($\alpha = 0.98$) and behavioral control ($\alpha = 0.97$) and cognitive control ($\alpha = 0.98$) (McMillan and Hwang, 2002). The manipulation for generative AI chatbots was successful ($p < 0.001$). To test H2, we performed a mediation analysis using Hayes PROCESS macro (Model 4) with bootstrapping (5,000 bootstrap samples) and 95%

bias-corrected confidence intervals (CIs), with generative AI chatbots (dummy-coded: 1 = Bot, 0 = No Bot) as the independent variable; cognitive engagement, affective engagement, and behavioral engagement as the dependent variables; and cognitive control and behavioral control as the mediators. The effect of the chatbot on customer engagement was significant, directly affecting cognitive engagement ($b = 0.924$, $t = 3.243$, $p = 0.001$), affective engagement ($b = 0.714$, $t = 3.164$, $p = 0.001$), and behavioral engagement ($b = 0.569$, $t = 2.559$, $p = 0.011$). The indirect effect of generative AI chatbots on cognitive engagement was significant through cognitive control ($b = 1.307$, 95% CI = 0.036 to 2.633), and behavioral control ($b =1.468$, 95% CI = 0.121 to 2.567). Generative AI chatbots' impact on affective engagement was significant through cognitive control ($b = 1.553$, 95% CI = 0.494 to 2.358), and behavioral control ($b = 1.364$, 95% CI = 0.540 to 2.191). Lastly, in terms of behavioral engagement, generative AI chatbots' influence was significant through cognitive control ($b = 1.209$, 95% CI = 0.069 to 2.177), and through behavioral control ($b = 2.104$, 95% CI = 1.098 to 3.192). We thus find support for H2.

3.3 Study 3: The moderating role of the type of product

The purpose of Study 3 is to examine how the type of product moderates the mediation effect of perceived control in the relationship between generative AI chatbots and customer engagement. We recruited 425 US participants (50.4% female; M_{age}= 33 years) in Prolific to take part in a between-subjects 2 (Generative bot vs. No bot) × 2 (search vs. experience product) experiment. In the search condition, participants envisioned themselves searching for a dessert recipe book for making desserts for a special occasion, a formal wedding anniversary reception of a family member. In the experience condition, participants focused on shopping for a pair of pants intended for office wear, taking into account the business-formal dress code mandated by their office. The chatbot and no chatbot conditions were manipulated as in Studies 1 and 2. Then, after reading the scenario, participants responded to questions, using similar measures as in the previous studies for cognitive engagement ($\alpha = 0.99$), affective engagement ($\alpha = 0.98$), and behavioral engagement ($\alpha = 0.97$) (Hollebeek et al., 2014); and cognitive control ($\alpha = 0.98$) and behavioral control ($\alpha = 0.97$) (McMillan and Hwang, 2002). The manipulation for generative AI chatbots was successful ($p < 0.001$). Moreover, respondents in the search product condition perceived the search attributes to be higher ($p < 0.001$), while respondents in the experience product condition perceived the experience attributes to be higher ($p < 0.001$). Then, to test H3, we performed a moderated mediation analysis using Hayes PROCESS macro (Model 7) with bootstrapping (5,000 bootstrap samples) and 95% bias-corrected CIs, with generative AI chatbots (dummy-coded: 1 = Bot, 0 = No Bot) as the independent variable; cognitive engagement, affective engagement, and behavioral engagement as the dependent variables; cognitive control and behavioral control as the mediators; and product type (dummy-coded: 0 = Search, 1 = Experience) as the moderator. The moderated mediation model through cognitive control was supported for cognitive engagement (index = 4.812, 95% CI = 3.250 to 6.497), affective engagement (index = 2.904, 95% CI = 1.685 to 4.108), and behavioral engagement (index = 1.268, 95% CI = 0.240 to 2.343). The overall moderated mediation model through behavioral control was supported for cognitive engagement (index = 2.390, 95% CI = 0.739 to 3.962), affective engagement (index = 4.124, 95% CI = 2.894 to 5.344), and behavioral engagement (index = 6.012, 95% CI = 4.964 to 7.003). We, thus support H3.

