

Chatbots vs. Human Agents: Emotional Aspects and Trust in Customer Service Interactions

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ABSTRACT

Many businesses use chatbots in customer service, but the question remains whether these digital assistants can provide the same level of personalized and empathetic service as their human counterparts. This study examined the differences in how chatbot and human interactions influence consumer trust, involvement, and purchase intention. Employing a 2x2 between-subjects factorial design, the study compared groups experiencing human communication and chatbot communication, utilizing emotional and factual interaction modes. The results revealed no significant differences among the groups concerning credibility, benevolence, ability, enduring involvement, situational involvement, and purchase intention, with the exception of integrity. Specifically, participants in the human-emotional group perceived communications as more honest and trustworthy compared to those in the chatbot-factual group. There was no interaction effect between the groups and trust concerning involvement and intention. This study supports the media equivalence framework and extends our comprehension of chatbots' effectiveness in customer service roles. The results indicate that chatbots have the potential to emulate human roles in e-commerce customer service effectively.

Keywords: Artificial Intelligence, Chatbot, Customer Service, Human-machine Communication

1. INTRODUCTION

Advances in artificial intelligence (AI) are predicted to significantly impact the labor market, as it holds the promise of automating tasks previously performed by humans [1]. Companies have started implementing chatbots that simulate human conversations using artificial intelligence to provide customer service [2]. A chatbot is a software agent that gives access to services and information through user interaction via text or voice using daily language [3]. Chatbots are expected to deliver satisfactory services to customers, offering companies new methods to reach and interact with them [4]. Consequently, various sectors such as retail, finance, information, and marketing have employed chatbots for customer service.

As companies increasingly interact with customers through live chat on their websites or social media platforms, chatbots are being more widely used in online services [5].

According to Markets & Markets, the chatbot industry is projected to grow from US\$4.7 billion in 2023 to US\$15.5 billion in 2028, reflecting a compound annual growth rate of 23.3% [6]. Many chatbot platforms are being deployed across various industries to replace human labor, promoting extensive research [7]. Chatbots are gaining traction in both practice and research because they can offer significant market opportunities while remaining cost-effective [8, 9].

Research on chatbots in marketing communication has shown their effects on information credibility [10], behavioral decision-making [11], behavioral intention [12], and purchase intention [13]. Despite abundant research, studies have not yet compared the emotional appeal of chatbots with that of human communication. The emotional aspects of chatbots are crucial for understanding robots' sensory engagement, social acceptance, and benefits for humans, forming critical parts of experiential communication research [14]. Furthermore, existing studies have primarily used cross-sectional surveys rather than experiments that ensure the internal validity of the results. Comprehending the differences between human and chatbot interactions, both factual and emotional, can provide insights into how consumers perceive chatbots in AI-mediated communication. Many researchers emphasize that the use of chatbots will not only yield economic benefits to businesses but also serve as a new viable service [15, 16]. Several researchers suggest that companies could leverage chatbots to enhance the efficacy of customer service [17, 18]. Therefore, it is crucial to investigate chatbots as an efficient technology with the potential to become an essential tool in e-commerce customer service.

Grounded in the theories of emotion and perceived understanding, disclosure, and equivalence frameworks, this study examined the influence of agent type (chatbot vs. human) and communication mode (emotional vs. factual) on evaluations of the experience, including trust, involvement, and purchase intention for the service. This study also explored the interaction effect between experimental groups and trust on engagement outcomes, including involvement and purchase intention. The analysis results may provide researchers and marketing professionals with valuable insights into the roles of chatbots and communicative trust within the rapidly growing AI industry. The effective role of chatbots in customer service indicates their potential as a viable technology that benefits both corporations and customers.

2. LITERATURE REVIEW

2.1 The role of emotions in commercial interactions

A distinctive query in AI communication is whether chatbots convey emotion. Emotion constitutes the essence of human nature and has been established as a legitimate area of scientific inquiry in marketing [19, 20]. In interpersonal relationships, emotions have a dynamic impact on the direct interaction between customers and employees, and the emotional state of customers and their perceptions of service are directly affected by

