



Degree Program: BI-Luiss Joint Master of Science in Marketing

Course of Understanding the Consumer

# **Augmented Intelligence vs. Anthropomorphic Chatbots: Improving Satisfaction in Angry Customer Interactions**

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## **i. Abstract**

Chatbots are increasingly used in customer service interactions. While many companies are looking to humanize these chatbots, previous studies find that having anthropomorphic features negatively affects satisfaction when customers enter the interaction in an angry state. This study uses a scenario-based approach to compare customer satisfaction between anthropomorphic chatbots and augmented intelligence – where a human agent is introduced during the conversation. Findings show that augmented intelligence significantly improves satisfaction for angry customers, but this is not the case when they are in a neutral state. These insights show the important role of genuine human empathy in managing angry customers. Practical implications include making chatbots more anthropomorphic, as this has increased customers' trust in the service, but introducing a human agent when customers are angry. Future research should examine the long-term impacts of augmented intelligence, its effects on employee well-being, and a cost-benefit analysis of its implementation compared to advanced chatbots.

*Keywords: Augmented Intelligence, Anthropomorphism, Chatbot, Customer Satisfaction*

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## 1.0 Introduction

Big leaps in artificial intelligence (AI) are making chatbots better and opening new doors to improve customer service interactions. The global chatbot market is expected to go up from \$4.7 billion in 2022 to \$15.5 billion by 2028 (marketsandmarkets, 2023), making more companies invest in them (Ramesh & Chawla, 2022). Getting a deeper understanding of how customers interact with chatbots is important since providing excellent customer service can save businesses millions or even billions (Hyken, 2023). Especially considering that approximately half of consumers feel frustrated during their interactions with chatbots, and 30% indicate a willingness to switch brands or share their negative experiences with friends and family (Press, 2023). The AI advancements have primarily focused on how to improve the cognitive aspects of customer interactions (Puntoni et al., 2021), but it is also important to consider the social elements to make a better customer experience (Lemon & Verhoef 2016). This is an area that requires more attention (Liu-Thompkins et al., 2022).

It is increasingly common to make the chatbots more human-like, which is known as an anthropomorphic chatbot. They have proven to lead to positive engagement (Epley et al., 2007) and increase perceived trust (Waytz et al., 2014). Even though these type of chatbots have benefits, they can sometimes backfire. When customers enter a chatbot interaction in an angry state, having anthropomorphic features leads to less satisfaction (Crollic et al. (2022). Given that one-fifth of every service interaction involves an angry customer (Grandey et al., 2004), this is a significant problem.

This human-like facade in anthropomorphic chatbots can give customers certain expectations about the performance. When the chatbot is more anthropomorphic, customers also expect the chatbot to show empathy like a human (Crollic et al., 2022). Since AI is perceived as less empathic than humans (Davenport et al., 2020), this results in expectancy violations and increased dissatisfaction (Sundar & Noseworthy, 2016). If customers are angry before an interaction, the expectancy violation leads to even worse negative reactions (Crollic et al., 2022).

Moreover, customers tend to be more forgiving when a human makes a mistake compared to when a machine does. Therefore, incorporating empathy might prove to be an effective strategy

compared to making the chatbot more human-like when dealing with angry customers (Chen et al., 2021). The concept of augmented intelligence can help reduce the negative effects of anthropomorphism in such situations. Augmented intelligence refers to AI complementing rather than replacing a human. In a service interaction context, this means introducing a human agent if the anthropomorphic chatbot senses that a customer is angry. The reason this might be better is that a human can offer the empathy and understanding that AI-driven chatbots alone often lack (Chen et al., 2021) and, therefore, improve customer satisfaction when customers are angry. Identifying this gap is important in a business context where customer satisfaction is essential and is a challenge for businesses wanting to improve customer service while leveraging AI.

AI is efficient and can help several people at the same time, but sometimes it can struggle with empathy. Since this is essential when solving angry customer complaints, this study's research question is: **Can augmented intelligence lead to better customer satisfaction compared to an anthropomorphic chatbot when customers enter the chatbot interaction angrily?** By investigating this question, the paper addresses an important gap in the current customer service landscape.

Using a scenario-based approach, this paper finds that augmented intelligence leads to significantly higher customer satisfaction compared to an anthropomorphic chatbot. This effect only happens when customers are angry, not when customers are in a neutral state. The findings are important for businesses that want to design the best possible service experience. Creating anthropomorphic chatbots has many benefits and is sufficient for most service encounters. But when customers are angry, they should be transferred to a human agent instead. By doing this, companies can provide the best possible customer experience while still leveraging AI.

Following this introduction, the subsequent chapters will delve into the literature on anthropomorphic chatbots and discuss the implementation of augmented intelligence.

## 2.0 Literature Review

### 2.1 Anthropomorphism

Anthropomorphism is making non-human entities more human by giving them human-like characteristics, intentions, motivations, and emotions (Epley et al., 2007). Making technology more human-like has been shown to increase customers' trust since it is perceived as more competent (Waytz et al., 2014). Additionally, anthropomorphic chatbots can increase purchase intentions (Yen & Chiang, 2021).

Talking to a human still feels more satisfying than interacting with chatbots (Wang et al., 2023). Therefore, Dwivedi et al. (2023) suggest businesses should look into making chatbots more human-like to enhance customer interactions. Such traits are becoming more valued in service interactions, especially when customers interact with chatbots (Flavián et al., 2022). Moreover, studies by Chen et al. (2023) show that anthropomorphic chatbots can improve user satisfaction, trust, and social presence. Building on these insights, Dwivedi et al. (2023) have also considered the impact on user experience and recommendation likelihood.

Yet, anthropomorphism isn't without its drawbacks. Puzakova and Kwak (2017) suggest that anthropomorphism can backfire in crowded places where customers prefer space to others. Additionally, when risky things like slot machines appear too human, they might seem riskier to people who already feel vulnerable (Kim & McGill, 2011). Moreover, in the gaming world, characters that are too lifelike can reduce the fun by taking the players' autonomy away (Kim et al., 2016).

Anthropomorphic chatbots can, according to some, evoke positive emotions (Chuah & Yu, 2021; Schuetzler et al., 2020; Soderlund et al., 2021), but they can also lead to negative emotional reactions among customers (Ciechanowski et al., 2019; Luo et al., 2019; Przegalinska et al., 2019). Crollic et al. (2022) compared anthropomorphic chatbots to non-anthropomorphic chatbots when customers entered the interaction in an angry state. When customers are angry before interacting with a chatbot, anthropomorphism has a negative effect on customer satisfaction (Crollic et al., 2022). The authors argue that this negative effect is driven by expectancy violation. I.e., the human-like qualities of the chatbot set high expectations that are not met during the interaction.

## **2.2 Expectancy Violations and Anger**

Before interacting with a product, brand, or company, customers form expectations about its performance. After using it, they compare the performance against their pre-expectations (Cadotte et al., 1987). An expectancy violation occurs when there is a gap between the actual service and what customers thought beforehand (Sundar & Noseworthy, 2016). This gap comes from either high expectations before the service or disappointing results after (Cadotte et al., 1987). Such violations can lead to dissatisfied customers (Oliver, 1980; Oliver & Swan, 1989), negative attitudes toward the company (Cadotte et al., 1987), and harm future purchasing decisions (Oliver, 1980; Cardello & Sawyer, 1992). If customers are angry when this violation happens, the negative reactions are significantly worse (Ask and Landström 2010).