3.4 Study 4: Conditional moderated mediation by number of choices

The purpose of Study 4 was to examine whether a choice overload situation during the purchase of search goods would reverse the previously identified pattern where individuals exhibited low engagement with the retailer when a chatbot was present but high engagement when the chatbot was absent when buying search goods. 493 US participants (50.4% female; Mage= 33 years) on Prolific took part in a 2 (generative AI chatbots: Generative bot vs. No bot) × 2 (product type: search goods (multivitamins) vs. experience goods (blazers)) × 2 (size of assortment: small (three options) vs. large (10 options)) between-subjects experiment. The chatbot and no chatbot conditions were manipulated as in previous studies. In the search goods condition, we introduced multivitamins as the search product and prompted respondents to envision a hectic lifestyle characterized by long working hours. In the experience goods condition, respondents were asked to imagine an upcoming business conference in Norway scheduled for November, requiring sophisticated attire that adhered to the conference's business-formal dress code. Subsequently, they decided to purchase a blazer. In both product types, participants faced different assortment sizes: small assortments with three options and large assortments with 10 options. After reading the scenario, participants evaluated cognitive engagement ($\alpha = 0.98$), affective engagement ($\alpha = 0.99$), and behavioral engagement ($\alpha = 0.98$) (Hollebeek et al., 2014); and cognitive control ($\alpha = 0.98$) and behavioral control ($\alpha = 0.96$). The manipulation for generative AI chatbots was successful ($p < 0.001$) as well as the manipulation for search versus experience goods ($p < 0.001$). Then, to test H4 we performed a conditional moderated mediation analysis using Hayes PROCESS macro (Model 11) with bootstrapping (5,000 bootstrap samples) and 95% bias-corrected CIs, with generative AI chatbots (dummy-coded: 0 = No Bot; Bot = 1) as the independent variable; cognitive engagement, affective engagement, and behavioral engagement as the dependent variables; cognitive control and behavioral control as the mediators; product types (dummy-coded: Search = 0; Experience = 1) as the moderator; and the size of assortment (small vs. large) as the conditional moderating variable. Overall, the conditional moderated mediation model, mediated by cognitive control and moderated by product types with different assortment sizes, received support for cognitive engagement with small assortments (index = 5.535, 95% CI = 4.104 to 6.872) and large assortments (index = 0.621, 95% CI = 0.244 to 0.994). Similarly, for affective engagement, the model was supported for small assortments (index = 4.740, 95% CI = 2.951 to 6.542) and large assortments (index = 0.532, 95% CI = 0.206 to 0.900). Lastly, for behavioral engagement, the model found support for small assortments (index = 4.716, 95% CI = 2.814 to 6.476) and large assortments (index = 0.530, 95% CI = 0.201 to 0.914). The moderated mediation model through behavioral control was supported for cognitive engagement (index = -2.238, 95% CI = -3.478 to -1.077), affective engagement (index = - 2.244, 95% CI = -3.867 to -.642), and behavioral engagement (index = -1.910, 95% CI = -3.577 to - 0.358). Finally, the conditional moderated mediation model, mediated by cognitive control and moderated by product types at different levels of choices, received support for cognitive engagement with small assortments (index = 2.418, 95% CI = 1.158 to 3.724) and large assortments (index = 0.180, 95% CI = 0.007 to 0.405). Similarly, for affective engagement, the model was supported for small assortments (index = 2.424, 95% CI = 0.695 to 4.161) and large assortments (index = 0.181, 95% CI = 0.003 to 0.437). For behavioral engagement, the model found support for small assortments (index = 2.064, 95% CI = 0.394 to 3.822) and large assortments (index = 0.154, 95% CI = 0.002 to 0.384). Thus, we validate H4.

3. Discussion

Our study extends the concept of customer engagement beyond traditional boundaries. Our research applies customer engagement to the realm of online retailers using generative AI chatbots and shows how they enhance the shopping experience by providing relevant information, which bolster a sense of cognitive control. Furthermore, AI chatbots enhance behavioral control, which is closely tied to self-efficacy. Overall, we show that an increased sense of perceived control with the assistance of generative AI chatbots, enhanced confidence and inclination to engage.

We also acknowledge the nuance of the relationship between generative AI chatbots and product type. Prior research (Xie, Yu, Zhang, and Chen, 2022) suggested that people perceive AI agents as struggling to grasp complex situations and lacking emotional understanding, making them less effective for experience goods. Differently, we reveal higher engagement with generative chatbots when purchasing experience products. This variance in findings could be attributed to the utilization of generative AI chatbots, the most advanced chatbot version, characterized as highly intelligent. Our study also highlights that when customers are presented with larger product assortments when purchasing search goods, the presence of generative AI chatbots enhance engagement. The indirect influence of generative AI chatbots on customer engagement with retailers, mediated through cognitive and behavioral control, is contingent on the product type.

From a practical standpoint, this study provides guidance for companies on how to implement generative AI chatbots selectively and effectively. Chatbots require substantial resources in terms of development, maintenance, and ongoing evaluation (Ma, Dou, Zhu, Zhong, and Wen, 2021). Thus, exploring the interaction between chatbot and product type is crucial. In the case of a company with a product portfolio mainly comprising search goods, it may be more effective to focus on making product descriptions clear and providing customers with important information. For experience goods, where the decision-making process is more complex, investing in chatbots can be valuable.

The limitation of this study is the use of a fictitious retail website, which may not accurately reflect real-world scenarios. Future studies could examine other types of online retailers or use real retailer websites and chatbots to produce more realistic externally valid contexts. Additionally, while the online questionnaire platform (Prolific) was used, it is possible that the participants do not accurately represent typical online shoppers. Furthermore, future studies could expand the scope to incorporate techniques like lab experiments involving advanced technologies such as Augmented Reality or Virtual Reality. Despite these limitations, this study highlights the importance for retailers of carefully considering the type of product when implementing generative AI chatbots as a means of enhancing customers' cognitive, affective, and behavioral engagement. By doing so, retailers can ensure that they are making informed and cost-effective decisions about the use of generative AI chatbots, which can be a significant investment for businesses.

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