the emotional aspects of employees [21]. The model of emotional marketing proposed that emotional accounts of marketing messages trigger feeling responses [18]. Empathetic and warm communication generates consumers' positive feedback [22, 23]. The experience of emotional interaction likely motivates consumers' self-directed action. Although emotions can be exchanged briefly in interactive marketing, their duration can go far beyond the interactions [24]. For instance, in a service recovery process, both customers' short-term satisfaction or complaint behavior, as well as their long-term loyalty, are influenced by customer emotions [25]. Similarly, positive or negative emotions in service encounters may lead to positive or negative generalizations of service providers, their employees, and future encounters [26]. Furthermore, emotions that arise when interacting with customers in commercial interactions are important because they can directly impact business outcomes. Through either a chatbot or a person, consumers may demonstrate differences in response to emotional interactions. When consumers experience emotional conversations, trust may be built, leading to engagement and positive intentions [23]. Therefore, it is crucial for companies delivering customer service to comprehend the customers' emotions they serve.

2.2 Perceived understanding, disclosure, and equivalence framework

2.2.1 Perceived understanding framework

According to Reis et al. [27], when people feel understood by others, they tend to establish a psychological connection with that person and become more sensitive to their influence. On the other hand, misunderstood individuals are more likely to feel alienated and resist attempts to be interdependent or affected by the misconception [23]. The perceived understanding framework posits that the feeling of true understanding is not just an endorsement of the discloser's words but when the discloser feels that the partner understands who they are as someone and how they experience the core aspects of the world [28]. In a customer service context, customers know that the chatbot they are talking to is a computer program, not a human. As a result, the chatbots' responses are pre-programmed and seem dishonest, preventing consumers from believing that the chatbot understands them [28]. Customers who hold this perspective may be deprived of the positive emotional, relational, and psychological effects of understanding [28]. Similarly, customers may trust that human service providers can better understand them than chatbots, enhancing perceived understanding. Therefore, the emotional, relational, and psychological impact can differ when customers interact with human compared to chatbots.

2.2.2 Disclosure processing framework

The disclosure framework emphasizes the benefits that non-human partners can offer over human partners and suggests that individuals are likely to disclose more to chatbots, leading to more positive outcomes [28]. Fear of being rejected, judged, or burdening

listeners, along with concerns about unfavorable decisions, suppresses disclosure to others and prevents future benefits [29]. However, public intimacy can improve when the partner is a chatbot rather than a human since the individual understands that the computer cannot judge them [30]. People can more intimately disclose themselves to chatbots across various contexts, not just those heightening the fear of judgment [28]. Pennebaker and Chung [31] argue that articulating negative emotions and thoughts transforms them from raw emotions to cognitions, thereby reducing the strength and influence of negative feelings due to this transition [32]. Forming a narrative of the situation encourages new insights and removes ruminations about already bothersome items [31]. When coupled with a positive response from a partner, this interaction yields emotional, relational, and psychological benefits [33]. Due to increased public intimacy and cognitive re-evaluation, the emotional, relational, and psychological effects of information disclosed to a chatbot may show differences compared to disclosures made to humans.

2.2.3 Equivalence framework

Since humans tend to assign personality and human qualities to computers, they tend to respond socially to non-human entities [34]. A series of experiments involving individuals interacting with personal computers revealed such tendencies [35, 36]. People construct perceptions of chatbots and humans similarly while knowing that computers are devices with no human personalities [28]. Many studies have found individuals' proclivity to judge and react to computers in the same way they do to other people, as observed by various computerized agents, ranging from embodied conversational ones to robots and text-only chatbots [37, 38].

Nass et al. [39] introduced the experimental paradigm "Computers as Social Actor (CASA)" to provide evidence that computers elicit social responses in their human users. According to the CASA framework [40], individuals perceive, react to, and interact with computers in the same manner they do with others, often without conscious awareness. They argued that human users treated the computer as another social being, responding naturally and mindlessly [41]. Their founding indicated that computers and humans were equally effective at creating emotional, relational, and psychological benefits [41]. Today's computers are more advanced than in the past, and chatbots may be seen as social agents, as the CASA paradigm proposes. Because people experience chatbots similarly to how they experience discussion with humans without purposeful knowledge, this perspective argues that interaction outcomes will be comparable regardless of whether the partner is a human or a chatbot. Furthermore, this holds true not only when the partner is a computer but also when the partner is perceived to be a computer [42]. This supports the CASA's equivalence hypothesis that humans engage with chatbots psychologically as they interact with other humans.