The reason for this, according to the functionalist theory of emotion, is that anger has an evolutionary function that triggers quick decision-making and the use of heuristics to respond quickly to perceived threats (Bodenhausen et al., 1994). This emotion is used to confront challenges (Lerner & Keltner, 2000; Martin et al., 2000) or to seek retribution against those letting us down (Cosmides & Tooby, 2000). Anger gears us up to take action and be aggressive, unlike other emotions that may lead to inaction (such as sadness; Cunningham, 1988; Lench et al., 2016) or lack of aggression (Lerner & Keltner, 2000). Therefore, anger is a powerful driver of how customers respond when they feel disappointed after an expectancy violation (Crolic et al., 2022).

This explains why Crolic et al. (2022) found that angry customers interacting with an anthropomorphic chatbot (vs. non-anthropomorphic chatbot) are likelier to report lower customer satisfaction.

## **2.3 Artificial Empathy**

One reason for these results may be the lack of empathy. Customers trust AI less when tasks are perceived as subjective and requiring emotional understanding (Castelo, 2019). They are hesitant to use it for such tasks because they perceive AI as lacking the necessary affective abilities or empathy to solve these types of tasks (Davenport et al., 2020).

It is important to have empathy in technology-based services to create positive user experiences and user intentions (de Kervenoael et al., 2020). For instance in the healthcare sector, authors offer evidence for chatbots being effective in reducing anxiety and depression symptoms (Holohan & Fiske, 2021), whilst others doubt the possibilities of AI in healthcare. Minerva & Giubilini (2023) argue that it seems improbable AI will ever be able to demonstrate empathy with a patient or offer the same connection that a human doctor can. However, if the chatbots can demonstrate empathy in the future, it can result in enhanced satisfaction and improve positive word-of-mouth (Dwivedi et al., 2023). Furthermore, Dwivedi et al. (2023) found that empathy in chatbots must combine both competence and warmth. Providing competence is the easiest of the two, but the primary challenge still remains on how to make the chatbots demonstrate warmth (Dwivedi et al., 2023).

As mentioned, angry customers are less satisfied with anthropomorphic chatbots compared to chatbots without human-like qualities (Crollic et al., 2022). Liu-Thompkins et al. (2022) pointed out that simply mimicking human qualities is not enough to make people believe they can offer the same qualities as humans. Without including genuine empathy in AI, it can be perceived as inappropriate when angry customers seek understanding, thus leading to expectancy violations and more upset customers (Liu-Thompkins et al., 2022). That study also found that AI chatbots with higher levels of empathy were perceived as more human-like compared to those with lower empathy (Liu-Thompkins et al., 2022). Based on that, they want to create chatbots with genuine empathy that resonates with customers, which might be a more effective way to make AI more human in angry interactions.

However, one limitation of their study is that they assumed consumers knew they were interacting with an AI agent (Liu-Thompkins et al., 2022). The new EU AI Act set to enter into force in Q2-Q3 2024 states that users must be aware of any interaction with AI chatbots (Meier & Spichiger, 2024). Being aware of AI identity usually leads to negative consumer responses (Luo et al., 2019), and they are perceived as less empathic (Davenport et al., 2022). Another limitation of their study is that artificial empathy can lead to privacy concerns (Liu-Thompkins et al., 2022). They argue that AI needs additional information like voice or facial expression data to fully realize artificial empathy's potential to correctly assume consumers' emotional states. Even though this information is revealed when interacting with a human, a machine's permanent recording of such information might be perceived differently, and the dynamics of trust in these contexts could also be different (Liu-Thompkins et al., 2022).



Previous studies show that trust plays an important role when consumers look to adopt chatbots (Gatzioufa & Saprikis, 2022). In general, consumers tend not to trust AI as much as they trust human intelligence in some domains (Dietvorst et al., 2015; Bigman & Gray, 2018; Hidalgo et al., 2021). For example in the healthcare sector, individuals are reluctant to delegate important medical decisions to AI-based health services (Longoni et al., 2019). This aversion to AI also applies to other areas, such as self-driving cars (Bigman & Gray, 2020; Gill, 2020), hotels, restaurants, retail shops, or at home (Bigman & Gray, 2018; Castelo et al., 2019; Borau et al., 2021).

Since consumers tend to trust humans (vs. machines) more, combined with the difficulties and limitations of introducing artificial empathy in chatbots (Liu-Thompkins et al., 2022; Dwivedi et al., 2023), introducing a human when customers enter an interaction in an angry state might be a better option.

## **2.4 Augmented Intelligence**

Having AI chatbots provides efficiency, but the short- to medium-term impact on marketing effectiveness is less clear (Davenport et al., 2020; Guha et al., 2021). Companies often invest in chatbots even though consumers still prefer genuine interactions with human employees (Liu-Thompkins et al., 2022). The problem with AI-driven solutions is to convincingly mimic human empathy and emotional responsiveness. By not being able to do that, customers get less satisfied when they seek understanding and empathy (Castelo, 2019; Davenport et al., 2020).

Augmented intelligence (AuI) is when AI complements rather than replaces a human being (Longoni & Cian, 2022). This approach can lead to a better customer experience by leveraging the strengths of both. AI can use its efficiency to handle routine tasks so customers get fast responses, while the human agent can talk to customers in need of empathy and understanding. Longoni and Cian (2022) have tested this augmented approach and introduced the "word-of-machine" effect. This effect describes how trade-offs between hedonic and utilitarian attributes influence whether people prefer or resist AI-based recommendations over traditional human-based recommendations (Longoni & Cian, 2022). The effect arises from the general perception that AI and human recommenders have different levels of competence. Specifically, Longoni and Cian (2022) found that AI was better at recommending when the goal was utilitarian, and

humans were better at recommending when it was hedonic. However, when AI was augmenting humans in the recommendations, this "word-of-machine" effect was eliminated. This means AuI was as good as AI for utilitarian benefits and humans for hedonic benefits.

The "word-of-machine" effect is also relevant when customers enter a service interaction in an angry state. Anger triggers quick decision-making and often leads to aggressive behavior (Bodenhausen et al., 1994). When expectations are violated, such as when an anthropomorphic chatbot is unable to provide empathy, these reactions get even worse (Liu-Thompkins et al., 2022). Interestingly, consumers use more affective processing for hedonic products (Melnik et al., 2012; Klein & Melnik, 2016), and studies show that anger prompts more heuristic and spontaneous processing compared to other emotional states (Bodenhausen, 1993; Bodenhausen et al., 1994; Lerner et al., 1998; Tiedens, 2001). Therefore, the findings of Longoni and Cian (2022) are relevant in a scenario where customers are angry in a service interaction. Using the logic in the "word-of-machine" effect, an anthropomorphic chatbot failing to meet an angry customer's emotional expectations can lead to aggressive responses and dissatisfaction (Longoni & Cian, 2022; Crollic et al., 2022).

