# How Anthropomorphism And Initial Trust Shape Chatbot Customer Experience? The Moderating Role Of Technology Anxiety

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## ABSTRACT:

Based on the stimulus-organism-response (SOR) model, this study aims to investigate the effect of anthropomorphism and initial trust on customer experience. It also assesses the moderating effect of technology anxiety on the relationship between anthropomorphism and customer experience, which remains underexplored. Data were collected from 385 Tunisian students and analyzed using partial least squares structural equation modeling. Results indicate that anthropomorphism has a positive influence on both initial trust and customer experience, and that initial trust has a positive effect on customer experience. Findings also reveal that technology anxiety negatively moderates the relationship between anthropomorphism and customer experience. This study provides valuable insights for managers and system developers.

**Keywords:** Anthropomorphism, Initial trust, Technology anxiety, Chatbot customer experience, SOR Model

## INTRODUCTION

The rise of artificial intelligence (AI) has revolutionized the way companies interact with customers (Yatawara et al., 2025). Particularly, AI chatbots are performing the majority of consumer interactions over internet (Lu & Zhang, 2025), and redefining the customer experience (Chen et al., 2021). Chatbots, also known as virtual assistants, respond to customer inquiries, deliver 24/7 customer support, and enable human-like interactions (Li et al., 2023).

However, despite the significant progress in chatbot deployment, many consumers still express doubts and skepticism toward its usage (Pavone & Desveaud, 2024). They distrust chatbots (Maduku et al., 2025) and prefer human interaction (Gouveia & Santos, 2025). Therefore, the first interaction is prominent. It should feel helpful, clear and resembling human interaction to mitigate frustration. The implementation of anthropomorphic chatbots can be a potential solution to alleviate customer uncertainty and to make a better experience with the system (Sayed & Abutaleb, 2025). Anthropomorphic features of chatbot make people more reassured when interacting whith them, as they consider chatbots as human partners. However, the beneficial influence of anthropomorphism on customer experience may not hold for everyone. Technology anxiety might act as a key boundary condition that negatively moderate this effect. In addition, chatbots that appear excessively human might provoke the uncanny valley effects such as eeriness feelings, which in turn negatively affect trust (Song & Shin, 2024). Given this dual consequences of anthropomorphism, its ability to enhance engagement or trigger discomfort, we propose that initial trust should take precedence in chatbot development to mitigate Uncanny Valley effects and preserve the benefits of moderate anthropomorphism.

Despite the extensive prior literature on chatbot adoption, customer experience, which is an important outcome, should be thoroughly examined (Gouveia & Santos, 2025). Based on the stimuli-organism-response (SOR) theory, this paper aims to investigate an integrated framework combining anthropomorphism, initial trust, technology anxiety, and chatbot customer experience.

# LITERATURE REVIEW

## Stimulus-Organism-Response (SOR) theory

The SOR framework, proposed by Mehrabian and Russell (1974), proposes that external stimuli (S) can influence individuals' internal cognitions, feelings and emotions (O), leading to behavioral responses (R). The SOR is a relevant framework that explain individuals' experiences or behaviors in human–chatbot interactions (Truong & Chen, 2025). In this study, the SOR framework is applyed to illustrate how chatbot anthropomorphism (stimulus) can affect customer experience (response) through initial trust (organism).

Anthropomorphism can be defined as "the attribution of human characteristics or traits to nonhuman agents" (Epley et al., 2007). The anthropomorphic attributes of chatbots, such as language and design, are considered as stimuli since these external factors influence the perception and the interaction with chatbot. known as the "initial phase of customer trust relationship with a new technology" (Mostafa & Kasamani, 2022), initial trust is considered as the internal affective factor triggred by anthropomorphic features of the chatbot. Customer experience, conceptualized as "customers' subjective responses resulting from any contact with companies" (Martínez Puertas et al., 2024), constitutes the response component shaped during the interaction.

## Hypotheses development

### 2.1. Anthropomorphism and Chatbot initial trust

Anthropomorphism plays a pivotal role in facilitating the interaction with the chatbot and in enhancing trust (Yanxia et al., 2024). Individuals interacting with human-like conversational agent may exhibit a strengthened sense of social presence and trustworthiness (Shi et al., 2025). Thereby, anthropomorphic design elements elicit emotional responses such as comfort and psychological proximity, which can affect initial trust (Sfar et al., 2025).