2.3 Previous research

2.3.1 Chatbots for customer service

Customer service is defined as the supply of information, help, and support for an enterprise's customers [2]. Customer service can be planned to enhance user engagement with service providers and increase company revenue or merely provide users with the required help and information [43]. User experience is intimately linked to customer service performance, and inadequate customer service quality may lead to user dissatisfaction and a decline in customer retention. [44]. Customer service transforms from traditional manual service to automated service, which utilizes different technologies to achieve higher efficiency and quality [45].

Technological advancements are continuously transforming how companies interact with their customers; one clear illustration is the proliferation of customer service chatbots in the marketplace [46]. Researchers have forecasted that chatbots will become an essential part of customer service in the near future [47]. Since chatbots can understand why customers complain based on contextual understanding by recognizing and understanding customers' emotions [48], chatbots can be a method to supplement and replace human customer service staff [49]. Therefore, many researchers have identified chatbots as a new avenue for digital assistants in consumer services [6, 50]. In addition, chatbots enable an e-commerce environment that provides resources and improvement for viable customer service advantages [51]. Thus, this study examines whether chatbots compared to human communication work as a technology for customer service.

2.3.2 Trust and purchase intention

Trust is one of the key dimensions of customer service quality and plays a central role in building and maintaining successful consumer-brand relationships [52]. From a marketing perspective, Mou et al. [53] describe trust as the consumer's belief in the service provider's integrity, benevolence, ability, and predictability. Some researchers claim that if an agent of customer service is more humanlike, then a long-term trust relationship between the agent and the user is more likely to be established, referred to as a human-human perspective [54]. Other researchers assert that humans trust computerized systems more than other humans in customer service [55].

According to this view, humans are more likely to trust computer systems than other humans because we are supposed to be imperfect, but automation is not [55]. Lacity et al. [56] considered trust in technology critical for information technology (IT) acceptance at the user level. On that account, recent studies have focused on examining different aspects related to trust regarding chatbots [57, 58]. For instance, Følstad et al. [59] examined determinants for customer service chatbots from a user perspective. They identified the ability of the chatbot to correctly understand the user and provide effective advice as the key trust factor for successful customer service chatbots. Chung et al. [60] revealed that chatbots provided interactive and engaging customer service

encounters, and their communication preceded trust. Toader et al. [49] demonstrated that chatbots improve social awareness and cognitive capacity and subsequently lead to trust and favorable consumer responses. According to Hohenstein and Jung [61], since trust is an essential ingredient for successful relationships, it is essential to consider trust when testing the effect of chatbots. Trust often plays a catalyst role and is an influencing factor in predicting outcomes and customer experience. Trust has strengthened the relationship between learning about a product and product innovativeness [62]. Trust was a significant moderator between customer engagement and advocacy toward a service experience. When the service provider showed emotional empathy, customers with high trust were more likely than those with low trust to advocate for the service [63].

Earlier studies place trust as a precedent to behavioral intention [64]. Many researchers have studied the significance of trust and its essential role in online transactions and consumer behavior in generating desired positive outcomes. [65]. Trust affects intention directly and indirectly, and its indirect effect is through forming a positive attitude toward shopping online [66]. According to Kim et al. [67], trust plays a significant role in decision-making for customers who want to purchase some items online. Consumer trust has been shown to positively influence attitudes toward the company and increase willingness to purchase from the online vendor. [64]. Trust is also one of the most crucial variables influencing the intention to use chatbots for mobile shopping [57]. Wang et al. [5] found that the perceived usefulness of communication with chatbots positively influenced customer attitudes and trust and increased purchase intention. Chatbot interaction facilitated perceptions of trust, indicating that the interactions could be tailored to increase consumer purchase intention and satisfaction by maximizing emotion and rapport [13].

Trust in customer service can be divided into credibility, benevolence (kindness), integrity (honesty), and ability. Credibility is the extent to which a part of information is perceived as authentic and valid [68]. The attribution effect on information credibility has been recognized for a long time [69]. Researchers suggested that consumers would perceive product information correctly if they believed that the content of the information was caused by the product being explained [69, 70]. Trusted customer service providers are more likely to be perceived as providing customers with accurate and valuable information [71]. Therefore, trust is important to consumer's intention to use customer services [72, 73].