This study wants to counter this by using the AuI approach. The negative effects of anger in anthropomorphic chatbot interactions can be mitigated by introducing a human agent (Longoni & Cian, 2022). The findings of Chen et al. (2021) indicate that people forgive humans more than machines. Additionally, while empathy expressed by a human employee can reduce consumer anger and other adverse reactions to service failures, empathy from a machine does not have the same effect (Chen et al., 2021).

Introducing human empathy during an anthropomorphic chatbot interaction can help reduce customer anger and improve satisfaction. The "word-of-machine" effect is mitigated because human agents can deliver the empathy that AI-based systems lack and provide emotional understanding when customers are angry. Combining human empathy with AI efficiency offers a more balanced solution and will improve customer satisfaction.

## 2.5 Hypotheses

Building on the literature review, we hypothesize that:

**H1:** Augmented Intelligence will lead to higher customer satisfaction compared to Chatbot Anthropomorphism.

Although anthropomorphic chatbots improve engagement (Chen et al., 2023; Dwivedi et al., 2023), they can fail to meet customer expectations. This is because customers have higher expectations of the chatbot performing as well as a human, which leads to less satisfied customers when they are unmet (Sundar & Noseworthy, 2016). It is important to provide genuine empathy to get satisfied customers, which is the limitation of anthropomorphic chatbots (Liu-Thompkins et al., 2022). Integrating human empathy into AI-driven interactions can significantly enhance customer satisfaction (Chen et al., 2021; Liu-Thompkins et al., 2022). Since AuI has both the efficiency of AI and the human empathy, it could lead to higher customer satisfaction.

**H2a:** Augmented Intelligence will lead to higher customer satisfaction compared to Chatbot Anthropomorphism when customers are in an angry state.

When customers enter a chatbot interaction when they are angry, they require a different level of empathy and emotional understanding, which anthropomorphic chatbots struggle to provide (Crolie et al., 2022). Being angry before an expectancy violation occurs makes the customers even more angry (Ask and Landström 2010). Anger triggers rapid, confrontational responses to perceived threats or frustrations (Bodenhausen et al., 1994; Lerner & Keltner, 2000). AuI should mitigate these reactions by providing the empathy AI lacks, which is crucial in managing angry customers (Chen et al., 2021).

**H2b:** Customer satisfaction will be the same for Augmented Intelligence and Chatbot Anthropomorphism when customers are in a neutral state.

When customers are not experiencing heightened emotions, the human empathy might be less needed. In neutral emotional states, the primary factors influencing satisfaction may relate more to the efficiency and utility of the interaction rather than emotional understanding and empathy. Thus, in such scenarios, the advanced capabilities of AuI and purely anthropomorphic

chatbots may perform equally well in satisfying customers. This assumption is supported by research suggesting that AI can competently handle tasks and simple interactions when there is no need for emotional engagement (Longoni & Cian, 2022).

## 2.6 Conceptual Framework

As Crolig et al. (2022) suggest, making chatbots more anthropomorphic might work in most contexts, but it can fail when customers enter interactions in an angry state. Since it is still challenging to make chatbots empathic and convince customers they are, a better approach may be to augment AI by introducing a human agent when customers are angry. Crolig et al. (2022) compare an anthropomorphic vs. non-anthropomorphic chatbot when customers enter an interaction in an angry state. This paper extends these findings by comparing an anthropomorphic chatbot vs. augmented intelligence, with anger as a moderator. A human agent will take over during the conversation, and customers' states (angry vs. neutral) are primed before the interaction using a scenario-based approach. The conceptual framework looks like this:

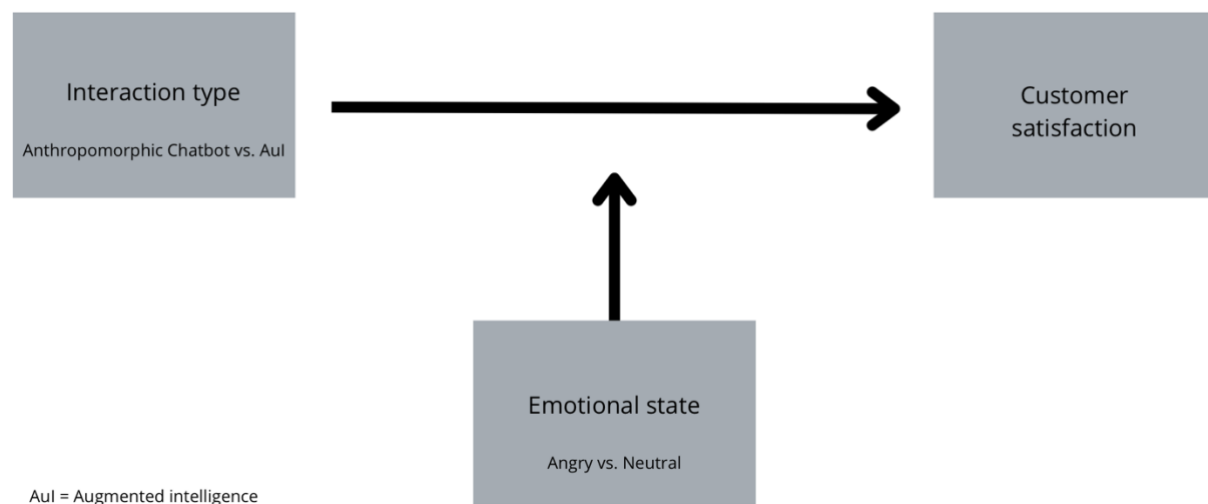


Figure 1: Conceptual Framework

## 3.0 Method

### 3.1 Research Design

A scenario-based study design was used to investigate the hypotheses in a controlled experimental setting, explicitly focusing on the impact of chatbot interactions on customer satisfaction when customers are angry. This study tested two primary conditions: chatbot anthropomorphism, which employs AI with human-like characteristics, and AuI, where a human agent is introduced into the chatbot interaction. Additionally, customer anger was manipulated to assess its influence on satisfaction.

### 3.2 Pretests

#### 3.2.1 Scenario

Two customer service scenarios (neutral vs. angry) were created for this study (see [Appendix A](#)). In the neutral condition, the participants read a scenario regarding an online laptop purchase. After the first use, the laptop quickly overheated. They checked the manufacturer's website and found they may need to return the laptop for repair or replacement. This process was expected to take longer than they thought, especially considering they needed the laptop for their studies. Despite their reluctance, they contacted the online customer chatbot service for assistance.

The anger condition was crafted to contain elements that evoke anger, such as a delayed laptop shipment, spending several hours diagnosing the issue, and stating they feel angry because they are falling behind on their studies. To verify that this scenario induced anger more than a neutral condition, a pretest was conducted on Prolific with 50 participants. They were randomly assigned to one of two scenarios and then asked to assess how angry the scenario would make them feel (“This situation would leave me feeling angry [frustrated],”  $r=.62$ ) on a seven-point Likert scale (1 = “not at all,” 7 = “extremely”). This method is adapted from Crollic et al. (2022). Equal variance was assumed since Levene's Test for Equality of Variances was insignificant ( $F(1, 49) = 3.04, p = .09$ ). The pretest confirmed that the anger scenario triggered angry emotions significantly more than the neutral scenario ( $M_{\text{Neutral}} = 5.40$  vs.  $M_{\text{Anger}} = 6.37; p = .002$ ). See [Appendix B](#) for results.