H1. Anthropomorphism positively influences chatbot initial trust

### 2.2. Chatbot initial trust and experience with chatbot

Trust begins with initial trust, which is crucial for consumers lacking prior experience with the emerging technology (Lin & Lee, 2025). Initial trust is is instrumental in mitigating uncertainties and fostering consumer acceptance and adoption of chatbot (Sboui et al., 2024). When individuals manifest initial trust they are more likely to interpret ambiguous responses more charitably and to positively evaluate the interaction.

H2. Initial trust positively influences customer experience with chatbots

### 2.3. Anthropomorphism and experience with chatbot

Anthropomorphism is viewed as one of the key elements in establishing humanized interactions between conversational agents and customers (Sheehan et al., 2020). Human-like characteristics (e.g., use of dialectal language) enhance customers'satisfaction, help consumers establish an emotional relationship with the chatbot, and improve their overall experience (Rizomyliotis et al., 2022).

H3. Anthropomorphism positively influences customer experience with chatbots

### 2.4. Moderator role of technology anxiety

Technology anxiety refers to "the degree to which a person has difficulty or doubts in understanding and using new technology" (Meuter et al., 2003). It is considered as a stressor that lead to negative outcomes such as creepiness and distrust (Maduku et al., 2025). When confronted with a new technology (chatbots in this case), individuals are frustrated and skeptical since they do not fully understand and doubt the technology behind chatbots (Habib et al., 2025). The effect of anthropomorphism on customer experience can depend on customer's

anxiety levels. Individuals with low level of anxiety may benefit from the positive effects of chatbot anthropomorphism, be more cool, and evaluate positively the interaction. Conversly, users having a high level of anxiety perceive the same anthropomorphic characteristics, which should be reassuring, as a source of disconfort and creepiness. Despite its relevance, the moderator effect of technology anxiety remains underexplored.

H4. Technology anxiety negatively moderates the relationship between anthropomorphism and customer eperience
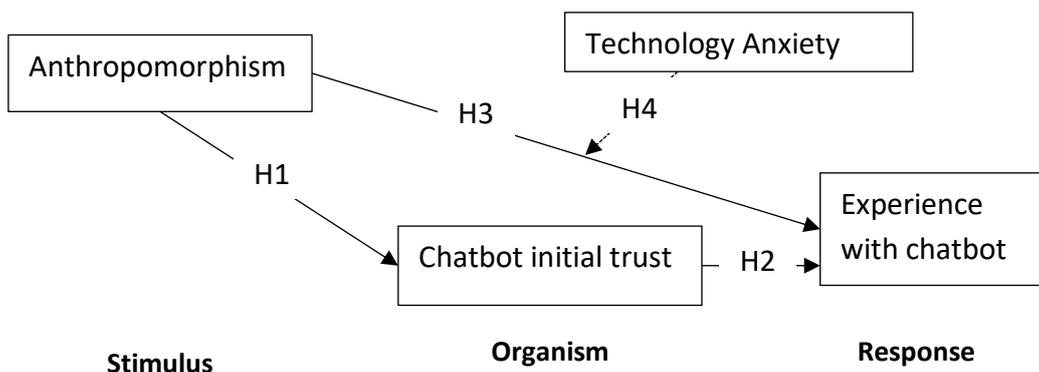
The conceptual model is presented in Figure 1



Figure 1. Conceptual model

## METHODOLOGY AND RESULTS

### Methodology

An online survey was administered to a sample of 385 Tunisian students aged between 20 and 23 years. The sample was composed of 77.9% females and 22.1% males. Participants were selected using convenience sampling method. All the measures included were a seven-point likert scales (1=strongly disagree; 7=strongly agree). They were adapted from the literature. The list of items is reported in the Table1.

### Results

To assess the hypotheses, a partial least squares structural modelling (PLS-SEM) approach throught Smart PLS 4 was applied. The results of the initial measurement model show that the item TA3 has a low factor loading (0.131), that is below the threshold of 0.7, so it was removed (Hair et al., 2019). All the composite reliability coefficients are above 0.7. Similarly the Cronbach's alpha coefficients exceed 0.7, indicating a good internal consistency. AVE coefficients surpass 0.5, indicating that the scales have good convergent validity (Henseler et al., 2016) (See Table 1). Finally, to examine discriminant validity, we referred to the HTMT matrix. It reveals the good discriminant validity of the constructs since all coefficients are below 0.9 (See Table 2). Before the assessment of structural model, multicollinearity was inspected. The examination of the variance inflation factors (VIF) showed that the VIF value of CIT4 is very high (27.856), inducing its suppression as recommended by Hair et al. (2021). As shown in the Figure 2, the values of $R^2$ are acceptable since they are higher than 0,2 (Hair et al., 2021). The hypotheses test results, illustrated in Table 3, indicate that all the hypotheses are significant and supported.