2.3.3 Involvement and purchase intention

Involvement is the degree of personal relevance and importance that customers attach to objects (e.g., products or purchase decisions) based on their needs, values, and interests [74]. Existing research classifies involvement into enduring involvement and situational involvement depending on the time course of involvement [75, 76]. Enduring engagement is related to a person's long-term interest in the target object [76]. Through long-term involvement, customers engage significantly with the product and

concentrate on the intrinsic satisfaction provided by the product rather than on the situation where they meet the product [20]. On the other hand, situational involvement is transitory and based on a temporary perception of the importance of a product in a particular purchasing situation [74]. Purchasing situations with high economic, temporal, and social risks lead to higher situational involvement [76]. Consumption-related uncertainty motivates customers to allocate more attentive resources to assess the situation [74].

Customer service creates comparable uncertainty for customers due to the lack of external price signals and can lead to opportunistic behavior regardless of the impact on the service provider [77]. Customers with highly enduring involvement are more likely to focus on intrinsic cues other than the value, such as customer service and their experience [78]. On the other hand, customers with a higher level of situational involvement are more inclined to focus on external cues such as quality of customer service [78]. Purchase intention is one of the most important variables in predicting future consumer behavior in business research, and it can be used to estimate actual purchase behaviors [76]. Researchers found that involvement affected customers' attitudes and behavioral intentions [67, 79]. Researchers agreed that involvement with a product or a service positively influenced purchase intention [76, 79].

Chatbots in varying fields dynamically recognize human feelings, understand user intent, and respond to user needs [80]. In marketing, a customer's involvement with a firm's chatbot can create loyalty and advocacy for the brand and make a source of marketing for the company [81]. Customer involvement with chatbots can facilitate the connection and interaction with the company and provide improved value to the customer through better customer service, availability, and personalized value propositions [82]. Therefore, the conversation generates users' involvement in AI-mediated communication. A chatbot tailored to matching consumer personality positively impacts consumer involvement [83].

Wang et al. [5] illustrated that the perceived usefulness of the involvement with a live chat assistant positively influenced customer attitudes and trust, as well as increased purchase intention. When consumers were involved in a live chatbot conversation to purchase a specific product, the experience positively influenced purchase intention for the product [84]. Halima et al. [85] suggested that a consumer's involvement with a chatbot is considered a determinant of their purchase intention.

2.3.4 Research questions

Based on the literature review, we established the following research question. As the three frameworks suggest, varying aspects of communication with chatbot and humans can lead to different outcomes. This study examines whether users' perceptions of chatbots and humans in emotional and factual communication differ in their impact on outcome variables. Additionally, this study explores the role of trust in the interaction process to determine whether it enhances or diminishes the experience.

Research Question 1 (RQ1). Do individuals exposed to chatbot (emotional vs. factual) communication, compared to those exposed to human (emotional vs. factual) communication, show significant differences in trust, involvement, and purchase intention?

Research Question 2 (RQ2). Do the chatbot/human and emotional/factual conditions interact with trust to influence involvement and purchase intention?

3. Methodology

3.1 Participants

The participants for this field experiment were recruited from universities in the Republic of Korea. Eighty-three college students participated in the study (male = 40, female = 43; M age = 22), and received compensation for their participation. Participants were excluded if they experienced technical problems that prevented them from participating in chat conversations for the entire duration ($n = 3$), if they failed to follow instructions ($n = 5$), or if research assistants reported major issues in the conversations ($n = 2$). Additionally, participants who expressed suspicions about the partners' identities or the purpose of the study were excluded. Some participants speculated about the study's purpose ($n = 2$), while others questioned whether their partner was human or a chatbot ($n = 6$). A power analysis, using a significance level of 0.05, F test, a priori, an effect size of 0.40, power of 0.80, and four groups, indicated that at least 73 participants were needed for acceptable results. The total sample size met this threshold from the power analysis [86].

3.2 Procedures

This study employed a 2x2 between-group factorial design experiment consisting of four conditions: 1) chatbot-emotional, 2) chatbot-factual, 3) human-emotional, and 4) human-factual. Participants were shown screenshots of a conversation between a customer and a customer service provider. Using the Wizard of Oz (WoZ) method [28, 87], participants were informed that the customer's conversation partner was a computer, although it was actually a human. This approach was necessary due to the limited capabilities of current chatbots to meet the study's conditions, as noted by Ho et al. [28].