### 3.2.2 Anthropomorphic Chatbot

Both conditions (anthropomorphic chatbot vs. AuI) will interact with an anthropomorphic chatbot, with the difference being the introduction of a human agent for AuI. The chatbot introduced itself with a gender-neutral name: “Jamie, your customer service assistant,” and was given a gender-neutral avatar (made with DALL-E). Additionally, the chatbot consistently used singular first-person pronouns (i.e., “I”), which is proven effective in manipulating anthropomorphism in chatbots (Crolic et al., 2022).

To verify that the chatbot displayed anthropomorphic characteristics, we conducted a pretest on Prolific with 50 participants. Using a seven-point Likert scale, adapted from Epley et al. (2008), Kim and McGill (2011), and Crolic et al. (2022), participants evaluated the chatbot's human-like features. They rated these statements: "Please rate the extent to which Jamie: came alive (like a person) in your mind; has some humanlike qualities; seems like a person; felt human," achieving a high reliability ( $\alpha = .94$ ). A one sample T-test confirmed that the mean value was significantly higher than the midpoint ( $M = 4.56, p = .002$ ). See [Appendix C](#) for results.

### 3.3 Main Study Design

Two hundred and twelve participants (Male 43%,  $M_{Age} = 31.25$ ) from Prolific participated in this study in exchange for monetary compensation. They were randomly assigned to one of the four conditions in the 2 (scenario: neutral vs. anger) x 2 (conversation: chatbot vs. AuI) in-between subjects design. They first read the scenario (neutral or anger), then a conversation between a customer and an anthropomorphic chatbot or an anthropomorphic chatbot + human agent for the AuI condition (see [Appendix D](#)).

To ensure high-quality data, the questionnaire included a commitment request at the beginning of the survey as an attention check, which has proven to decrease the rate of quality issues more than other attention checks (Geisen, 2022). The commitment was labeled “Do you commit to providing thoughtful answers to the questions in this survey?” where only respondents that answered “Yes, I will” passed the attention check. The request came with an explanation that we cared about the quality of the survey data (Geisen, 2022). To ensure participants have read

and understood the scenario correctly, a comprehension check was also included after the scenario (“Which type of product is being talked about in this scenario?”) In accordance with the Prolific Comprehension Check Policy, participants were asked to reread the scenario if they were unsure and given two opportunities to answer the question correctly (Prolific, 2024).

After the chatbot interaction, participants evaluated their satisfaction by giving a star rating (a widely used measure of customer satisfaction; see Sun et al. (2007); Crolig et al., (2022)) from one to five stars across four categories: overall satisfaction, customer service, speed of service, and helpfulness ( $\alpha = .85$ ). Participants also provided their ages and gender before being thanked and concluding the study (see [Appendix E](#)).

## 4.0 Results

**H1:** *Augmented Intelligence will lead to higher customer satisfaction compared to Chatbot Anthropomorphism.*

An independent samples T-test was used to examine whether AuI will lead to higher customer satisfaction compared to an anthropomorphic chatbot. All two hundred and twelve participants passed the attention check and comprehension test. The test (see Table 1) confirmed a significant difference between the two conditions ( $p = .004$ ) on customer satisfaction (i.e., average star rating of the four dimensions), where participants in the AuI condition were more satisfied ( $M = 3.74$ ) than participants in the anthropomorphic chatbot-only condition ( $M = 3.41$ ), supporting H1.

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference
					One-Sided p	Two-Sided p		
Equal variances assumed	.001	.975	-2.897	210	.002	.004	-.32728	.11296
Equal variances not assumed	.001	.975	-2.897	209.648	.002	.004	-.32728	.11296

Table 1: Independent Samples t-test

**H2a:** *Augmented Intelligence will lead to higher customer satisfaction compared to Chatbot Anthropomorphism when customers are in an angry state.*

**H2b:** *Customer satisfaction will be the same for Augmented Intelligence and Chatbot Anthropomorphism when customers are in a neutral state.*

For H2, the study investigated the impact of chatbot anthropomorphism and AuI on customer satisfaction across different emotional states—neutral and angry. The analysis was conducted using two-way ANOVA to identify specific group differences. The test revealed a significant difference in customer satisfaction between the four conditions ( $F(3, 208) = 2.888, p = .037$ ) (see Table 2). The type of conversation (chatbot vs. AuI) was significant ( $p = .004$ ), while the scenario type (angry vs. neutral) and the interaction effect were not significant.

Tests of Between-Subjects Effects						
Dependent Variable: Avg. Satisfaction						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5.904	3	1.968	2.888	.037	.040
Intercept	2703.292	1	2703.292	3967.219	<.001	.950
Scenario Type	.004	1	.004	.006	.939	.000
Conversation Type	5.656	1	5.657	8.302	.004	.038
Scenario Type * Conversation Type	.226	1	.226	.332	.565	.002
Error	141.733	208	.681			
Total	2865.000	212				
Corrected Total	147.637	211				

Table 2: Tests of Between-Subjects Effects

The multiple comparisons (see Table 3) revealed that for participants entering the conversation in an angry state, AuI led to significantly higher satisfaction ( $M = 3.77$ ) compared to an anthropomorphic chatbot ( $M = 3.38, p = .015$ ), supporting H2a. Additionally, angry participants in the AuI condition had significantly higher satisfaction ( $M = 3.77$ ) than neutral participants in the chatbot condition ( $M = 3.45, p = .043$ ). However, the difference between the anthropomorphic chatbot and AuI condition was insignificant when participants were in a neutral state, supporting H2b. Interestingly, angry participants' satisfaction was directionally higher than the neutral participants in the AuI condition.



Multiple Comparisons						
(I) Combined_Scale	(J) Combined_Scale	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence	
					Interval Lower Bound	Interval Upper Bound
Neutral & Chatbot	Neutral & Aul	-.26171	.16118	.106	-.5795	.0560
Neutral & Chatbot	Angry & Chatbot	.07407	.16201	.648	-.2453	.3935
Neutral & Chatbot	Angry & Aul	-.31847	.15676	.043*	-.6275	-.0094
Neutral & Aul	Neutral & Chatbot	.26171	.16118	.106	-.0560	.5795
Neutral & Aul	Angry & Chatbot	.33578	.16428	.042*	.0119	.6597
Neutral & Aul	Angry & Aul	-.05676	.15911	.722	-.3704	.2569
Angry & Chatbot	Neutral & Chatbot	-.07407	.16201	.648	-.3935	.2453
Angry & Chatbot	Neutral & Aul	-.33578	.16428	.042*	-.6597	-.0119
Angry & Chatbot	Angry & Aul	-.39254	.15995	.015*	-.7079	-.0772
Angry & Aul	Neutral & Chatbot	.31847	.15676	.043*	.0094	.6275
Angry & Aul	Neutral & Aul	.05676	.15911	.722	-.2569	.3704
Angry & Aul	Angry & Chatbot	.39254	.15995	.015*	.0772	.7079

Table 3: Multiple Comparison

\* The mean difference is significant at the 0.05 level

## 5.0 Discussion

The findings of this study supported the prediction that AuI has a greater impact on customer satisfaction than chatbot anthropomorphism. This section will discuss these findings in relation to previous studies and theories predicted in the thesis introduction and literature chapters.