Table 1.Measurement model assessment

| Constructs | Items | Loadings | Cronbach's alpha | CR | AVE |
|---|---|---|---|---|---|
| Anthropomorphism (Mohammed & Ferraris, 2025) | | | 0.860 | 0.867 | 0.705 |
| ANTH1 | Chatbots communicate in a manner that feels authentic and not artificial | 0.847 | | | |
| ANTH2 | Chatbots exhibit human-like characteristics in their interactions | 0.880 | | | |
| ANTH3 | The interactions with chatbots feel realistic rather than mechanical | 0.847 | | | |
| ANTH4 | Chatbots engage users in a polished and natural manner | 0.780 | | | |
| Chatbot Initial Trust (Oliveira et al., 2014) | | | 0.898 | 0.900 | 0.777 |
| CIT1 | Chatbots seem dependable | 0.939 | | | |
| CIT2 | Chatbots seem secure | 0.904 | | | |
| CIT3 | Chatbots were created to help the client | 0.699 | | | |
| CIT4 | Chatbots seems trustworthy | 0.959 | | | |
| Experience with chatbot (Trivedi, 2019) | | | 0.940 | 0.941 | 0.892 |
| EWC1 | I enjoyed using (brand) chatbot | 0.944 | | | |
| EWC2 | The experience of using (brand) chatbot was interesting | 0.959 | | | |
| EWC3 | I am happy with the experience of using (brand) chatbots | 0.931 | | | |
| Technology Anxiety (Meuter et al., 2005) | | | 0.758 | 0.807 | 0.659 |
| TA1 | I feel apprehensive about using | 0.736 | | | |

| | | | | | |
|---|---|---|---|---|---|
| | technology | | | | |
| TA2 | Technical terms sound like confusing jargon to me | 0.845 | | | |
| TA3 | I have avoided technology because it is unfamiliar to me | delated | | | |
| TA4 | hesitate to use most forms of technology for fear of making mistakes I cannot correct | 0.849 | | | |
| | | | | | |

Table 2. Discriminant validity assessment

| | ANTH | CIT | EWC | TA |
|---|---|---|---|---|
| **ANTH** | | | | |
| **CIT** | 0.507 | | | |
| **EWC** | 0.605 | 0.599 | | |
| **TA** | 0.073 | 0.052 | 0.059 | |
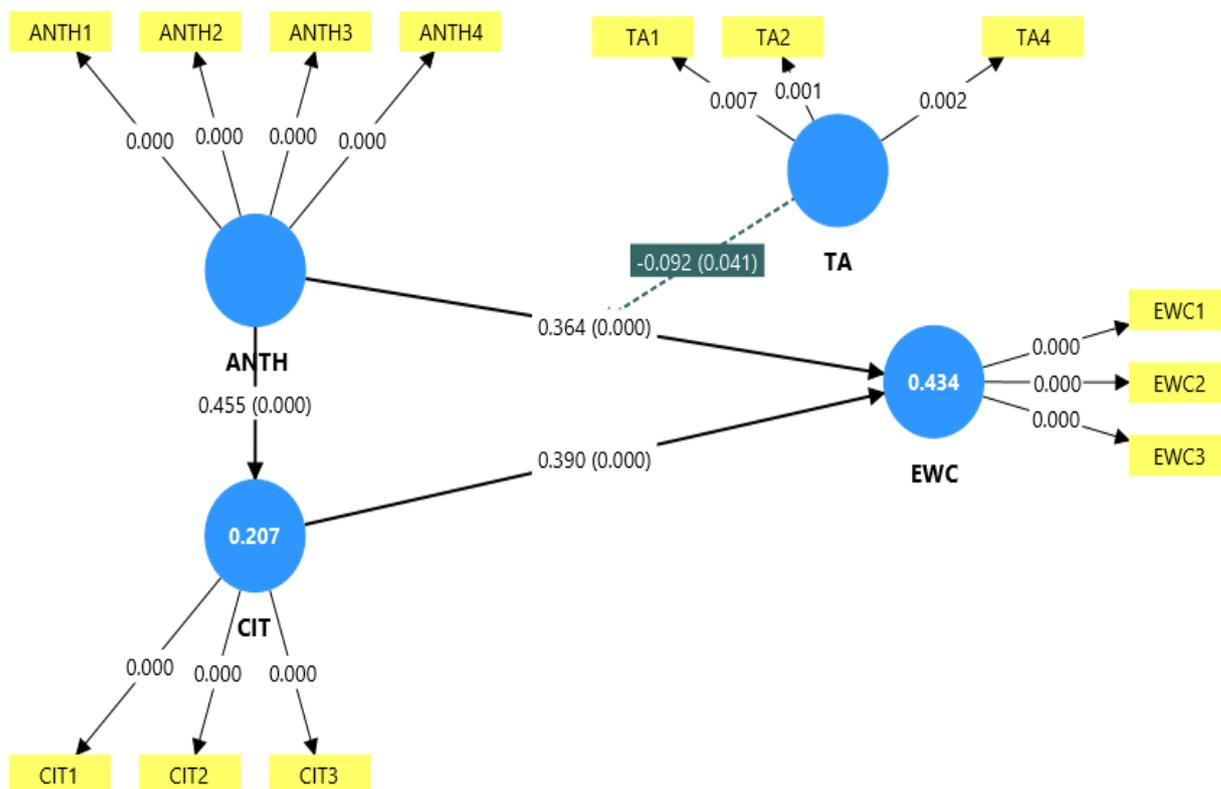