A pseudo-experiment was conducted online, with participants assigned to one of the four conditions. Group 1 viewed a mobile phone screenshot of a chatbot-emotional interaction, Group 2 saw a chatbot-factual screenshot, Group 3 read a human-emotional interaction, and Group 4 considered a human-factual screenshot. Each group experienced different types of communication, with emotional interactions featuring empathic words from the Hoffman Feeling List [88], such as "We understand your concerns," while factual interactions provided objective statements like "Your question is under review." During the factual conversations, participants viewed the interactions without addressing feelings or emotions [89, 90].

After exposure to each condition, participants completed a post-experimental survey that included manipulation checks and measures of perceived trust, involvement, attitude, and purchase intention. The emotional communication focused on feelings, while the factual conversation addressed information objectively without emotional engagement.

3.3 Measurement instrument

We measured trust by dividing it into four components: credibility, benevolence, integrity, and ability [53, 69]. Involvement was assessed through enduring involvement and situational involvement [91, 92]. Lastly, we measured purchase intention [92].

Credibility. We assessed how credible participants felt their service partners were [69]. Responses ranged from “extremely” (5) to “not at all” (1). The Cronbach’s alpha for this scale across the four groups was 0.885.

Benevolence. Participants were asked to rate the benevolence of their service partners [53]. Responses ranged from “extremely” (5) to “not at all” (1). The Cronbach’s alpha for this scale across the four groups was 0.848.

Integrity. We measured participants’ perceptions of the integrity of their service partners [53]. Responses ranged from “extremely” (5) to “not at all” (1). The Cronbach’s alpha for this scale across the four groups was 0.839.

Ability. Participants were asked to evaluate how well their service partners performed their tasks [53]. Responses ranged from “extremely” (5) to “not at all” (1). The Cronbach’s alpha for this scale across the four groups was 0.808.

Enduring involvement. We assessed how likely participants were to continue receiving services from their service partners [91]. Responses ranged from “extremely” (5) to “not at all” (1). The Cronbach’s alpha for this scale across the four groups was 0.901.

Situational involvement. Participants were also asked about their satisfaction with the services provided by their service partners in specific situations [92]. Responses ranged from “extremely” (5) to “not at all” (1). The Cronbach’s alpha for this scale across the four groups was 0.785.

Purchase intention. We measured how likely participants were to purchase products based on customer service [92]. Responses ranged from “extremely” (5) to “not at all” (1). We also assessed participants’ inclination to purchase products with customer service [53] using the same response scale. The Cronbach’s alpha for this combined scale across the four groups was 0.949."

4. RESULTS

4.1 Perceived understanding framework

4.1.1 Emotional vs. factual

This study assessed manipulation during the experiment by evaluating whether participants accurately understood the conditions. Emotional and factual conversation conditions were validated by asking participants to evaluate the conversation [93]. Participants were asked to rate how much emotion the service provider conveyed to the customer on a scale from 1 (not at all) to 5 (a great deal). The four groups were recoded into factual (1) and emotional (2) categories. A t-test indicated a significant difference in emotional evaluations ($t = -3.65$, $p < .001$, $M_{\text{emotional}} = 3.02$, $M_{\text{factual}} = 2.07$), with the emotional group evaluating the experience more positively, confirming the intended manipulation.

4.1.2 Chatbot vs. human

Participants were asked if they believed they interacted with a chatbot or a human partner by answering: 1) Chatbot, 2) Human partner. A Chi-square test showed significant differences across the four groups, confirming subjects' understanding of the interaction type ($X^2 = 83.00$, $df = 3$, $p < 0.001$). Thus, the manipulation check was successful.

4.2 Chatbot analysis of research question

Research question 1 explored differences in mean scores for credibility, benevolence, integrity, ability, enduring involvement, situational involvement, and purchase intention across groups. ANOVA results indicated: credibility ($F = 1.41$, $p = 0.25$), benevolence ($F = 2.03$, $p = 0.12$), integrity ($F = 2.93$, $p = 0.04$, $\eta^2 = 0.08$), ability ($F = 0.66$, $p = 0.58$), enduring involvement ($F = 1.43$, $p = 0.24$), situational involvement ($F = 0.99$, $p = 0.39$), and purchase intention ($F = 1.13$, $p = 0.34$).