According to Crollic et al. (2022), increasing chatbot anthropomorphism can increase satisfaction in most scenarios, but it can be detrimental if customers are angry when they start the interaction. The study they conducted contrasted an anthropomorphic vs. non-anthropomorphic chatbot when customers started the interaction in an angry state. Because it remains difficult to make chatbots empathic and to convince customers they are (Davenport et al., 2020), this paper tested if a better strategy was to augment AI by inserting a human agent when customers are angry. This paper extends the finding of Crollic et al. (2022) by contrasting an anthropomorphic chatbot vs. AuI with anger as a moderator. A human agent was added

during the conversation, and customers' states (angry vs. neutral) were primed prior to the interaction using the scenario-based approach.

The significant main effect of conversation type shows that customer satisfaction was significantly higher when the interaction was handled through AuI compared to an anthropomorphic chatbot-only. This result aligns with hypothesis H1, indicating that augmenting human elements into AI-driven customer service could boost the overall customer experience.

The scenario (neutral vs. angry) did not significantly impact customer satisfaction on its own, even after successfully manipulating the emotional states in the pretest. This implies that whatever state the customers are in does not have a direct effect on their satisfaction. This result contrasts previous studies such as Crolig et al. (2022), which implied that customer emotional states could significantly affect their experience in an interaction with AI. However, this discrepancy may partly be due to the effectiveness of AuI in reducing angry emotions.

Although the scenario was insignificant, the difference between the "Angry & AuI" condition and the "Angry & Anthropomorphic Chatbot" condition was most significant. Previous studies, such as Chen et al. (2021), showed that human empathy is critical in regulating customer emotions, especially in angry interactions. This study extends these findings by empirically demonstrating that introducing human empathy results in higher satisfaction.

Making chatbots more anthropomorphic remains the right strategy due to its associated benefits. However, for companies that are looking to provide best customer service, introducing a human agent when customers are angry should result in higher satisfaction.

## **5.1 Theoretical Implications**

### **5.1.1 Expectancy Violations and Anger**

The findings from this study support the theoretical notion of expectancy violations when customers interact with anthropomorphic chatbots. As noted earlier, chatbots have the potential to violate customer expectations when they are interacting with anthropomorphic chatbots.

This is because customers' need for emotion and empathy might not be met by the chatbot (Davenport et al., 2020); Crolic et al., 2022). According to Sundar and Noseworthy (2016) and Crolic et al. (2022), this violation of expectations can lead to negative outcomes for companies. Customers might feel frustrated and angry. As shown in this experiment, the interaction with a human agent significantly improved satisfaction compared to the control condition. This finding indicates that human agents can mitigate expectancy violations by empathizing with customers and engaging them in a more personalized way.

### **5.1.2 Artificial Empathy**

Liu-Thompkins et al. (2022) argue that there is a lack of artificial empathy in chatbots. The current study supports this notion in that although anthropomorphism creates an illusion of interacting with a human, it is not effective when customers are angry and need emotional understanding. This happens regardless of the script for the two conditions being identical. Davenport et al. (2020) note that customers are reluctant to use AI technologies for emotionally laden tasks because they perceive AI technologies as lacking affective capabilities and empathy. The findings from this experiment suggest that human agents can overcome this gap in empathy and provide customers with more effective solutions compared to just anthropomorphism.

### **5.1.3 Augmented Intelligence**

This study finds that AuI improves satisfaction when customers are angry compared to an anthropomorphic chatbot-only. AI-powered chatbots are capable of handling routine and standardized tasks efficiently, but they do not provide empathy convincingly (Castelo, 2019). This leads to less satisfied customers when they are angry because they require empathy (Davenport et al., 2020). The idea behind AuI is that AI technologies should augment and support human capabilities rather than replace them (Longoni & Cian, 2022). This hybrid approach also leads customers to be less aggressive in their reactions (Chen et al., 2021). This paper demonstrated that human agents were able to provide genuine human empathy and overcome the limitations of anthropomorphic chatbots. This builds on the findings of Longoni and Cian (2022), who found that AuI can eliminate the "word-of-machine" effect when customers use hedonic and emotional processing (e.g., when they are angry).

## **5.2 Practical Implications**

The findings of this paper have significant implications for businesses developing customer service strategies. Since AuI leads to better customer satisfaction, it could be more beneficial to integrate a human agent in angry interactions compared to just relying on anthropomorphic chatbots. By doing this, companies can better manage angry customers and improve overall satisfaction.

The findings suggest that managers trying to give the best customer service possible should implement a human agent when customers are angry. Since the difference between AuI and an anthropomorphic chatbot was insignificant when customers were in a neutral emotional state, having an anthropomorphic chatbot should be sufficient and save money compared to having a human agent. It could also improve satisfaction if it is more efficient than a human since customers save time and prefer AI for utilitarian tasks (Longoni & Cian, 2022). If, however, the chatbot senses that the customers are angry, they should be transferred to a human agent. Even if chatbots can manage to give a high level of empathy in the future, human agents are still perceived as more empathic than chatbots (Davenport et al., 2022).

From a societal perspective, implementing AuI in customer services can lead to better customer experiences as it can reduce frustration and dissatisfaction. This can improve the overall customer relations and increase trust towards businesses that responsibly use AI technologies. Moreover, customers might end up more satisfied if they receive quick responses from an efficient AI chatbot for simpler and more utilitarian tasks while being empathized by a human when they are angry and unsatisfied with the chatbot.

## **5.3 Limitations and Future Research**

This study offers strong support for the proposed advantage of AuI, but it also has some limitations. Since the experimental design was controlled, the results could be different in a more complex and varied real-world situation. Furthermore, the transition from chatbot to human agent was designed to be seamless in this study. In practice, this handoff can be time-consuming and interrupted. Such interruptions can negatively influence customer satisfaction

since long waits might counteract the positive effect of adding a human agent and decrease the value of the intervention. Customers may also view the chatbot and the human agent as two separate contacts, which can influence their satisfaction scores since the first contact resolution is an important driver of customer experience (Hyken, 2023).

Additionally, the scenarios used in this study had ambiguous problem solutions, which means the customers' problem was only partly solved. Crolic et al. (2022) demonstrated that there was no difference between a control bot and an anthropomorphic chatbot when a problem was solved, in contrast to when the resolution was ambiguous. Future research could look at the effect of vague versus clear problem solutions on customer satisfaction between AI and AuI. By comparing resolved and unresolved problems, researchers can further pinpoint the specific circumstances under which AuI would be effective in reducing customer dissatisfaction.

Moreover, a full cost-benefit analysis of AuI versus anthropomorphic chatbots would benefit businesses. It would help identify the economic and operational cost trade-offs of adopting AuI or only chatbots and help firms make better decisions about where to invest based on efficiency, cost-effectiveness, and potential to increase customer satisfaction.