Figure 2. Structural model

Table 3. Hypotheses test results

| | Hypotheses | β | t-value | p-value | Conclusion |
|---|---|---|---|---|---|
| H1 | ANTH -> CIT | 0.455 | 9.967 | 0.000 | Supported |
| H2 | CIT -> EWC | 0.390 | 8.378 | 0.000 | Supported |
| H3 | ANTH -> EWC | 0.364 | 7.564 | 0.000 | Supported |
| H4 | TA x ANTH -> EWC | -0.092 | 2.045 | 0.041 | Supported |

## DISCUSSION AND MANAGERIAL IMPLICATIONS.

As mentioned above, all the assumptions are confirmed. First, anthropomorphism significantly and positively affect both initial trust and customer experience, corroborating the findings of Rizomyliotis et al. (2022) and Sfar et al. (2025). Chatbots having human-like traits enhance trust, engender enjoyable interactions leasing to favorable evaluations and pleasant experiences (Fotheringham & Wiles, 2023). Given that customers tend to trust technology more when it feels like talking to a person, not a machine, companies should add human-like features to their chatbots such as linguistic cues, and program them to respond with warmth and humor (Shams et al., 2024). Companies should also implement chatbots that provide customized interactions and proactive problem solving functionalities. Second, initial trust positively influences customer experience, confirming the findings of Sboui et al. (2024). This reveal the priority of the first touchpoint with customers. Establishing credibility early through testimonials can be a powerful solution to develop chatbot initial trust. Finally, findings indicate that technology anxiety negatively moderates the relationship between anthropomorphism and customer experience. Managers should incorporate technology anxiety as a key segmentation criterion in his strategies. For segments expressing high technology anxiety, managers should optimize chatbot design to mitigate their apprehension, customize interactions, and improve overall customer experience.

## CONCLUSIONS

This study used the S-O-R model to investigate the influence of chatbot anthropomorphism on customers' initial trust, and how this variable subsequently drive customer experience. Additionally, the results highlight the negative moderating effect of technology anxiety on the relationship between anthropomorphism and customer experience. This study address calls from Baabdullah et al. (2022) to test the technology anxiety as a key inhibitor in the experience with virtual agents.

This study encounter several limitatations. First, this study is made in Tunisian context, and more particular with a young generation. To improve its generalizability, future research should use larger and more diverse samples across cultures, age cohorts, and adoption contexts. Furthermore, a longitudinal study is recommended to investigate the evolving customer experience through repeated interactions with chatbots over time. Additionally, subsequent studies incorporating additional variables such as privacy concerns (Gouveia & Santos, 2025), perceived risk, and chatbots' communication quality Baabdullah et al. (2022) could strengthen the model's explanatory capacity. Lastly, more extensive empirical investigation of the uncanny valley phenomenon could help refine design guidelines that enhance user comfort and trust through appropriate human-like features.

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