Table 1. Differences in each variable

Variable	Group (M, SD)				<i>F</i> (df)	<i>p</i>
	1 (<i>n</i> = 22)	2 (<i>n</i> = 20)	3 (<i>n</i> = 24)	4 (<i>n</i> = 17)		
Credibility	3.72 (0.97)	3.54 (0.76)	3.96 (0.73)	3.99 (0.71)	1.41	0.25
Benevolence	4.12 (0.71)	4.10 (0.73)	3.54 (1.16)	3.89 (0.92)	2.03	0.12
Integrity	3.89 (0.72)	3.38 (0.69)	3.92 (0.60)	3.69 (0.66)	2.93*	0.04
Ability	3.85 (0.76)	3.64 (0.72)	3.74 (0.64)	3.54 (0.80)	0.66	0.58
Enduring Involvement	3.54 (0.90)	3.40 (0.94)	3.15 (0.79)	3.67 (0.75)	1.43	0.24
Situational Involvement	3.32 (0.80)	3.42 (0.81)	3.14 (0.63)	3.51 (0.59)	0.99	0.39
Purchase Intention	3.50 (0.98)	3.33 (0.99)	3.06 (1.04)	3.57 (0.98)	1.13	0.34

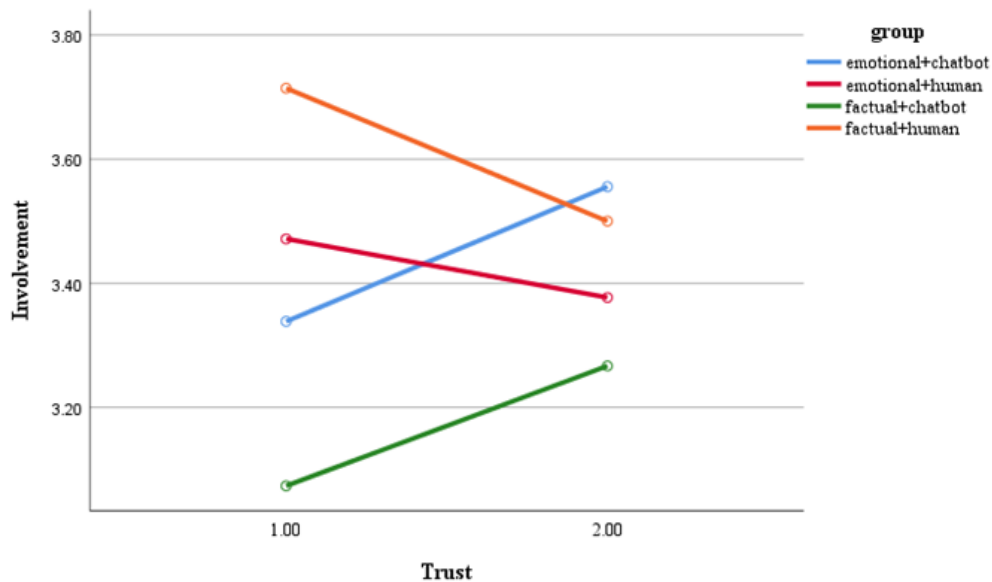
Note. Group 1: chatbot-emotional. Group 2: chatbot-factual. Group 3: human-emotional. Group 4: human-factual. * $p < .05$.

The human-emotional group scored significantly higher in integrity than the chatbot-factual group, suggesting participants viewed human communication as more honest. Post-hoc Tukey's HSD tests revealed this difference was statistically significant ($p = 0.037$), with no other comparisons reaching significance. Effect sizes (η^2) showed the integrity effect as moderate ($\eta^2 = 0.08$), while other variables indicated small effects ($\eta^2 < 0.02$). These findings suggest that while general trust perceptions do not vary significantly, the moral dimension of trust (integrity) is sensitive to agent type and communication mode.

Research question 2 examined whether there was an interaction effect between trust and the four groups on the variable of involvement. The four sub-variables of trust were combined into a single variable, with each value recoded as 2 if it was above the median and 1 if it was below the median. A two-way ANOVA was then conducted to investigate the interaction effects of the four groups and trust on involvement. As indicated in the analysis ($F = 0.42$, $p = 0.74$), there was no significant interaction effect between trust and the groups. However, as illustrated in the graph (Figure 1), chatbot groups with high trust tended to show higher levels of involvement. Nonetheless, the overall comparison among the groups did not reveal any significant differences. Research question 2 also inquired whether there was an interaction effect between trust and each group on intention. As shown in the analysis ($F = 0.91$, $p = 0.44$), there was no significant interaction effect between trust and the groups.