Longitudinal studies should be conducted to explore the long-term effects of AuI on customer satisfaction and loyalty. While this study offers evidence for the immediate improvement of customer satisfaction, it is crucial to understand how these findings persist over time. Longitudinal designs could follow customer interactions over the course of months or years to assess whether the initial benefits of AuI lead to long-term customer loyalty and positive business results. Such research could also explore if repeated exposure to anthropomorphic chatbots leads to higher perceived empathy and satisfaction since customers' reactions might vary due to familiarity with the technology.

Another important avenue for future research is to investigate how AuI influences employee's well-being and job satisfaction. While AuI can lead to better customer experiences, it is crucial to explore how it influences human agents when they interact with AI technologies, especially if their main interaction with the AI is when customers are angry and need human empathy. The stress from this emotional labor results in burnout and high employee turnover in customer service positions (Lee, 2015). Future research could investigate factors such as job stress, job satisfaction, and overall work environment when employees interact on a daily basis with AI

systems. Such knowledge can aid businesses in creating a good work environment that maximizes the potential of employees and customers. Addressing these research gaps will allow us to utilize AuI more effectively, improve interactions across different fields, and develop more satisfying and effective user experiences.

## **6.0 Conclusion**

This paper investigated whether augmented intelligence – where AI is used to complement rather than replace human interaction – can enhance customer satisfaction when customers start a chatbot interaction in an angry state. The results support the proposed advantage of AuI on customer satisfaction compared to an anthropomorphic chatbot. This effect was more pronounced when customers were angry since human empathy can better manage their emotions and meet their expectations. The findings support the theoretical notion of expectancy violations and artificial empathy in that anthropomorphic chatbots are limited in providing genuine and empathetic responses, especially when customers need emotional relief. The practical implications of this study add to the existing literature on human-computer interactions and emotional intelligence in AI technologies in that AuI can overcome the empathy gap in AI systems. For businesses, it is recommended that they invest in AuI systems and train human agents to interact effectively with AI when customers get angry. Moreover, companies can optimize customer service by adding a human agent to the flow of AI-powered customer service, which can improve customer satisfaction and maximize efficiency. Finally, future research should investigate the long term effects of AuI, explore how augmented intelligence influences employee's well-being, and do a cost-benefit analysis of implementing AuI versus anthropomorphic chatbots. Such knowledge can aid various domains in leveraging the full potential of augmented intelligence.

## 7.0 References

- Ask, K., & Landström, S. (2010). Why emotions matter: Expectancy violation and affective response mediate the emotional victim effect. *Law and human behavior*, 34, 392-401.
- Bigman, Y. E., & Gray, K. (2018). People are averse to machines making moral decisions. *Cognition*, 181, 21-34.
- Bigman, Y. E., & Gray, K. (2020). Life and death decisions of autonomous vehicles. *Nature*, 579(7797), E1-E2.
- Bodenhausen, G. V. (1993). Emotions, arousal, and stereotypic judgments: A heuristic model of affect and stereotyping. In *Affect, cognition and stereotyping* (pp. 13-37). Academic Press.
- Bodenhausen, G. V., Sheppard, L. A., & Kramer, G. P. (1994). Negative affect and social judgment: The differential impact of anger and sadness. *European Journal of Social Psychology*, 24(1), 45-62.
- Borau, S., Otterbring, T., Laporte, S., & Fosso Wamba, S. (2021). The most human bot: Female gendering increases humanness perceptions of bots and acceptance of AI. *Psychology & Marketing*, 38(7), 1052-1068.
- Cadotte, E. R., Woodruff, R. B., & Jenkins, R. L. (1987). Expectations and norms in models of consumer satisfaction. *Journal of Marketing Research*, 24(3), 305-314.
- Cardello, A. V., & Sawyer, F. M. (1992). Effects of disconfirmed consumer expectations on food acceptability. *Journal of sensory studies*, 7(4), 253-277.
- Castelo, N. (2019). *Blurring the line between human and machine: Marketing artificial intelligence* (doctoral dissertation). Retrieved from Columbia University Academic Commons. <https://doi.org/10.7916/d8-k7vk-0s40>.
- Castelo, N., Bos, M. W., & Lehmann, D. R. (2019). Task-dependent algorithm aversion. *Journal of Marketing Research*, 56(5), 809-825.
- Chen, N., Mohanty, S., Jiao, J., & Fan, X. (2021). To err is human: Tolerate humans instead of machines in service failure. *Journal of Retailing and Consumer Services*, p. 59, 102363.
- Chen, J., Guo, F., Ren, Z., Li, M., & Ham, J. (2023). Effects of anthropomorphic design cues of chatbots on users' perception and visual behaviors. *International Journal of Human-Computer Interaction*, 1-19.
- Chuah, S. H. W., & Yu, J. (2021). The future of service: The power of emotion in human-robot interaction. *Journal of Retailing and Consumer Services*, p. 61, 102551.
- Ciechanowski, L., Przegalinska, A., Magnuski, M., & Gloor, P. (2019). In the shades of the uncanny valley: An experimental study of human-chatbot interaction. *Future Generation Computer Systems*, 92, 539-548.

- Cosmides, L., & Tooby, J. (2000). Evolutionary psychology and the emotions. *Handbook of emotions*, 2(2), 91–115.
- Crolic, C., Thomaz, F., Hadi, R., & Stephen, A. T. (2022). Blame the bot: Anthropomorphism and anger in customer–chatbot interactions. *Journal of Marketing*, 86(1), 132–148.
- Cunningham, M. R. (1988). What do you do when you're happy or blue? Mood, expectancies, and behavioral interest. *Motivation and Emotion*, 12, 309–331.
- Davenport, T., Guha, A., Grewal, D., & Bressgott, T. (2020). How artificial intelligence will change the future of marketing. *Journal of the Academy of Marketing Science*, 48, 24–42.
- de Kervenoael, R., Hasan, R., Schwob, A., & Goh, E. (2020). Leveraging human-robot interaction in hospitality services: Incorporating the role of perceived value, empathy, and information sharing into visitors' intentions to use social robots. *Tourism Management*, 78, 104042.
- Dietvorst, B. J., Simmons, J. P., & Massey, C. (2015). Algorithm aversion: people erroneously avoid algorithms after seeing them err. *Journal of Experimental Psychology: General*, 144(1), 114.
- Dwivedi, Y. K., Balakrishnan, J., Baabdullah, A. M., & Das, R. (2023). Do chatbots establish “humanness” in the customer purchase journey? An investigation through explanatory sequential design. *Psychology & Marketing*, 40(11), 2244–2271.
- Epley, N., Akalis, S., Waytz, A., & Cacioppo, J. T. (2008). Creating social connection through inferential reproduction: Loneliness and perceived agency in gadgets, gods, and greyhounds. *Psychological science*, 19(2), 114–120.
- Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: a three-factor theory of anthropomorphism. *Psychological review*, 114(4), 864.
- Flavián, C., Pérez-Rueda, A., Belanche, D., & Casaló, L. V. (2022). Intention to use analytical artificial intelligence (AI) in services—the effect of technology readiness and awareness. *Journal of Service Management*, 33(2), 293–320.
- Gatzioufa, P., & Saprikis, V. (2022). A literature review on users' behavioral intention toward chatbots' adoption. *Applied Computing and Informatics*, (ahead-of-print).
- Geisen, E. (2022, August 4). *Improve data quality by using a commitment request instead of attention checks*. Qualtrics. <https://www.qualtrics.com/blog/attention-checks-and-data-quality/>
- Gill, T. (2020). Blame it on the self-driving car: how autonomous vehicles can alter consumer morality. *Journal of Consumer Research*, 47(2), 272–291.
- Grandey, A. A., Dickter, D. N., & Sin, H. P. (2004). The customer is not always right: Customer aggression and emotion regulation of service employees. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior*, 25(3), 397–418.