Table 2. Main and interaction effects of groups and trust on involvement

Source	Sum of Squares	DF	Mean Square	<i>F</i>	Sig.	E(MS)
Corrected Model	2.809 ^a	7	.401	.789	.599	.069
Intercept	899.400	1	899.400	1769.160	.000	.959
Group	1.953	3	.651	1.281	.287	.049
Trust	.012	1	.012	.025	.876	.000
Group*Trust	.647	3	.216	.424	.736	.017
Error	38.128	75	.508			
Total	986.190	83				
Corrected Total	40.937	82				

**Figure 1.** Interaction effects of groups and trust on involvement**Table 3.** Main and interaction effects of groups and trust on intention

Source	Sum of Squares	DF	Mean Square	<i>F</i>	Sig.	E(MS)
Corrected Model	2.809 ^a	7	.401	.789	.599	.069
Intercept	899.400	1	899.400	1769.160	.000	.959
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Error	38.128	75	.508			
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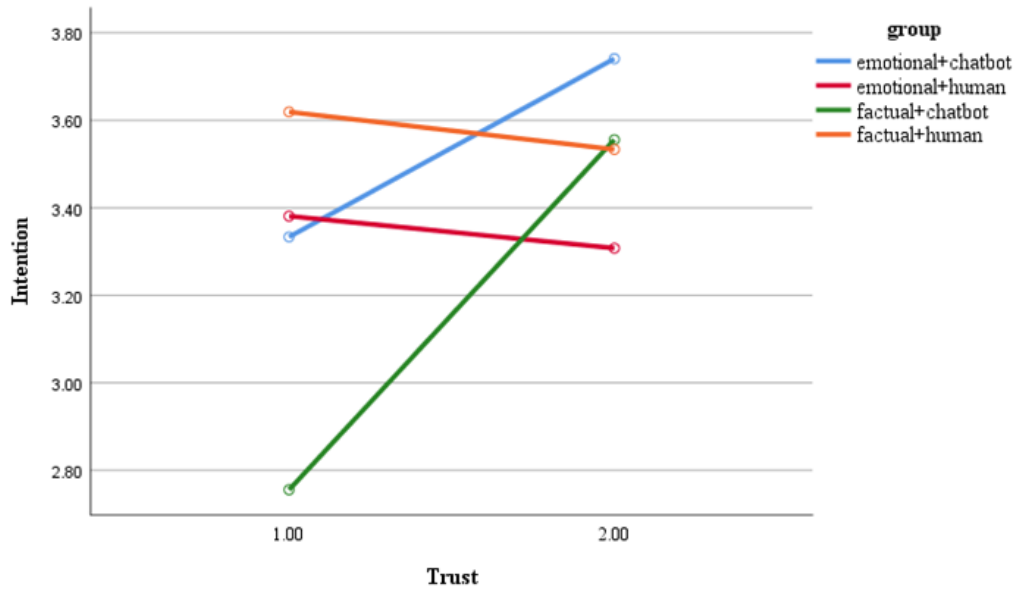


Figure 2. Interaction effects of groups and trust on intention

5. DISCUSSION

This study compared consumers' exposure to chatbot communication versus human communication under emotional or factual conditions, focusing on trust, involvement, and purchase intention. An interaction effect between chatbot-human communication and trust on involvement and purchase intention was also examined. The results revealed no significant differences in credibility, benevolence, ability, enduring involvement, situational involvement, or purchase intention among the groups. Participants did not distinguish between human and robot service providers, aligning with findings from previous studies. These studies have found that people instinctively perceive and respond to computers and engage with computer systems similarly to how they interact with humans [38].

From the results of this study, we can draw two interpretations. First, customers do not clearly or intentionally differentiate between the identities of their customer service providers when receiving service. Alternatively, customers may not be concerned about whether the customer service provider is human or non-human. Many studies indicate that people perceive computerized agents similarly to humans despite being aware that computers lack human personalities [28]. This tendency to judge and respond to computers as they do to humans has been documented in studies observing interactions with various types of computer agents [28, 38]. Consistent with these studies, we confirmed that the same applies to customers in a customer service context.

5.1 Theoretical and practical implications

The findings of this study contribute to the ongoing discourse on human-machine communication by providing empirical support for the equivalence framework (Computers as Social Actors, CASA) while also revealing nuanced distinctions in how

consumers interpret emotional and factual communication across human and chatbot agents. Consistent with prior research, the results indicate that people respond to chatbots in ways similar to human service providers, reinforcing the idea that individuals attribute social characteristics to non-human agents [34, 40]. This aligns with the CASA paradigm's assertion that humans interact with computers using social norms, even when they are aware that they are engaging with artificial entities [28, 41].