- Guha, A., Grewal, D., Kopalle, P. K., Haenlein, M., Schneider, M. J., Jung, H., ... & Hawkins, G. (2021). How artificial intelligence will affect the future of retailing. *Journal of Retailing*, 97(1), 28-41.
- Hidalgo, C. A., Orghian, D., Canals, J. A., De Almeida, F., & Martin, N. (2021). *How humans judge machines*. MIT Press.
- Holohan, M., & Fiske, A. (2021). “Like I’m talking to a real person”: exploring the meaning of transference for the use and design of AI-based applications in psychotherapy. *Frontiers in Psychology*, 12, 720476.
- Hyken, S. (2023). *Customer Service Can Make You Millions—Even Billions*. Forbes. <https://www.forbes.com/sites/shephyken/2023/03/12/customer-service-can-make-you-millions-even-billions/?sh=5c1435a71900>
- Kim, S., Chen, R. P., & Zhang, K. (2016). Anthropomorphized helpers undermine autonomy and enjoyment in computer games. *Journal of Consumer Research*, 43(2), 282-302.
- Kim, S., & McGill, A. L. (2011). Gaming with Mr. Slot or gaming the slot machine? Power, anthropomorphism, and risk perception. *Journal of Consumer Research*, 38(1), 94–107.
- Klein, K., & Melnyk, V. (2016). Speaking to the mind or the heart: Effects of matching hedonic versus utilitarian arguments and products. *Marketing letters*, 27, 131-142.
- Lee, D. (2015). The Philippines has become the call-center capital of the world. *Los Angeles Times*, 1.
- Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, 80(6), 69-96.
- Lench, H. C., Tibbett, T. P., & Bench, S. W. (2016). Exploring the toolkit of emotion: What do sadness and anger do for us?. *Social and Personality Psychology Compass*, 10(1), 11–25.
- Lerner, J. S., Goldberg, J. H., & Tetlock, P. E. (1998). Sober second thought: The effects of accountability, anger, and authoritarianism on attributions of responsibility. *Personality and Social Psychology Bulletin*, 24(6), 563-574.
- Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgement and choice. *Cognition & emotion*, 14(4), 473–493.
- Liu-Thompkins, Y., Okazaki, S., & Li, H. (2022). Artificial empathy in marketing interactions: Bridging the human-AI gap in affective and social customer experience. *Journal of the Academy of Marketing Science*, 50(6), 1198–1218.
- Longoni, C., Bonezzi, A., & Morewedge, C. K. (2019). Resistance to medical artificial intelligence. *Journal of Consumer Research*, 46(4), 629–650.
- Longoni, C., & Cian, L. (2022). Artificial intelligence in utilitarian vs. hedonic contexts: The “word-of-machine” effect. *Journal of Marketing*, 86(1), 91-108.

Luo, X., Tong, S., Fang, Z., & Qu, Z. (2019). Frontiers: Machines vs. humans: The impact of artificial intelligence chatbot disclosure on customer purchases. *Marketing Science*, 38(6), 937-947.

marketsandmarkets. (2023). *Chatbot Market*. MarketsandMarkets.

<https://www.marketsandmarkets.com/Market-Reports/smart-advisor-market-72302363.html>

Martin, R., Watson, D., & Wan, C. K. (2000). A three-factor model of trait anger: Dimensions of affect, behavior, and cognition. *Journal of Personality*, 68(5), 869–897.

Meier, Konrad., & Spichiger, Roger. (2024, March 15). *The EU AI regulation is coming. What does it mean for you and your business in Switzerland?* EY.

[https://www.ey.com/en\\_ch/forensic-integrity-services/the-eu-ai-act-what-it-means-for-your-business](https://www.ey.com/en_ch/forensic-integrity-services/the-eu-ai-act-what-it-means-for-your-business)

Melnyk, V., Klein, K., & Völckner, F. (2012). The double-edged sword of foreign brand names for companies from emerging countries. *Journal of Marketing*, 76(6), 21-37.

Minerva, F., & Giubilini, A. (2023). Is AI the future of mental healthcare?. *Topoi*, 42(3), 809-817.

Oliver, R. L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. *Journal of marketing research*, 17(4), 460-469.

Oliver, R. L., & Swan, J. E. (1989). Equity and disconfirmation perceptions as influences on merchant and product satisfaction. *Journal of Consumer Research*, 16(3), 372–383.

Press, G. (2023, February 1). *One Negative Chatbot Experience Drives Away 30% Of Customers*. Forbes.

<https://www.forbes.com/sites/gilpress/2023/02/01/one-negative-chatbot-experience-drives-away-30-of-customers/>

Prolific. (2024, May 8). Prolific's Attention and Comprehension Check Policy. Prolific.

<https://researcher-help.prolific.com/hc/en-gb/articles/360009223553-Prolific-s-Attention-and-Comprehension-Check-Policy>

Przegalinska, A., Ciechanowski, L., Stroz, A., Gloor, P., & Mazurek, G. (2019). In bot we trust: A new methodology of chatbot performance measures. *Business Horizons*, 62(6), 785-797.

Puntoni, S., Reczek, R. W., Giesler, M., & Botti, S. (2021). Consumers and artificial intelligence: An experiential perspective. *Journal of Marketing*, 85(1), 131-151.

Puzakova, M., & Kwak, H. (2017). Should anthropomorphized brands engage customers? The impact of social crowding on brand preferences. *Journal of Marketing*, 81(6), 99-115.

Ramesh, A., & Chawla, V. (2022). Chatbots in marketing: A literature review using morphological and co-occurrence analyses. *Journal of Interactive Marketing*, 57(3), 472–496.

Schuetzler, R. M., Grimes, G. M., & Scott Giboney, J. (2020). The impact of chatbot conversational skill on engagement and perceived humanness. *Journal of Management Information Systems*, 37(3), 875-900.

Soderlund, M., Oikarinen, E. L., & Tan, T. M. (2021). The happy virtual agent and its impact on the human customer in the service encounter. *Journal of Retailing and Consumer Services*, 59, 102401.

Sun, L. Y., Aryee, S., & Law, K. S. (2007). High-performance human resource practices, citizenship behavior, and organizational performance: A relational perspective. *Academy of Management Journal*, 50(3), 558-577.

Sundar, A., & Noseworthy, T. J. (2016). Too exciting to fail, too sincere to succeed: The effects of brand personality on sensory disconfirmation. *Journal of Consumer Research*, 43(1), 44–67.

Tiedens, L. Z. (2001). Anger and advancement versus sadness and subjugation: the effect of negative emotion expressions on social status conferral. *Journal of personality and social psychology*, 80(1), 86.

Wang, C., Li, Y., Fu, W., & Jin, J. (2023). Whether to trust chatbots: Applying the event-related approach to understand consumers' emotional experiences in interactions with chatbots in e-commerce. *Journal of Retailing and Consumer Services*, 73, 103325.

Waytz, A., Heafner, J., & Epley, N. (2014). The mind in the machine: Anthropomorphism increases trust in an autonomous vehicle. *Journal of Experimental Social Psychology*, 52, 113–117.

Yen, C., & Chiang, M. C. (2021). Trust me, if you can: a study on the factors that influence consumers' purchase intention triggered by chatbots based on brain image evidence and self-reported assessments. *Behaviour & Information Technology*, 40(11), 1177-1194.

## 8.0 Appendices

### 8.1 Appendix A – Scenarios

#### Neutral Scenario

Imagine you've recently purchased a new laptop online for your studies. Upon using the laptop for the first time, you notice it's quickly overheating. You check the manufacturer's website and find that you may need to send the laptop back for a repair or replacement. This process is expected to take longer than you thought, especially considering your need for the laptop for your studies. Despite your reluctance, you decide to contact the online customer chatbot service for assistance. You're determined to 1) solve the laptop's performance issue and 2) solve the delivery issue.

#### Angry Scenario

*The added text is in italics.*

Imagine you've recently purchased a new laptop online for your studies. *The laptop's delivery was delayed without a clear explanation, causing you to miss important deadlines.* Upon using the laptop for the first time, you notice it's quickly overheating. *Frustrated, you spend hours researching potential fixes online, without success.* You check the manufacturer's website and find that you may need to send the laptop back for a repair or replacement. This process is expected to take longer than you *can afford to wait*, especially considering your *immediate* need for the laptop for your studies. *You feel angry because you are already falling behind on your studies.* Despite your reluctance, you decide to contact the online customer chatbot service for assistance, *feeling frustrated and let down by the company.* You're determined to 1) solve the laptop's performance issue and 2) solve the delivery issue.

**Anger scale:**

	1. Not at all	2. Slightly	3. Somewhat	4. Moderately	5. Very	6. Highly	7. Extremely
This situation would leave me feeling angry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This situation would leave me feeling frustrated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**8.2 Appendix B – Anger vs. Neutral Pretest Results**

Group Statistics				
Group	N	Mean	Std. Deviation	Std. Error Mean
Anger	27	6.370	.850	.164
Neutral	24	5.396	1.260	.257

Group Statistics

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference
					One-Sided p	Two-Sided p		
Equal variances assumed	3.037	.088	3.270	49	<.001	.002	.975	.298
Equal variances not assumed		.088	3.198	39.651	.001	.003	.975	.305

Independent Sample T-test

### 8.3 Appendix C – Anthropomorphic Chatbot Pretest Results

<b>Group Statistics</b>				
	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error Mean</b>
<b>Composite Avg. Score</b>	50	4.560	1.334	.189

Group Statistics

Test value = 4					
Significance					
<b>Group</b>	<b>t</b>	<b>df</b>	<b>One-Sided p</b>	<b>Two-Sided p</b>	<b>Mean Difference</b>
<b>Composite Avg. Score</b>	2.968	49	.002	.005	.56000

One-Sample Test

## 8.4 Appendix D – Chatbot Conversation

### 8.4.1 Anthropomorphic Chatbot-only Conversation



***"Hello and welcome to our Customer Support Center! I'm Jamie, at your service. How can I assist you today?"***

Your response to Jamie: "I've recently bought a laptop from you, and it's overheating after 1 hour of use, making it run way slower."



***"I'm sorry to hear that, it sounds really frustrating. Let's sort this out as soon as possible. Could you please share your purchase reference number so I can look into this for you?"***

Your response to Jamie: "[Provides purchase number]"



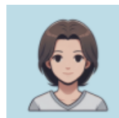
***"Thanks for that. It sounds like a serious issue, and we definitely want to address it promptly. Our usual procedure would be to have you send the laptop back for a thorough check-up and possible repair. This process usually takes about 2 weeks, would that be fine by you?"***

Your response to Jamie: "I really can't afford to be without my laptop for so long. I have important projects due soon. Is there any way to make the process go faster?"



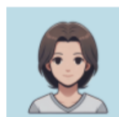
***"I've checked with our team, and the best we can do is to prioritize your repair as soon as the laptop arrives, cutting the wait time to about 10 days. I know that's still a bit longer than you'd hoped, and I wish we could do it faster. To make up for the trouble, how about a 20% discount on your next purchase from us? We'll send all the details to your email."***

Your response to Jamie: "I appreciate that effort, Jamie. It's still a bit long, but I'll manage. Thanks for the help."



***"Absolutely, I'm glad I could assist! I'll ensure everything is set up for your return and discount. You'll get an email soon with all the necessary steps. Is there anything else you might need help with today?"***

Your response to Jamie: "That will be all for now, thanks!"



***"You're welcome, I am glad I could help you! Thanks for reaching out to us, and I hope your issue gets resolved swiftly. Have a wonderful day!"***



## 8.4.2 Augmented Intelligence Conversation



***"Hello and welcome to our Customer Support Center! I'm Jamie, at your service. What can I help you with today?"***

Your response to Jamie: "I've recently bought a laptop from you, and it's overheating after 1 hour of use, making it run way slower."



***"I'm sorry to hear that, it sounds really frustrating. Let's sort this out as soon as possible. Could you please share your purchase reference number so I can look into this for you?"***

Your response to Jamie: "[Provides purchase number]"



***"Thank you. It sounds like a serious issue, and we definitely want to address it promptly. Our usual procedure would be to have you send the laptop back for a thorough check-up and possible repair. This process usually takes about 2 weeks, would that be fine by you?"***

Your response to Jamie: "I really can't afford to be without my laptop for so long. I have important projects due soon. Is there any way to make the process go faster?"



***"I understand your urgency. Please allow me a moment to connect you with a human specialist who might be able to find a quicker solution for you."***

***[A brief pause as the system transitions]***



**"Hello, I'm Robin, your customer service specialist. I've been informed about your laptop's speed issue and how critical it is for your studies. The best we can do is to prioritize your repair as soon as the laptop arrives, cutting the wait time to about 10 days. I know that's still a bit longer than you'd hoped, and I wish we could do it faster. To make up for the trouble, how about a 20% discount on your next purchase from us? We'll send all the details to your email."**

Your response to Robin: "I appreciate the effort, Robin. It's still a bit long, but I'll manage. Thanks for the help."



**"You're welcome, I am glad I could help you! Thanks for reaching out to us, and we will make sure that your issue gets resolved swiftly. Have a wonderful day!"**

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### 8.4.3 Anthropomorphic Scale

Please rate the extent to which Jamie ...

	1. Not at all	2. Slightly	3. Somewhat	4. Moderately	5. Very	6. Highly	7. Extremely
... came alive (like a person) in your mind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... has some humanlike qualities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... seems like a person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... felt human	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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## 8.5 Appendix E – Customer Satisfaction and Demographics

\*How would you rate...

	Very poor 	Poor 	Average 	Good 	Excellent 
... the overall satisfaction with the service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... the customer service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... the speed of service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... the helpfulness of the service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What is your age?

What is your gender?

- Male
- Female
- Prefer not to say
- I identify another way (write below)