However, this study extends the equivalence framework by uncovering a key exception regarding perceptions of integrity. The finding that participants in the human-emotional condition perceived the interaction as significantly more honest and trustworthy than the chatbot-factual condition suggests that while chatbots can mimic human communication effectively, they still face limitations in conveying attributes related to moral character. This nuance challenges the assumption of full equivalence in human-chatbot interactions and indicates that emotional context interacts with agent type to shape specific dimensions of trust, particularly in areas where moral or ethical judgments are involved. Future refinements to the CASA paradigm should account for these domain-specific differences in social and ethical perception.

The study further contributes to the perceived understanding framework by demonstrating that consumers' trust and involvement levels remain consistent across human and chatbot interactions in emotional or factual contexts. This implies that perception of understanding might be functionally similar across agent types in shaping outcomes like purchase intention. This broadens the framework's scope by indicating technological mediation does not inherently weaken communication's relational impact if message content meets consumers' emotional and cognitive needs. Additionally, the findings raise questions about consumer feelings of safety or vulnerability with chatbots. Although individuals might disclose more to chatbots absent of human judgment, trust levels did not differ significantly, suggesting this benefit might not apply in commercial contexts where professional trustworthiness is critical.

Practically, businesses and chatbot developers must continue improving consumer interactions in both emotional and factual settings for success. Chatbots can achieve results akin to human agents in marketing communications, prompting companies to deploy them more in customer service to cut labor costs. This promise of higher profits through cost reduction is attractive to corporate leaders. However, companies and relevant government agencies should also prepare countermeasures for the problem of losing jobs in customer service by replacing human roles with chatbots.

To boost consumer trust, especially regarding integrity, chatbot designers should focus on transparent messaging and ethical communication cues (e.g., "I am here to assist you accurately and honestly"). Providing explanations on how chatbots make decisions or retrieve information can further strengthen trust in their integrity. Moreover, to simulate human-like emotional communication, chatbots should use emotionally intelligent algorithms that detect and respond to user sentiment with empathy. Tailoring responses based on emotional context, such as recognizing frustration with supportive messages,

can enhance user satisfaction and trust. For sensitive or high-stakes interactions, companies could adopt a hybrid approach where chatbots manage routine inquiries and escalate complex or emotional issues to human agents. This strategy optimizes efficiency while ensuring the emotional authenticity needed for intricate service situations.

5.2 Limitations and suggestions for future research

The study empirically shows that chatbots can emulate human service agents in many communication aspects; however, discrepancies regarding integrity-related trust suggest psychological limits on full equivalence. Future research should focus on minimizing these gaps by improving chatbot transparency and integrating moral language cues to enhance trust. Since the results were based solely on participants' sensory judgments, there may be errors that could lead to inaccurate conclusions. Additional tools, such as measures of recall and elaboration, are needed to assess participants' perceptions more precisely. Moreover, it is crucial to compare various types of customer service situations to gain a comprehensive understanding.

This study has several additional limitations. Firstly, all participants were college students, which means the results may not fully apply to the general public, limiting the study's generalizability. Additionally, using Wizard of Oz method is a limitation, as current chatbots do not yet function as ideal robots. The experiment also utilized pre-designed conversations, restricting participants from engaging in real-time interaction, which may have influenced or attenuated the results. In a more complex experimental setting, where participants interact with chatbots in real-time using random questions, different outcomes may arise. Future research should also aim to explore real-time interactions and their effects on user trust and engagement, as this could provide valuable insights into how spontaneous and dynamic conversations impact perceptions of chatbot integrity and effectiveness.

6. CONCLUSION

The results demonstrated that consumers' interactions with chatbots were comparable to their interactions with humans regarding involvement and purchase intention. This study supports the equivalence framework, which posits that people interact with computers similarly to how they engage with humans, often without conscious awareness. In straightforward interactions, chatbots can be as effective as humans. Thus, chatbots may be utilized in ecommerce as a viable technology. This study also indicates a potential increase in the use of chatbots for efficient e-commerce and online markets, reinforcing previous research that suggests chatbots can enhance the efficiency and effectiveness of customer service. Further investigations in various e-commerce settings are necessary to effectively assess the efficiency of chatbots.

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